



وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي
قسم الاعتماد

دليل وصف البرنامج الأكاديمي والمقرر

2023- 2024

المقدمة:

يُعد البرنامج التعليمي بمثابة حزمة منسقة ومنظمة من المقررات الدراسية التي تشتمل على إجراءات وخبرات تنظم بشكل مفردات دراسية الغرض الأساس منها بناء وصقل مهارات الخريجين مما يجعلهم مؤهلين لتلبية متطلبات سوق العمل يتم مراجعته وتقييمه سنوياً عبر إجراءات وبرامج التدقيق الداخلي أو الخارجي مثل برنامج الممتحن الخارجي.

يقدم وصف البرنامج الأكاديمي ملخص موجز للسمات الرئيسية للبرنامج ومقرراته مبيناً المهارات التي يتم العمل على اكسابها للطلبة مبنية على وفق اهداف البرنامج الأكاديمي وتتجلى أهمية هذا الوصف لكونه يمثل الحجر الأساس في الحصول على الاعتماد البرامجي ويشترك في كتابته الملاكات التدريسية بإشراف اللجان العلمية في الأقسام العلمية.

ويتضمن هذا الدليل بنسخته الثانية وصفاً للبرنامج الأكاديمي بعد تحديث مفردات وفقرات الدليل السابق في ضوء مستجدات وتطورات النظام التعليمي في العراق والذي تضمن وصف البرنامج الأكاديمي بشكلها التقليدي نظام (سنوي، فصلي) فضلاً عن اعتماد وصف البرنامج الأكاديمي المعمم بموجب كتاب دائرة الدراسات ت م ٢٩٠٦/٣ في ٢٠٢٣/٥/٣ فيما يخص البرامج التي تعتمد مسار بولونيا أساساً لعملها.

وفي هذا المجال لا يسعنا إلا أن نؤكد على أهمية كتابة وصف البرامج الاكاديمية والمقررات الدراسية لضمان حسن سير العملية التعليمية.

مفاهيم ومصطلحات:

وصف البرنامج الأكاديمي: يوفر وصف البرنامج الأكاديمي إيجازاً مقتضباً لرؤيته ورسالته وأهدافه متضمناً وصفاً دقيقاً لمخرجات التعلم المستهدفة على وفق استراتيجيات تعلم محددة.

وصف المقرر: يوفر إيجازاً مقتضباً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ويكون مشتق من وصف البرنامج.

رؤية البرنامج: صورة طموحة لمستقبل البرنامج الأكاديمي ليكون برنامجاً متطوراً وملهماً ومحفزاً وواقعياً وقابلاً للتطبيق.

رسالة البرنامج: توضح الأهداف والأنشطة اللازمة لتحقيقها بشكل موجز كما يحدد مسارات تطور البرنامج واتجاهاته.

اهداف البرنامج: هي عبارات تصف ما ينوي البرنامج الأكاديمي تحقيقه خلال فترة زمنية محددة وتكون قابلة للقياس والملاحظة.

هيكلية المنهج: كافة المقررات الدراسية / المواد الدراسية التي يتضمنها البرنامج الأكاديمي على وفق نظام التعلم المعتمد (فصلي، سنوي، مسار بولونيا) سواء كانت متطلب (وزارة، جامعة، كلية وقسم علمي) مع عدد الوحدات الدراسية.

مخرجات التعلم: مجموعة متوافقة من المعارف والمهارات والقيم التي اكتسبها الطالب بعد انتهاء البرنامج الأكاديمي بنجاح ويجب أن يُحدد مخرجات التعلم لكل مقرر بالشكل الذي يحقق اهداف البرنامج.

استراتيجيات التعليم والتعلم: بأنها الاستراتيجيات المستخدمة من قبل عضو هيئة التدريس لتطوير تعليم وتعلم الطالب وهي خطط يتم إتباعها للوصول إلى أهداف التعلم. أي تصف جميع الأنشطة الصفية واللاصفية لتحقيق نتائج التعلم للبرنامج.

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة: جامعة الفرات الاوسط التقنية

الكلية/ المعهد: كلية : الكلية التقنية الهندسية نجف

القسم العلمي: قسم هندسة تقنيات ميكانيك القوى

اسم البرنامج الأكاديمي او المهني: بكالوريوس هندسة تقنيات ميكانيك القوى

اسم الشهادة النهائية: بكالوريوس في هندسة تقنيات ميكانيك القوى

النظام الدراسي: سنوي - للعام الدراسي ٢٠٢٣-٢٠٢٤

تاريخ اعداد الوصف: 2023/6/8

تاريخ ملء الملف: 2024/6/8

التوقيع :
اسم المعاون العلمي:
التاريخ :

التوقيع :
اسم رئيس القسم:
التاريخ :

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي:

التاريخ

التوقيع

مصادقة السيد العميد

رؤية البرنامج

تتمثل رؤية القسم بخلق نظام تعليمي قائم على متطلبات و احتياجات المجتمع والمنشأة الخدمية الاخرى من التخصصات الهندسية التقنية بما يخدم التطور المدني المطلوب في البلد.

رسالة البرنامج

ان رسالة القسم ومنذ تأسيسه هو اعداد مهندس تقني قادر على ان يسر اغوار مجال التخصص متسلحاً بالمعرفة والمهارة والقدرة على مواكبة التطور, حريصا على اخلاقيات المهنة, ومتسما بالصفات القيادية ليتمكن من مواجهة التحديات وسد الطلب في سوق العمل وليسهم ايجابا في خدمة المجتمع ويكون عنصرا مهما في عملية بناء عراق افضل.

اهداف البرنامج

تقع الاهداف الرئيسية للقسم ضمن المحاور التالية:

- ❖ **المعرفة:** توفير المعرفة الاساسية في مبادئ الهندسة الميكانيكية عموما و هندسة السيارات بشكل خاص جنبا الى جنب مع المعارف اللازمة لدعم الرياضيات والحاسوب واساسيات الهندسة الميكانيكية لأعداد وتأهيل مهندسين متخصصين لتلبية متطلبات سوق العمل بقطاعيه الخاص والعام في الهندسة الميكانيكية من خلال التنوع في طرق التعلم والتعليم وتدريب الطلبة على تطبيق المعارف والمهارات المكتسبة لحل المشاكل الواقعية.
- ❖ **المهارات التقنية:** تطوير المهارات الاساسية اللازمة لتنفيذ وتصميم المشاريع المختبرية والميدانية من خلال تقديم برامج اكااديمية متميزة في مجال الهندسة الميكانيكية بشقيه النظري والعملية بحيث تتوافق مع المعايير العالمية للجودة الاكاديمية وتلبي حاجة سوق العمل.
- ❖ **مهارات الاتصال:** تطوير القدرة على تنظيم وتقديم المعلومات على نحو فعال سواء كان شفويا, او كتابيا او رسومات بيانية وتشجيع وتنمية البحث العلمي في مجالات الهندسة الميكانيكية بشكل عام.
- ❖ **التحضير للدراسات العليا:** توفير ما يكفي من اتساع وعمق لإنجاح الدراسات العليا اللاحقة ودراسة ما بعد التخرج وبرامج التعليم المستمر.
- ❖ **التحضير للمهنة:** بناء وتطوير الشراكة مع القطاعات الحكومية والاهلية والمجتمع بكافة مؤسساته المختلفة وتقديم تقرير مفصل للمشاكل التي تنشأ في الممارسات المهنية بما في ذلك العمل الجماعي والقيادة, السلامة المهنية, الاخلاق والاقتصاد.
- ❖ اعداد بيئة محفزة لأعضاء هيئة التدريس لتطوير معارفهم ومهاراتهم التعليمية والبحثية.

الاعتماد البرامجي

تقديم طلب الاعتماد البرامجي لتقرير التقييم الذاتي لقسم هندسة تقنيات ميكانيك القوى للعام الدراسي **2021/2022** الى رئاسة جامعه الفرات الاوسط التقنية.

المؤثرات الخارجية الأخرى

أجراء زيارات ميدانية وعلمية للمصانع والمعامل الموجودة في العراق

١) هيكلية البرنامج				
ملاحظات *	النسبة المئوية	وحدة دراسية ١٨٧	عدد المقررات ٣٨	هيكل البرنامج
	6.2 %	12	5	متطلبات المؤسسة
	25.2%	47	11	متطلبات الكلية
	68.4%	128	22	متطلبات القسم ٣٨
	-	-	-	التدريب الصيفي
	-	-	-	أخرى

* ممكن ان تتضمن الملاحظات فيما اذا كان المقرر أساسي او اختياري .



السنة المستوى	اسم المقرر أو المساق	رمز المقرر أو المساق	الساعات المعتمدة أسبوعيا			عدد الوحدات
			نظري	عملي	Tutorial	
الثانية	Mathematics 2		3	0	3	6
	Computer Applications 2		1	2	3	4
	Strength of Materials		2	1	3	5
	Automotive Electricity		2	3	5	7
	Mechanical Drawing		1	4	5	6
	Fluid mechanics and power system		2	2	4	6
	English Language		1	0	1	1
	Internal combustion Engines		2	2	4	6
	Automotive engine technology		2	4	6	8
Training						
السنة المستوى	اسم المقرر أو المساق	رمز المقرر أو المساق	الساعات المعتمدة أسبوعيا			عدد الوحدات
			نظري	عملي	Tutorial	
الثالثة	Computer Applications 3		1	2	3	4
	Eng. And Numerical Analysis		3	0	3	6
	Automotive electronics and computer controls		2	3	5	7
	English Language		1	0	1	1
	Machine design		2	3	5	7
	Measurements and control		2	2	4	6
	Theory of machines		2	2	4	6
	Vehicle Technology		2	4	6	8
	Heat Transfer		2	2	4	6
Training						

السنة المستوى	اسم المقرر أو المساق	رمز المقرر أو المساق	الساعات المعتمدة أسبوعيا			عدد الوحدات
			نظري	عملي	Tutorial	
الرابعة	Computer Applications 4		1	2	3	4
	Eng. Management and quality control		2	0	2	4
	fault diagnosis Advanced Automotive		2	3	5	7
	Theory of Vehicles		3	1	4	7
	Design of Automotive Components and System		2	3	5	7
	Vehicles Dynamics		2	0	2	4
	Advanced Automotive Technology		2	0	2	4
	English Language		1	0	1	1
	Project		0	6	6	4

مخرجات التعلم والتعلم والتقييم المتوقعة للبرنامج

أ) المخرجات المعرفية

- ١) القدرة على تطبيق المعرفة في الرياضيات والعلوم والهندسة.
- ٢) القدرة على تحديد وصياغة وحل المشكلات الهندسية.
- ٣) القدرة على استخدام التقنيات والمهارات والادوات الهندسية الحديثة اللازمة لممارسة الهندسة وتعليم مهارات القيادة والقيمة النوعية للالتزام والسلوك الأخلاقي واحترام الآخرين.
- ٤) القدرة على فهم المدونات التطبيقية الخاصة بالمهنة والمواصفات المهنية وفهم المسؤوليات المهنية والأخلاقية لحقل التخصص.
- ٥) القدرة على تقييم مخرجات المادة الدراسية مع الهيئة الدراسية والممارسين الصناعيين والمهنيين , فضلا عن ارباب العمل والطلبة الخريجين لتحسينها.

ب) المخرجات المهارية الخاصة بالبرنامج .

- ١) القدرة على الاشراف او تنفيذ اعمال الهندسة الميكانيكية بالعمل والاندماج في فرق متعددة الاختصاصات.
- ٢) القدرة على تحديد المشاكل الهندسية في حقل العمل و التفكير في معالجتها و التي تبرز اثناء تنفيذ الاعمال.
- ٣) القدرة على التصميم واجراء التجارب و تحليل وتفسير النتائج و كتابة التقارير العلمية وقراءة المخططات الهندسية.
- ٤) القدرة على مواكبة التطور في المواد الهندسية وطرق التنفيذ والقدرة على استخدام التقنيات الحديثة والمهارات والادوات الهندسية لممارسة الهندسة.

ج) المخرجات والأهداف الوجدانية والقيمية:

- ١) الاستجابة: متابعة مدى تفاعل الطالب مع المادة المعروضة على الشاشة.
- ٢) الانتباه: اثاره انتباه الطلبة وذلك من خلال الاسئلة خلال المحاضرة.
- ٣) الاهتمام: متابعة اهتمام الطالب الذي تفاعل اكثر مع المادة المعروضة.
- ٤) تكوين الاتجاه: بمعنى ان يكون الطالب متعاطفا مع العرض وربما يكون له رأي باتجاه الموضوع المعروض ويدافع عنه.
- ٥) تكوين السلوك القيمي: بمعنى ان يصل الطالب لقمة السلم الوجداني فيكون له مستوى ثابت في الدرس ولا يتكاسل ولا يتململ

د) المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).

- ١) تنمية قدرة الطالب على التعامل مع وسائل التقنية.
- ٢) تنمية قدرة الطالب على التعامل مع الإنترنت.
- ٣) تنمية قدرة الطالب على التعامل مع الوسائل المتعددة.
- ٤) تطوير قدرة الطالب على الحوار والمناقشة.
- ٥) القدرة على التصميم الميكانيكي باستخدام احدث برامج التصميم والمحاكاة ثلاثية البعاد وهي عملية لتلبية الاحتياجات المطلوبة ضمن حقل التخصص في اطار واقعي تفرض به القيود البيئية والاقتصادية والاجتماعية والسياسية والصحية.
- ٦) القدرة على العمل بأحدث اجهزة تشخيص الأعطال الميكانيكية والكهربائية والإلكترونية للمنظومات الميكانيكية والسيارات على وجه الخصوص.
- ٧) القدرة على التكيف مع جميع فروع الهندسة الميكانيكية والتكيف مع هندسة الاتصالات والطاقات المتجددة.

استراتيجيات التعليم والتعلم

- ١) الشرح والتوضيح عن طريق المحاضرات.
- ٢) التعلم الإلكتروني داخل الحرم الجامعي.
- ٣) طريقة عرض المواد العلمية بأجهزة العرض: داتا شو، سبورات ذكية، شاشات بلازما.
- ٤) التعلم الذاتي عن طريق الواجبات البيتية ومشاريع مصغرة ضمن المحاضرات.
- ٥) التعليم التطبيقي و التعليم التجريبي (المختبرات) والعمل ضمن مجاميع متعددة في ورش العمل.
- ٦) مشاريع التخرج ود راسة حالة(مشاريع التخرج) في تقديم وصف يشمل حقائق علمية حول مشكلة هندسية ويطلب من الطلبة تحليل بعض المعلومات ، وتشخيص المشكلة ووصف الحل الرياضي.
- ٧) الزيارات العلمية لمتابعة المشاريع المصممة في الهندسة الميكانيكية وتنظيم الزيارات الميدانية لحقل العمل.
- ٨) السمنارات التي تعقد في القسم.
- ٩) التدريب الصيفي والعمل مع مؤسسات الدولة الأخرى ضمن برنامج التدريب الصيفي.
- ١٠) الورش الهندسية والعمل ضمن مجاميع متعددة في ورش العمل.
- ١١) إثارة حوافز الطالب نحو الاجابة ونحو دراسة المزيد.

طرائق التقييم

- ١) الامتحانات القصيرة (كوز).
- ٢) الواجبات البيتية والالتزام بالموعد المحدد في تقديم الواجبات والبحوث المطلوبة من الطالب تقديمها..
- ٣) الامتحانات الفصلية والنهائية للمواد النظرية والعملية وتعتبر الاختبارات الفصلية والنهائية عن الالتزام والتحصيل المعرفي والمهارى.
- ٤) المشاريع الصغيرة ضمن الدرس.
- ٥) التفاعل داخل المحاضرة والمشاركة الفاعلة في قاعة الدرس دليل التزام الطالب وتحمله المسؤولية..
- ٦) التقارير.

الهيئة التدريسية (أعضاء هيئة التدريس)

اعداد الهيئة التدريسية		المتطلبات/المهارات الخاصة (ان وجدت)	التخصص		الرتبة العلمية
محاضر	ملاك		خاص	عام	
	٣		حراريات	ميكانيك	استاذ
	١		ميكانيك مواد	ميكانيك مواد	استاذ
	٤		حراريات	ميكانيك	استاذ مساعد
	١		ميكانيك تطبيقي	ميكانيك	استاذ مساعد
	١		تاريخ حديث وسياسي	تاريخ حديث ومعاصر	استاذ مساعد
	٤		تطبيقي	ميكانيك	مدرس
	١		التحليل العقدي	رياضيات	مدرس
	١		مواد	ميكانيك	مدرس
	٣		حراريات	ميكانيك	مدرس
	١		الادب الإنكليزي	انكليزي	مدرس مساعد
	١		قدره كهربائية	كهرباء	مدرس مساعد
	٧		حراريات	ميكانيك	مدرس مساعد
	٣		مواد	ميكانيك	مدرس مساعد

التطوير المهني

❖ التطوير المهني للطالب

يتم من خلال اكتساب الطالب مهارات التعلم الذاتي من خلال طبيعة المفردات والمناهج الدراسية وطرق التدريس المعتمدة وتشجيع الطلبة على العمل كفرق عمل ضمن مشاريع عملية تعكس الواقع الحياتي للمجتمع ومشاكله. وتشجيع الطلبة على

الدخول والمشاركة في المسابقات والندوات والمؤتمرات والتي تنمي وتطور قابليته البحثية وثقته بنفسه على التعلم الذاتي.

❖ التطوير المهني لأعضاء هيئة التدريس الجدد

من مهام قسم هندسة تقنيات ميكانيك القوى إقامة برامج تدريبية للمنسوبيين الجدد وبشكل دوري ولفترات مناسبة تتناسب مع استراتيجيات التدريس في قسم هندسة تقنيات ميكانيك القوى مع الأنواع المختلفة من نواتج التعلم التي تهدف لتطوير البرنامج التعليمي ويكون الكادر التدريسي في القسم ملزم باستراتيجيات التدريس والتقييم المنصوص عليها صراحة في توصيفات المقررات والبرامج مع وجود المرونة الكافية لمواجهة احتياجات الفئات المختلفة وحسب الفروقات الفردية بينهم.

❖ التطوير المهني لأعضاء هيئة التدريس

من الامور التي تؤخذ في الاعتبار عند تصنيف منظومة التعليم الفعالة هي وضع جودة التدريس في مكانة مهمة مع اكساب الدارسين للمعرفة إضافة الى القيم والمهارات التي هم بحاجة إليها خلال مراحل تعلمهم المختلفة طوال حياتهم. ويعتبر وضع خارطة أهداف التعليم والتعلم في استراتيجية واضحة من المسلمات في تصنيف منظومة التعليم الفعالة, وقد تتعلق هذه الاهداف بتحسين جودة التدريس, ووضع آليات لإدارة شؤون التدريس ودعمه الكامل وتطوير أدائه والحفاظ على هذا المستوى مدى عمره المهني. تظم معظم خطط التعليم استراتيجيات تشجع فعليا كلا من الجودة والتعليم, على سبيل المثال تطوير المناهج التعليمية وتطوير وتعليم المدرس, وزيادة نسبة المدرسين لتتماشى مع زيادة اعداد الطلاب وتحسين ظروف الفصول الدراسية وزيادة الاعتمادات المالية المخصصة لذلك.

معايير القبول

يخضع قسم الهندسة الميكانيكية الى آلية عمل وزارة التعليم العالي والبحث العلمي – قسم القبول المركزي حيث يتم ترشيح خريجي الدراسة الإعدادية (الفرع العلمي) للقبول في القسم بناء على معدلات التخرج اضافة الى ذلك يتم قبول الطلبة في الدراسة الصباحية الموازية وكذلك الدراسة المسائية. وكذلك يتم قبول بعض طلبة العشرة الاوائل من خريجي المعاهد الفنية والبعض الاخر من الخمسة بالمئة من اوائل الدراسات المهنية وبعض المتميزين من الموظفين من وزارات الدولة .

أهم مصادر المعلومات عن البرنامج

- 1) المواقع الالكترونية للجامعات العراقية والاجنبية.
- 2) المكتبات العلمية.
- 3) ورش العمل التي اقامتها وزارة التعليم العالي بالإضافة الى معايير الوزارة.
- 4) برنامج الاعتماد الاكاديمي الاميركي ABET.

خطة تطوير البرنامج

- 1) الالتزام المؤسسي بالتحسين المستمر لجودة المخرجات:
يلتزم قسم هندسة تقنيات ميكانيك القوى وبصورة مستمرة في المنظمة التعليمية بقوة مشاركة العاملين بالمنظمة التعليمية في عمليات ضمان الجودة وتزود شعبة ضمان الجودة في المنظمة التعليمية بالموارد اللازمة، كما تقدم المساعدة لها حيثما يحتاج الأمر الى ذلك. كما تشارك كل هيئة التدريس والموظفين في عمليات التحسين المستمر واعداد التقارير عنها- كل في مجال عمله- للوصول الى هدف التحسين المستمر للمخرجات.
- 2) استخدام المؤشرات والنقاط المقارنة المرجعية:
قسم تقنيات ميكانيك القوى دائما تقارن منجزاته مع السنة السابقة من الخطط التي تم وضعها خلال السنة الدراسية حيث تعمل على اضافة الدورات والورش والندوات والبحوث والمشاريع الطلابية على خطتها العلمية بحيث تواكب سوق العمل والتطور التقني.
- 3) حيث تم العمل بآلية نظام المقررات للمرحلة الأولى فقط (تم تغيير النظام السنوي إلى نظام جديد (المقررات) والذي أكد عليه وزارة التعليم العالي والبحث العلمي) وذلك خلال السنة الدراسية القادمة ٢٠٢٢-٢٠٢٣.
- 3) التحقق المستقل من المعايير
قسم تقنيات ميكانيك القوى يعمل على التحقق من نتائج عمليات التقييم الذاتي لجودة الاداء, وذلك بفحص الادلة والبراهين

الخاصة بها, بما في ذلك التغذية الراجعة من خلال الاستبانات و آراء اصحاب الشأن والمستفيدين مثل الطلبة , التدريسيين , الخريجين, و ارباب الاعمال (سوق العمل) ضمن عمليات التحسين المستمر.
(٤) نطاق عمليات التحسين المستمر:

تتوحد نطاق عمليات التحسين المستمر لجودة الاداء من خلال مشاركة العميد ورئيس القسم للعملية التعليمية داخل المنظمة. يتم القيام بعمليات تحسين اداء المنظمة التعليمية سنويا وبشكل منتظم, كما يتم اعداد تقارير خاصة (تقييم المنتسبين من التدريسيين والفنيين) بعمليات التقويم تقدم صورة شاملة عن أداء المنظمة التعليمية بصفة عامة, حيث ان القسم مسؤولا عن اعطاء رايه في تقييم منتسبيها حيث يتناول جزء من المدخلات, والعمليات والنواتج (المخرجات). مع التركيز على جودة النواتج ومن ثم يتم استحصال رأي وموافقة المسؤول المباشر ومن ثم موافقة الأعلى (عميد الكلية)

مخرجات التعلم المطلوبة من البرنامج

المهارات العامة والمنقولة							مخرج الوجدان والقيم					مخرج المهارات					مخرج المعرفة					اساسي أم اختياري	اسم المقرر	رمز المقرر	السنة المستوى
٧د	٦د	٥د	٤د	٣د	٢د	١د	٥ج	٤ج	٣ج	٢ج	١ج	٤ب	٣ب	٢ب	١ب	١٥	١٤	١٣	١٢	١١					
			✓	✓		✓					✓				✓				✓		أساسي	Computer Applications 3		المرحلة الثالثة	
			✓	✓	✓		✓	✓							✓					✓	أساسي	Eng. And Numerical Analysis			
		✓	✓	✓					✓	✓					✓					✓	أساسي	Automotive electronics and computer controls			
✓		✓					✓				✓					✓			✓	✓	أساسي	English Language			
✓	✓	✓		✓	✓	✓			✓					✓	✓	✓				✓	أساسي	Machine design			
			✓	✓	✓	✓			✓					✓	✓	✓				✓	أساسي	Measurements and control			
				✓	✓	✓			✓				✓	✓		✓				✓	أساسي	Theory of machines			
		✓		✓			✓				✓	✓								✓	أساسي	Vehicle Technology			
			✓	✓	✓	✓	✓	✓						✓	✓	✓				✓	أساسي	Heat Transfer			
		✓	✓		✓				✓					✓				✓			أساسي	Computer Applications 4		المرحلة الرابعة	
✓		✓	✓	✓			✓			✓	✓			✓			✓	✓		✓	أساسي	Eng. Management and quality control			
									✓	✓	✓									✓	أساسي	Advanced Automotive fault diagnosis			
✓	✓	✓		✓	✓	✓			✓					✓	✓	✓				✓	أساسي	Theory of Vehicles			
✓	✓	✓		✓	✓	✓			✓					✓	✓	✓				✓	أساسي	Design of Automotive Components and System			
				✓	✓	✓							✓			✓	✓			✓	أساسي	Vehicles Dynamics			
		✓		✓			✓					✓	✓							✓	أساسي	Advanced Automotive Technology			
✓		✓					✓					✓				✓			✓	✓	أساسي	English Language			
✓	✓				✓	✓						✓	✓	✓	✓			✓	✓	✓	أساسي	Project			



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical Engineering Techniques of Power
Scientific title: Professor
Academic qualification: Doctorate
Work location: Mechanical Engineering Techniques of Power

Course Description Form 2023/2024

1- Course Name	Fluid mechanic
2- Course Code	
3- Semester / Year	٢٠٢٤/٢٠٢٣
4- Description Preparation Date:	٢٠٢٤/٥/٧
5- Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
6- Number of study hours (total)/number of units (total)	90 hours-30 week / 6 unit
7- Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Prof. Dr. Dahfer Manea Hachim

8. Expected learning outcomes of the program

Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,	√

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9. Teaching and Learning Strategies	
Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

11. Objectives of the educational program: Given the rapid scientific and technological progress in the field of power mechanics technology, the Department of Mechanical Engineering Techniques of Power is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of mechanics technology and keeping pace with rapid scientific development through direct contact with mechanical engineering decision-makers all over the world and direct contact with colleges and institutes specialized in mechanical technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic manufactures, seminars, training and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and public manufactures administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√

E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

12. Course structure

12. Course structure										
Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	- General definitions - Newton's law of Viscosity	The direct method is	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student .opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	2	Knowledge and understanding	√	- Kinematic viscosity - Bulk Modulus of elasticity	The direct method is	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
۳	۳	Knowledge and understanding	√	- Surface tension.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۴	۳	Knowledge and understanding	√	Fluid Statics - Definitions - Pressure at a point	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
o	r	Knowledge and understanding	√	- Variation of Pressure in a static fluid	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
6	r	Knowledge and understanding	√	- Hydrostatic laws - Units and scales of Pressure measurement	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
γ	ϛ	Knowledge and understanding	√	- Manometers (Pressure Measurement)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
λ	ϛ	Knowledge and understanding	√	Force on plane surfaces	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

9	2	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	2	Knowledge and understanding	√	Force on curved surfaces	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	2	Knowledge and	√		The direct method is	√	Written tests	√	Interviews or	

		understanding		- Buoyant force	.through lectures			questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
		Knowledge and understanding	√	Stability of floating and submerged bodies - Relative equilibrium	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters
۱۲	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to
۱۳	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to

								survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٤	٣	Knowledge and understanding	√	- Stability of floating and submerged bodies - Relative equilibrium (linear acceleration)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters	
١٥	٣	Knowledge and understanding	√	Relative equilibrium (uniform rotation)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√

								opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters	√
١٦	٢	Knowledge and understanding	√	Fluid flow concepts and	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٧	٢	Knowledge and understanding	√	Basic Equations - Definitions	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۸	۳	Knowledge and understanding	√	Continuity equation	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۹	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۰	۳	Knowledge and understanding	√	Euler's equation of motion along streamline	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۱	۳	Knowledge and understanding	√	Bernoulli equation	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

					research papers and discussing them collectively				survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۲	۳	Knowledge and understanding	√	Steady-state energy equation	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۳	۳	Knowledge and understanding	√	Flow Measurement (Pitot tube)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'	

					discussing them collectively				opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٤	٣	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٥	٣	Knowledge and understanding	√	Flow Measurement (orifice meter)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۶	۲	Knowledge and understanding	√	Flow Measurement (Venturi meter)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۷	۲	Knowledge and understanding	√	Flow Measurement (nozzle)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۸	۳	Knowledge and understanding	√	- Resistance to flow in open and closed - Resistance to flow in open and closed	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۹	۳	Knowledge and understanding	√	- Flow in pipes (laminar and Turbulent flow)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

13. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	۱۰	۱۰	۱۰	۱۰	۱۰	40

14. Learning and teaching resources

Mechanics of Fluids	Required textbooks (methodology, if any)
Fluid Mechanics	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical Engineering Techniques of Power
lecturer name: Balasem Abdulameer Jabbar Al-quraishi
Scientific title: Assist Professor
Academic qualification: Doctorate
Work location: Mechanical Engineering Techniques of Power

Course Description Form 2023/2024

8- Course Name	Internal Combustion Engines
9- Course Code	ARE 449
10- Semester / Year	٢٠٢٤/٢٠٢٣
11- Description Preparation Date:	٢٠٢٤/٤/٧
12- Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
13- Number of study hours (total)/number of units (total)	90 hours-30 week / 6 unit
14- Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Asst. Prof. Dr. Balasem Abdulameer Jabbar Al-quraishi

10. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,	√

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11. Teaching and Learning Strategies	
Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

15. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students	√

		with the faculty	
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

16. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	Introduction to Combustion Engines -I.C Engines Classifications, -I.C Engines applications	The direct method is .through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student .opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	2	Knowledge and understanding	√	Engine Components, Basic Engine Cycles	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
۳	۳	Knowledge and understanding	√	Engine Parameters	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۴	۳	Knowledge and understanding	√	Work, Mean effective pressure, Torque and power	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
o	۲	Knowledge and understanding	√	Air- Fuel Ratio and Fuel-Air ratio, Engine Efficiencies	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۶	۲	Knowledge and understanding	√	Performance Tests, Measurement of engine torque and power, Heat Balance of Engine	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
γ	۳	Knowledge and understanding	√	Otto Cycle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
λ	۳	Knowledge and understanding	√	Diesel Cycle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

9	2	Knowledge and understanding	√	Dual Cycle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	3	Knowledge and understanding	√	Compression of Otto, Diesel, Dual	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	3	Knowledge and	√	The Two-Stroke Engine	The direct method is	√	Written tests	√	Interviews or	

		understanding		Cycles, Regenerative Cycles	.through lectures			questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
		Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
۱۲	۳	Subject-specific skills	√	Fuel Air Cycle (Variation of Specific Heats, Dissociation Effect, Comparison of P-V Diagram of Air-Standard And Fuel – Air Cycle For SI Engine)	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۱۳	۳	Knowledge and understanding	√	The actual cycle (Losses Occurring In The Actual	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to

				Engine, Effect of Throttle Opening, Effect of Spark Timing)				survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٤	٣	Knowledge and understanding	√	Valves Timing Diagram for Four and Two Stroke Engines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٥	٣	Knowledge and understanding	√	Intake Manifold, Intake Valves	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√

								opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
١٦	٢	Knowledge and understanding	√	Fuel Injectors, Carburetors	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٧	٢	Knowledge and understanding	√	Air And Fuel Flow in Carburetors	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۸	۳	Knowledge and understanding	√	Supercharging and Turbocharging	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۹	۳	Knowledge and understanding	√	Intake For CI Engines, Effect of Operating Characteristics On Engine Performance	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۰	۳	Knowledge and understanding	√	Types of Fuels (Solid Fuels, Liquid Fuels, Gaseous Fuels)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۱	۳	Knowledge and understanding	√	Combustion (Nature of combustion process, Types of combustion processes, Combustion stoichiometry)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

					research papers and discussing them collectively			survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۲	۲	Knowledge and understanding	√	The air fuel ratio and incomplete combustion	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۳	۳	Knowledge and understanding	√	Analysis of Combustion Products	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

					discussing them collectively				opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۴	۳	Knowledge and understanding	√	Applying the First law of thermodynamic to combustion processes.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۵	۳	Knowledge and understanding	√	Energy Analysis of Reacting Mixtures	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۶	۲	Knowledge and understanding	√	Combustion In SI Engines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۷	۲	Knowledge and understanding	√	Combustion In CI Engines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۸	۳	Knowledge and understanding	√	Exhaust Blowdown, <i>Exhaust Stroke</i>	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۹	۳	Knowledge and understanding	√	Introduction For Two – Stroke Engine	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

17. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	10	10	10	10	10	40

18. Learning and teaching resources

Aircraft Systems and maintenance, lists of Airbus company	Required textbooks (methodology, if any)
Aircraft Systems and maintenance, lists of Airbus company	Main references (sources)
Aircraft Systems and maintenance, lists of Airbus company	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جهاز الاشراف والتقويم العلمي



اسم الجامعة : جامعة الفرات الأوسط
اسم الكلية : الكلية التقنية الهندسية النجف
اسم القسم : هندسة تقنيات ميكانيك القوى
اسم المحاضر : حيدر علي عبد الحسين
اللقب العلمي : مدرس
المؤهل العلمي : ماجستير
مكان العمل : هندسة تقنيات ميكانيك القوى

نموذج وصف المقرر للعام الدراسي ٢٠٢٣/٢٠٢٤

1- Name of the course			
Engine technology			
2- Course code			
3- Academic year:			
2023/2024			
4- Date this description was prepared:			
6/27/2024			
5- Available forms of attendance:			
Lecture in person (electronically if necessary)			
6- Number of study hours (total)/number of units (total)			
90 hours over 30 weeks / 6 units			
7- Name of the course administrator (if there is more than one teaching staff, all their names will be mentioned)			
M. Haider Ali Abdul Hussein			
8- Course outcomes (outputs derived from the educational program outcomes of the Aviation Technology Engineering Department)			
	Identify the different types of engines (internal combustion, external combustion, electric, turbo).	1 a	A- Knowledge and understanding
√		2a	
√	Knowledge of basic engine components and their functions (such as cylinders, pistons, valves, electric motors).	3a	B- Subject-specific skills
√	Understand how these components interact to achieve optimal operation.	4A	
√		1 b	
	Study of different work cycles (Auto cycle, Diesel cycle).	2 b	
√	Using modern tools and techniques to diagnose faults in engines.	3 b	C- Thinking skills
√	Disassemble and assemble engine components correctly and safely.	4 b	
√	Performing preventive and corrective maintenance on engines.	1 c	
√	Analyze performance data of engines to determine efficiency and potential problems.	2 c	
√	Ask important questions and test assumptions to ensure the validity of the results.	3 c	
√	Analyze and evaluate information related to engine performance and technical problems.	4 c	
√	Speak confidently and effectively in meetings and seminars.	1 d	D-General and

√	Ability to communicate effectively with colleagues and clients.	2 d	transferable skills (other skills related to employability and personal development)
√	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	3 d	
√	The ability to lead work teams and direct efforts towards achieving goals.	4 d	

Teaching and learning strategies - ⁹	
Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that .include some sampling activities of interest to students	The strategy

Outcomes of the bachelor's program in technical engineering according to the guidelines of the National - ¹ Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for .Engineering and Technology (ABET) and the International Federation of Engineers (IEA)	
√	A - Apply basic principles of mathematics, natural sciences, and engineering concepts to solve engineering problems.
√	B- Design experiments related to technical engineering, conduct them effectively, and analyze and interpret the results to reach useful conclusions.
	T- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.
	D- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.
√	C- Works effectively as a member or leader in a specialized engineering team.
√	H-Identifies, analyzes and solves large-scale engineering problems.
√	G - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.
√	D- Participates in self-directed continuing professional development.
√	I- Works to understand and adhere to professional and ethical responsibilities.
√	T- He works to understand the impact of solutions to engineering problems locally and globally and applies them in his field of specialization.
√	G- Cooperation and teamwork with individuals from different technical and professional backgrounds to achieve common goals.

Objectives of the educational program: In view of the rapid scientific and technological progress in the field ^{١١} of mechanical technology, the Power Mechanics Technology Engineering Department is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear			
√	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with decision-makers for mechanical engineering in all parts of the world and direct contact with colleges and institutes specialized in the field of mechanical engineering	1a	A- Maintaining and improving the quality of the curriculum
√	.Continuous evaluation and development of curricula	2a	
√	.Linking student projects and research to community needs	3a	
√	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops	4A	
√	استخدام الطلبة لحدث التقنيات الحديثة المختبرية والبرمجية	1b	B-Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops
√	توفير القاعات الدراسية المكيفة والمجهزة بأحدث أجهزة العرض , مع توفير مكاتب للتدريسيين ووجود مساحات خضراء ونادي ومكتبة	1C	C- Providing the best university environment for the faculty and students
√	تشجيع المشاركة و الزيارات العلمية الفعالة في المؤتمرات والاجتماعات الفنية و خاصة مع ادارات المطارات العراقية والدولية وشركات التدريب العالمية.	1D	D- Maintaining the technical development of faculty members
√	المراجعة المستمرة والتقييم لنشاطات الطلبة والهيئة التدريسية	2D	
√	تشجيع مبادرات و إنجازات الطلبة بمختلف المجالات الاكاديمية والفنية والدينية بمعية هيئة التدريس	3D	
√	القيام بالأبحاث النظرية والتطبيقية المتميزة للطلبة بمعية الهيئة التدريسية	E1	E- Knowledge production
√	شجيع النشر العلمي وتحفيز العمل الجماعي للمجموعات البحثية من التخصصات المختلفة	E2	
√	السعي لزيادة مصادر التمويل البحثي العملي والنظري للطلبة والهيئة التدريسية من خلال النشر في المجالات الهندسية المحلية و الدولية	E3	
√	المبادرات الخاصة بتقليص الروتين الاداري وتسهيل اجراءات العمل من خلال الارشاد التربوي و تطوير العلاقة بين الطلبة والتدريسيين	1F	F- Initiatives
√	تنظيم المؤتمرات, الندوات والدورات التعليمية	1G	F- Activating and strengthening ties with public government agencies and the private sector
√	تشجيع العمل الاستشاري وتوفير الخدمات على المستوى المهني في كافة الاختصاصات الهندسية (الحاضنة التكنولوجية)	2G	

Course structure - 9										
method Indirect assessment		Direct assessment method		method		Name of the unit or topic Learning	outcomes		Hours Required	Week learning
Interviews or questionnaires to survey graduates' opinions			Written tests	✓	The direct method is through lectures.	Internal combustion engine	✓	Knowledge and understanding	3	1
Interviews or questionnaires to survey employers' opinions		✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.			Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators			Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions		✓	Written tests	✓	The direct method is through lectures.	Cylinder	✓	Knowledge and understanding	3	2
Interviews or questionnaires to survey employers' opinions		✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student		✓	Completion files and performance	✓	Scientific seminars on the most important research carried out in the field of		✓	thinking skills		

	opinions.		evaluation		specialization.				
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	piston	✓	Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills	
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.		✓	Knowledge and understanding	
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively	Engine duty cycle	✓	Subject-specific skills	۳
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills	

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	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Internal combustion	✓	Knowledge and understanding	۳	۵
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.		✓	Knowledge and understanding		
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively	Crankshaft	✓	Subject-specific skills	۳	۶
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and	✓	An interactive method by dividing students into		✓	Generic and transferable skills (other skills related to		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.		✓	Knowledge and understanding		

			observation		small groups			employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Fuel	✓	Knowledge and understanding	۳	۷
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Compression ratio	✓	Knowledge and understanding	۳	۸
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		

Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Combustion control	✓	Knowledge and understanding	۳	۹
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Engine cooling	✓	Knowledge and understanding	۳	۱۰
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or	✓	Written tests	✓	The direct method is through lectures.	Lubrication system	✓	Knowledge and understanding	۳	۱۱

questionnaires to survey graduates' opinions									
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Cooling system	✓	Knowledge and understanding		
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	۳	۱۲
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to	✓	Written tests	✓	The direct method is through lectures.	Fuel system	✓	Knowledge and understanding	۳	۱۳

	survey graduates' opinions								
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills	
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Supercharging system	✓	Knowledge and understanding	
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	۳
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills	
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
✓	Interviews or questionnaires to survey graduates'	✓	Written tests	✓	The direct method is through lectures.	Ignition system	✓	Knowledge and understanding	۳

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۱۰

	opinions								
√	Interviews or questionnaires to survey employers' opinions	√	Oral exams	√	The subjective method is through preparing research papers and discussing them collectively		√	Subject-specific skills	
√	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	√	Scientific seminars on the most important research carried out in the field of specialization.		√	thinking skills	
√	External evaluators		Projects and observation	√	An interactive method by dividing students into small groups		√	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	√	Written tests	√	The direct method is through lectures.	Exhaust system	√		
	Interviews or questionnaires to survey employers' opinions	√	Oral exams	√	The subjective method is through preparing research papers and discussing them collectively		√		۳
	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	√	Scientific seminars on the most important research carried out in the field of specialization.		√		
	External evaluators		Projects and observation	√	An interactive method by dividing students into small groups		√		
	Interviews or questionnaires to survey graduates' opinions	√	Written tests	√	The direct method is through lectures.	Air supply system	√	Knowledge and understanding	۳
	Interviews or	√	Oral exams	√	The subjective method is		√	Subject-specific skills	۱۷

	opinions			collectively						
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		thinking skills			
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development)			
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Exhaust system	Knowledge and understanding	۳		
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills			
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		thinking skills			
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development)			
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.		Operating and lubrication system		Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively				Subject-specific skills	

	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Emission control system	✓	Knowledge and understanding		
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	۳	۲۴
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through the lecturer	Emission control system	✓	Knowledge and understanding		
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills	۳	۲۵
	Interviews or questionnaires to	✓	Completion files and performance	✓	The subjective method is through preparing		✓	thinking skills		

	survey student opinions.		evaluation		research papers and discussing them collectively				
	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	Emission control system	✓	Knowledge and understanding	
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills	۳
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills	۲۶
	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	Emission control system	✓	Knowledge and understanding	
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills	۳
	Interviews or questionnaires to survey student	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them		✓	thinking skills	۲۷

	opinions.			collectively						
	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	Emission control system	✓	Knowledge and understanding	۳	۲۸
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills		
	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups		✓	Knowledge and understanding		
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.	Emission control system	✓	Subject-specific skills	۳	۲۹
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills		

	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)		
✓	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	Emission control system Internal combustion engine	✓	Knowledge and understanding	۳	۳۰
✓	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills		
✓	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills		
✓	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions		Written tests		An interactive method by dividing students into small groups			Knowledge and understanding		

Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written -10 .exams, reports, etc

Final/theoretical exam	Final/practical exam	year works? Activities and absences	Second/practical semester	Second/theoretical semester	semester/practical	The first semester/theoretical.
ξ.	١.	١.	١.	١.	١.	١.

Learning and teaching resources - ١٠	
Electric Motors and Drives: Fundamentals, Types and Applications "	Required textbooks (methodology, if any)
Electrical Machines, Drives and Power Systems	Main references (sources)
. "AC Machines: Fundamentals, Control, and Diagnosis"	Recommended supporting books and references (scientific journals, reports....)
Google Scholar:	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical Engineering Techniques of Power
Scientific title: Ass. lecture
Academic qualification: Master
Work location: Mechanical Engineering Techniques of Power

Course Description Form 2023/2024

16-	Course Name	
		Mathematics
17-	Course Code	
18-	Semester / Year	
		2023-2024
19-	Description Preparation Date:	
		01/06/2024
20-	Available Attendance Forms:	
		Lectures in the presence of students (Online if necessary)
21-	Number of study hours (total)/number of units (total)	
		90(hr)- 30week /6 (unit)
22-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
		Ass. Lecture Ahmed Jamal Ibrahim

12. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply mathematics in science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	To introduce the student to the basic and advanced principles of calculus and integrations and its various applications	√
D2	To develop his mental abilities when solving exercises.	√
D3	Linking data with information to reach a solution to issues and benefit from them in other subjects.	√
D4		√

13. Teaching and Learning Strategies

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials that are interesting to the students.
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10. The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials that are interesting to the students.	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

19. . The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials that are interesting to the students.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical	√

		research for students and faculty through publishing in local and international engineering journals	
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

20. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	3	Knowledge and understanding	√	General Review in Differential and Integral Calculus	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
4	3	Knowledge and understanding	√	Vectors, scalar and vector products and projections, some applications about vectors	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
8	3	Knowledge and understanding	√	Complex numbers – Polar form – Euler's formula – Powers and roots of complex numbers – Complex functions – Cauchy-Riemann equation	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
11	3	Knowledge and understanding	√	Functions with two more variables – Partial derivatives – Chain rule for partial derivatives – Directional derivative – Maximum and minimum values – functions in two variables	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
14	3	Knowledge and understanding	√	Double integrals, areas, and volumes and some applications in mechanical	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
17	3	Knowledge and understanding	√	Polar coordinates – Cylindrical and spherical coordinates – Plotting curves in polar coordinates	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
18	3	Knowledge and understanding	√	Green's theorem – Divergence theorem	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
19	3	Knowledge and understanding	√	linear integration and some applications	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

23	3	Knowledge and understanding	√	Series: Sequence of numbers - Definition - Limits - Infinite series - Limit by definition - Alternating series with their tests -Power series - Radius of convergence - Taylor and Maclaurin series of functions - General applications	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
25	3	Knowledge and understanding	√	Matrix and all the operations on them- Method of finding the inverse of the matrix	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
26	3	Knowledge and	√	The differential	The direct method is	√	Written tests	√	Interviews or	

		understanding		equations of first-order.	.through lectures			questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
27	3	Knowledge and understanding	√	Higher orders differential equation	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
28	3	Knowledge and understanding	√	Simplified differential equations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to

								survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
29	3	Knowledge and understanding	√	Simplified differential equations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
	3	Knowledge and understanding	√	Preparatory week before the Final Exam	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√

21. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

the exams	Projects	Reports	Homeworks	Semi-final exam	Final/practical exam	Final theoretical exam
10	10	10	10	10	10	60

22. Learning and teaching resources

Calculus, R. Mohammed and A. Abdulaali, 2002	Required textbooks (methodology, if any)
Advanced calculus, Murray R. Splegel, 1962	Main references (sources)



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Department of power mechanics engineering
techniques
Scientific title: Assistant Lecturer
Academic qualification: Master
Work location: Department of power mechanics engineering
techniques

Course Description Form 2023/2024

23-	Course Name	English Language
24-	Course Code	ARE 449
25-	Semester / Year	٢٠٢٤/٢٠٢٣
26-	Description Preparation Date:	٢٠٢٤/٤/٧
27-	Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
28-	Number of study hours (total)/number of units (total)	30 hours-30 week / 2 unit
29-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Asst.Lect. Mohammed Salim Abdulameer

14. Expected learning outcomes of the program		
Knowledge and understanding		
A1	1. Develop their intellectual, personal and professional abilities.	√
A2	2. Develop their intellectual, personal and professional abilities.	√
A3	3. Acquire basic language skills (listening, speaking, reading and writing) in order to communication with speakers of English language.	√
A4	4. Develop positive attitudes towards learning English.	√
Subject-specific skills		
B1	Ability to work and integrate into Phonotic and reading	√
B2	Ability to write a sentences	√
B3	The ability to use modern techniques, in learning English	√
B4	Ability to understanding any shape and form in teaching English Language	√
thinking skills		
C1	1. Putting Language into practice through speaking.	√
C2	2. Being able to read Advertisements or English writing through developing reading skill.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work the form of Teaching English.	√
D2	Skill in rading and writing of English Languge.	√
D3	The ability to work with new generation for listen.	√

15. Teaching and Learning Strategies

Strategies	<p>1- Uses the available material to increase his efficiency.</p> <p>2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task.</p> <p>3- Defines basic Modals and employ them in elementary level of communication and writing skills.</p> <p>4- Develop and enhance students' language skills to communicate in English properly.</p> <p>5- Interprets the texts written in elementary level of English.</p>
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
1- Uses expressions of Quantity in elementary level of English.	√
2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task.	√
3- Defines basic Modals and employ them in elementary level of communication and writing skills.	
4- Translates sentences in elementary level from English to another language.	
5- Interprets the texts written in elementary level of English.	√

23. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A-	Maintaining	and	A1
1-The aim of this course is to provide English learners with integrated			√

improving the quality of the curriculum		language skills such as reading, listening and writing resulting in a level of basic language knowledge.	
	A2	2-This course will focus on grammar rules, basic word knowledge and usage, reading comprehension, reading out of the lesson, and Paragraph writing.	√
	A3	3- A student may be able to listen to native speakers and speak English Language.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all English language specializations (technology incubator)	√

24. Course structure

Week	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Direct assessment method	Indirect assessment method
1	1	Cognitive output	Introduction in English Language	Lecture	Written tests	Interviews or questionnaires to survey graduates' opinions
		Cognitive output		Discussion	Oral exams	Interviews or questionnaires to survey employers' opinions
		Cognitive output		Lecture	Completion files and performance assistant	Interviews or questionnaires to survey student .opinions
		Knowledge and skills		Discussion	Projects and observation	external assessmeters
2	1	Cognitive output	What are auxiliary?	Lecture	Written tests	Interviews or questionnaires to survey graduates' opinions
		Knowledge and skills		Discussion	Oral exams	Interviews or questionnaires to survey employers' opinions
		Cognitive output		Lecture	Completion files and performance assistant	Interviews or questionnaires to survey student opinions.
		Knowledge and skills		Discussion	Projects and observation	external assessmeters
3	1	Cognitive output		Lecture	Written tests	Interviews or questionnaires to survey graduates'

								opinions	
		Knowledge and skills	√	verbs English key words in Mechanical Engineering Techniques of Power Department.	Discussion	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Cognitive output	√		Lecture	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Knowledge and skills	√		Discussion	√	Projects and observation		external assessmeters
ε	)	Cognitive output	√	The present simple tense + Synonyms	Lecture	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Knowledge and skills	√		Discussion	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Cognitive output	√		Lecture	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Knowledge and skills	√		Discussion	√	Projects and observation		external assessmeters
ο	)	Cognitive output	√	What are auxiliary .verbs? + Presentation	Lecture	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Knowledge and skills	√		Discussion	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Cognitive output	√		Lecture	√	Completion files and performance	√	Interviews or questionnaires to

11	1	Cognitive output	√	English key words in Mechanical Engineering Techniques of Power .Department	Lecture	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Projects and observation		external assessmeters	
12-14	1	Cognitive output	√	Paraphrasing English Language	Lecture	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Projects and observation		external assessmeters	
15	1	Cognitive output	√	.Exam	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions		

16-18	√	Cognitive output	√	Summarizing English Language suppression	Lecture	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
19-21	√	Cognitive output	√	Quotations English Language+ Presentation.	Lecture	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Projects and observation		external assessmeters	
22	√	Cognitive output	√	Opposites.	Lecture	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Projects and observation		external assessmeters	

23	✓	Cognitive output	✓	Using of used to in English Language.	Lecture	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	✓
		Knowledge and skills	✓		Discussion	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	✓
24-26	✓	Cognitive output	✓	Polite request English s language	Lecture	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	✓		Discussion	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	✓		Lecture	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	✓		Discussion	✓	Projects and observation		external assessmeters	
27-29	✓	Cognitive output	✓	Steps of writing in English Language.	Lecture	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	✓		Discussion	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	✓		Lecture	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	✓		Discussion	✓	Projects and		external assessmeters	

						observation			
30	)	Cognitive output	√	Review.	Lecture	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Knowledge and skills	√		Discussion	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

First semester/theoretical	Second/theoretical semester	Work of the year/activities and absences	Final/theoretical exam
20	20	10	50

25. Learning and teaching resources

Pre-Intermediate New Headway Plus By: John Soars & Liz Soars	Required textbooks (methodology, if any)
- Alexander, L G. Developing Skills: Student's Book (New Concept English)	Main references (sources)
- Raymond, Murphy. English Grammar in Use (2nd ed.). Cambridge University Press.	Recommended supporting books and references (scientific journals, reports....)
Google Books Google Scholar engvid.com	Electronic references, Internet sites



Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department

University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department : Technical mechanical engineering
Scientific title: Professor
Academic qualification: Ph.D
Work location: Technical mechanical engineering

Course Description Form 2023/2024

1- Course Name
Strength of materials
2- Course Code
3- Semester / Year
2023/2024
4- Description Preparation Date:
20/4/2024
5- Available Attendance Forms:
Lectures in the presence of students (Online if necessary)
6- Number of study hours (total)/number of units (total)

120 hours-30 week / 5 unit

7- Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)

Prof.Dr. Montadhar Almoussawi

8. Expected learning outcomes of the program

Knowledge and understanding

A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√

Subject-specific skills

B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√

thinking skills

C1	The ability to communicate effectively with those concerned with the field of	√
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	specialization on both the civil and military sides	
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on mechanical engineering especially automotive	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical faults in design.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,)	√

9. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).

a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√

c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

11. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of mechanical technology and keeping pace with rapid scientific development through direct contact with mechanical engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a	√

for faculty and students		library.	
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	✓
	D2	Continuous review and evaluation of student and faculty activities	✓
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	✓
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	✓
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	✓
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	✓
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	✓
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	✓
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	✓

12. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	3	Knowledge and understanding	√	Stress and Strain -Study and analysis of simple stress and simple strain	The direct method is through lectures.	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	3	Knowledge and understanding	√	Material Behavior -Study the behavior of material under load (tensile test	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
3	3	Knowledge and understanding	√	Hooke's Law	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
4	3	Knowledge and understanding	√	Statically indeterminate Problem -Basic principles for solving Statically	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to	

				indeterminate Problem -Method of solution concern statically indeterminate Problem	research papers and discussing them collectively				survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
5	3	Knowledge and understanding	√	Thermal Strain and Stress -Study the strain and stress induced due	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√	to temperature changes -Solve statically indeterminate problems due to temperature changes	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
6	3	Knowledge and understanding	√	Pressure Vessels -Stresses in pressure	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates'	

		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓

vessels

7	3	Knowledge and understanding	✓
		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and	✓

Stress Concentration

-Study where the stresses rising due to

section changes

					opinions	
		The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions
		Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.
		An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters
		The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions
		The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions
		Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.
		An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters

		personal development)							
8	3	Knowledge and understanding	√	Torsion of Circular Shaft -Study the pure torsion for solid and hollow circular shafts	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
9	3	Knowledge and understanding	√	Study the stress induced due to torsion	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student

					specialization.				opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	3	Knowledge and understanding	√	Study the angular deformation induced due to torsion	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	3	Knowledge and understanding	√	Beams: Shear force and Bending Moment -Introduction to beams and loading types and the resulted shear	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

				and moment	collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
12	3	Knowledge and understanding	√	Beams: S.F. and B.M. Diagrams -Draw the Shear force and Bending	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	Moment in beams	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
13	3	Knowledge and understanding	√	Stress in Beams -Study the stress induced in beams due to	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions

		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓
14	3	Knowledge and understanding	✓
		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓

lateral loads

-Economic section and how to calculate and reduce the induced stresses at beams

The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters

15	3	Knowledge and understanding	√	Double integration method -Learn how to find the equation of elastic curve	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
16	3	Knowledge and understanding	√	-Economic section and how to calculate and reduce the induced stresses at beams	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	✓
17	3	Knowledge and understanding	✓
		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓
18	3	Knowledge and understanding	✓
		Subject-specific skills	✓

Double method integration

-Learn how to find the equation of elastic curve

-Learn how to find the equation of elastic curve

An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters	
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters	
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	

		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
19	3	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
20	3	Knowledge and understanding	√
		Subject-specific skills	√

Moment-Area method
-Basic principles concern using Mohr's area method

Study how to find deflection and slope at a certain point

Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to	

					research papers and discussing them collectively				survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
21	3	Knowledge and understanding	√	Statically indeterminate beams -Solving beams statically indeterminate problems	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
22	3	Knowledge and understanding	√	Stresses at a point -Study the stresses at a	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates'	

				point
		Subject-specific skills	✓	
		thinking skills	✓	
		Generic and transferable skills (other skills related to employability and personal development)	✓	

23	3	Knowledge and understanding	✓	Stresses at a point -Basic principles for calculating the combined stresses at a point
		Subject-specific skills	✓	
		thinking skills	✓	
		Generic and transferable skills (other skills related to employability and	✓	

					opinions
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters	
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters	

		personal development)	
24	3	Knowledge and understanding	✓
		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓
25	3	Knowledge and understanding	✓
		Subject-specific skills	✓
		thinking skills	✓

Mohr's Circle
 -Graphical representation of stress at a point using Mohr's circle

Systematic procedure of graphical representation of stresses at a point using Mohr's circle

The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters	
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student	

		Generic and transferable skills (other skills related to employability and personal development)	✓
26	3	Knowledge and understanding	✓
		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓
27	3	Knowledge and understanding	✓
		Subject-specific skills	✓

Bending with Torsion
 -Study the stress due to combined bending and torsion loads

Practical cases of the stresses induced due to combined bending and torsion loads

specialization.				opinions.
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions

		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓
28	3	Knowledge and understanding	✓
		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓
29	3	Knowledge and understanding	✓

Short Columns
 -Study the stress induced in Short Columns

Euler's Column Equation
 -Study the stress induced in relatively

collectively				
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions

		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓
30	3	Knowledge and understanding	✓
		Subject-specific skills	✓
		thinking skills	✓
		Generic and transferable skills (other skills related to employability and personal development)	✓

long Columns

Euler's Column Equation
 -Buckling for medium columns using Rankine method... etc

The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters	
The direct method is through lectures.	✓	Written tests	✓	Interviews or questionnaires to survey graduates' opinions	✓
The subjective method is through preparing research papers and discussing them collectively	✓	Oral exams	✓	Interviews or questionnaires to survey employers' opinions	✓
Scientific seminars on the most important research carried out in the field of specialization.	✓	Completion files and performance assistant	✓	Interviews or questionnaires to survey student opinions.	✓
An interactive method by dividing students into small groups	✓	Projects and observation		external assessmeters	✓

13. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
20		20		10		50

14. Learning and teaching resources

Mechanics of Materials R.C Hibbler	Required textbooks (methodology, if any)
Mechanics of Materials E J Hearn	Main references (sources)
Strength of materials books	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical Engineering Techniques of Power
Scientific title: Ass. lecture
Academic qualification: Master
Work location: Mechanical Engineering Techniques of Power

Course Description Form 2023/2024

30-	Course Name	
		Mathematics
31-	Course Code	
32-	Semester / Year	
		2023-2024
33-	Description Preparation Date:	
		01/06/2024
34-	Available Attendance Forms:	
		Lectures in the presence of students (Online if necessary)
35-	Number of study hours (total)/number of units (total)	
		90(hr)- 30week /6 (unit)
36-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
		Ass. Lecture Ahmed Jamal Ibrahim

16. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply mathematics in science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	To introduce the student to the basic and advanced principles of calculus and integrations and its various applications	√
D2	To develop his mental abilities when solving exercises.	√
D3	Linking data with information to reach a solution to issues and benefit from them in other subjects.	√
D4		√

17. Teaching and Learning Strategies

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials that are interesting to the students.
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10. The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials that are interesting to the students.	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

26. . The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials that are interesting to the students.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical	√

		research for students and faculty through publishing in local and international engineering journals	
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

27. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	3	Knowledge and understanding	√	General Review in Differential and Integral Calculus	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
4	3	Knowledge and understanding	√	Vectors, scalar and vector products and projections, some applications about vectors	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
8	3	Knowledge and understanding	√	Complex numbers – Polar form – Euler's formula – Powers and roots of complex numbers – Complex functions – Cauchy-Riemann equation	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
11	3	Knowledge and understanding	√	Functions with two more variables – Partial derivatives – Chain rule for partial derivatives – Directional derivative – Maximum and minimum values – functions in two variables	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
14	3	Knowledge and understanding	√	Double integrals, areas, and volumes and some applications in mechanical	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
17	3	Knowledge and understanding	√	Polar coordinates – Cylindrical and spherical coordinates – Plotting curves in polar coordinates	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
18	3	Knowledge and understanding	√	Green's theorem – Divergence theorem	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
19	3	Knowledge and understanding	√	linear integration and some applications	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

23	3	Knowledge and understanding	√	Series: Sequence of numbers - Definition - Limits - Infinite series - Limit by definition - Alternating series with their tests -Power series - Radius of convergence - Taylor and Maclaurin series of functions - General applications	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
25	3	Knowledge and understanding	√	Matrix and all the operations on them- Method of finding the inverse of the matrix	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
26	3	Knowledge and	√	The differential	The direct method is	√	Written tests	√	Interviews or	

		understanding		equations of first-order.	.through lectures			questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
27	3	Knowledge and understanding	√	Higher orders differential equation	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
28	3	Knowledge and understanding	√	Simplified differential equations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to

								survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
29	3	Knowledge and understanding	√	Simplified differential equations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
	3	Knowledge and understanding	√	Preparatory week before the Final Exam	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√

28. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

the exams	Projects	Reports	Homeworks	Semi-final exam	Final/practical exam	Final theoretical exam
10	10	10	10	10	10	60

29. Learning and teaching resources

Calculus, R. Mohammed and A. Abdulaali, 2002	Required textbooks (methodology, if any)
Advanced calculus, Murray R. Splegel, 1962	Main references (sources)



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: : Mechanical Engineering Techniques of Power
Scientific title: lecturer
Academic qualification: Master
Work location: Mechanical Engineering Techniques of Power

Course Description Form 2023/2024

37-	Course Name	
		Automotive Electricity
38-	Course Code	
39-	Semester / Year	
		2023/ 2024
40-	Description Preparation Date:	
		1/ 7 / 2024
41-	Available Attendance Forms:	
		Lectures in the presence of students (Online if necessary)
42-	Number of study hours (total)/number of units (total)	
		180 hours-30 week / 6 unit
43-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
		Mohammed Ali Diwan

18. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on workshop	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic .	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration engineering, mechanical engineering, ,)	√

19. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

30. Objectives of the educational program: Given the rapid scientific and technological progress in the field of automotive technology, the Department of mechanical Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of automotive technology and keeping pace with rapid scientific development through direct contact with mechanical engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic mechanical and power plants , seminars, and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√

	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

31. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	6	Knowledge and understanding	√	electric vehicles The importance of - basic principles for understanding vehicle electricity	The direct method is .through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student .opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	6	Knowledge and understanding	√	Identify the basic parts of electrical materials	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
3	6	Knowledge and understanding	√	Study the basic types of batteries used in . vehicles	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
4	6	Knowledge and understanding	√	Learn about ways to charge batteries in the laboratory	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups					
5	6	Knowledge and understanding	√	The generating device in the dyno vehicle and how to dismantle it	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
6	6	Knowledge and understanding	√	Types of generating devices and how they operate inside the vehicle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	

		personal development)							
7	6	Knowledge and understanding	√	Identify voltage regulators	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
8	6	Knowledge and understanding	√	Regulating the voltages coming out of the generator and how to control it with the battery	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

9	6	Knowledge and understanding	√	Learn about the actual performance of the battery with the generator in practice	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	6	Knowledge and understanding	√	Learn how to operate the vehicle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	6	Knowledge and	√		The direct method is	√	Written tests	√	Interviews or	

		understanding		The basic parts of the self-propelled motor and how to install it	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
12	6	Knowledge and understanding	√	Managing the self-propelled motor via the ignition switch	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
13	6	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				Identify faults in the engine operating circuit				survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
14	6	Knowledge and understanding	√	Identify faults in the engine operating circuit	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
15	6	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√

								opinions		
		Subject-specific skills	√	Identifying and maintaining system malfunctions	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
16	6	Knowledge and understanding	√	Ignition system in gasoline engines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
17	6	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√	The basic types of ignition system	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
18	6	Knowledge and understanding	√	Identify malfunctions and how to inspect and repair the ignition system	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
19	6	Knowledge and understanding	√	Electrical connection of traditional and modern ignition systems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
20	6	Knowledge and understanding	√	Inspection and operation of the ignition systems on the vehicle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
21	6	Knowledge and understanding	√	Lighting system in vehicles	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

					research papers and discussing them collectively			survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
22	6	Knowledge and understanding	√	Identify the vehicle's interior and exterior lighting system	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
23	6	Knowledge and understanding	√	The basic types of front and rear lighting systems in the vehicle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

					discussing them collectively				opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
24	6	Knowledge and understanding	√	The side signals system, emergency systems, and ancillary systems in the vehicle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
25	6	Knowledge and understanding	√	Electrical connection to the lighting circuits . in the vehicle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
26	6	Knowledge and understanding	√	Accessory circuits and devices such as windshield wipers, alarms, and connecting the cooling fan to the engine	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
27	6	Knowledge and understanding	√	Accessory circuits and devices such as windshield wipers, alarm clocks, and connecting the engine .cooling fan	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
28	6	Knowledge and understanding	√	Accessory circuits and devices such as windshield wipers, alarms, and connecting the cooling . fan to the engine	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
29	6	Knowledge and understanding	√	Accessory circuits and devices such as windshield wipers, alarms, and connecting the cooling fan to the engine	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

32. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.						
First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	10	10	10	10	10	40

33. Learning and teaching resources	
Auto Electricity and Electronics Seventh Edition, Revised, Workbook . by Nancy Henke-Konopasek (Author), James E. Duff	Required textbooks (methodology, if any)
Introduction to Automotive Electrical and Electronic system . Rajesh Murukesan	Main references (sources)
كتاب كهرباء السيارات دليل الصيانة والإصلاح	Recommended supporting books and references (scientific journals, reports....)
https://media.defense.gov/2014/Jun/20/2002655900/-1/-1/1/140620-N-ZZ182-6548.pdf https://dl.icdst.org/pdfs/files/1bd36ee204b8e573c1217237854b8945.pdf	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: **Mechanical Engineering Techniques of Power**
Lecturer Name: Yasir Fayez Youssif
Scientific title: Assistant Lecturer
Academic qualification: Master
Work location: **Mechanical Engineering Techniques of Power**

Course Description Form 2023/2024

44-	Course Name	
		Diagnosis of malfunctions
45-	Course Code	
46-	Semester / Year	٢٠٢٤/٢٠٢٣
47-	Description Preparation Date:	٥/1/2024
48-	Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
49-	Number of study hours (total)/number of units (total)	60 hours within 30 weeks / 7 units
50-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
	Name: Eng. Yasser Fayez Yousef	
	Email:coj.yaserfa@atu.edu.iq	

20.Expected learning outcomes of the program

Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√

A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on various equipment	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults for automotive systems	√
D4	The ability to adapt to similar specializations (refrigeration and air conditioning engineering, renewable energies,)	√

21. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).

a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√

c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	√
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	√
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	√

34. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated subjects in the study of vehicle technology and keeping pace with the rapid scientific development through direct contact with decision-makers for vehicle engineering around the world and direct contact with colleges and institutes specialized in vehicle technology	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to factories, seminars, training and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging effective scientific participation and visits in conferences, technical meetings and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities	√

		Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

35. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Direct Evaluation Method	Indirect evaluation method
1-2	4	Knowledge understanding and ✓	Fundamentals of Computer Systems Cybernetics, computer features, digital electronics, integrated circuits, computer signals, computer system operation, sensors, computers, actuators.	The direct method through lectures. ✓	Written tests ✓	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills ✓		Self-method through the preparation of research papers and discussion collectively ✓	Oral exams ✓	Interviews or questionnaires to survey employers' opinions
		Thinking skills ✓		Scientific seminars on the most important research carried out in the field of specialization. ✓	Achievement files and performance evaluation ✓	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development) ✓		An interactive way by dividing students into small groups ✓	Projects & Observation ✓	External Evaluators
3-4	4	Knowledge understanding and ✓	On-board diagnostic and scanning tools Scan for computer problems, problem icons axis.	The direct method through lectures. ✓	Written tests ✓	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills ✓		Self-method through the preparation of research papers and discussion collectively ✓	Oral exams ✓	Interviews or questionnaires to survey employers' opinions
		Thinking skills ✓		Scientific seminars on the most important research carried out in the field of specialization. ✓	Achievement files and performance evaluation ✓	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development) ✓		An interactive way by dividing students into small groups ✓	Projects & Observation ✓	External Evaluators
5-6	4	Knowledge understanding and ✓	Computer System Initial visual inspection, computer system circuit problems, sensor and operator problems, sensor service, operator service,	The direct method through lectures. ✓	Written tests ✓	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills ✓		Self-method through the preparation of research papers and discussion ✓	Oral exams ✓	Interviews or questionnaires to survey

				computer service.	collectively			employers' opinions	
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
7	2	Knowledge and understanding	√	Engine performance and driving power Identify engine performance problems, typical performance problems.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
8-12	10	Knowledge and understanding	√	Advanced Diagnosis Vacuum and pressure measurement tests, vacuum pump tests, diesel engine test, advanced scanning tools, checking computer terminal values, electromagnetic interference isolation, using a digital pyrometer, finding performance problems related to temperature, using a force meter, using oscilloscope, using an oscilloscope, engine analyzer.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
13-14	4	Knowledge and understanding	√	Engine tuning	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey

				General Tuning Rules, Tuning Safety Rules, Standard Tuning Procedures, Diesel Engine Tuning (Maintenance), Engine Adjustment Intervals (Maintenance)					graduates' opinions	
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.	
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators	
15-16	4	Knowledge and understanding	√	Engine mechanical problems Why is diagnosis important? Symptoms of mechanical problems of the engine, determination of the type of engine repair required, evaluation of mechanical problems of the engine, manual troubleshooting schemes for the service.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.	
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators	
17-19	6	Knowledge and understanding	√	Removing the engine, disassembling it and cleaning parts Engine removal, engine disassembly, engine parts cleaning	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.	
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators	

		development)							
20-23	8	Knowledge understanding and	√	Engine Bottom End Service Cylinder block service, stabilizer shaft service, piston servicing, piston piston servicing, connecting rod service, piston ring service, crankshaft service, piston and rod assembly assembly, torque-to-yield bolts, engine balancing, engine final assembly.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
24-27	8	Knowledge understanding and	√	Top End Engine Service Cylinder Head Service, Diesel Combustion Chamber Service, Valve Guide Service, Valve Seat Refurbishment, Test Valve Assembly, Camshaft Service, Crane Service, Thrust Bar Service, Boom Assembly Service, Overhead Engine Reassembly, Valve Adjustment Valve Cover Installation.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
28-30	6	Knowledge understanding and	√	Front Engine Service & Engine Installation Timing Series, Gear Service, Front Crankshaft Seal Service, Front Cover Service, Timing Belt Service, Full Engine Assembly, Engine Stabilization, Engine Breakage	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.

		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators	
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36. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	۱۰	۱۰	۱۰	۱۰	۱۰	40

37. Learning and teaching resources

	Required textbooks (methodology, if any)
Halderman Advanced Engine Performance Diagnosis sixth edition	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical Engineering
Scientific title: Assistant Lecturer
Academic qualification: Master
Work location: Automobile engineering

Course Description Form 2023/2024

51-	Course Name
	Automotive Electronics and Computer Control
52-	Course Code
	ARE 449
53-	Semester / Year
	٢٠٢٤/٢٠٢٣
54-	Description Preparation Date:
	٢٠٢٤/٤/٧
55-	Available Attendance Forms:
	Lectures in the presence of students (Online if necessary)
56-	Number of study hours (total)/number of units (total)
	150 hours-30 week / 6 unit
57-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)
	A.L. Ahmed Dheyaa Jawad Rabeea

22. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work in specialized workshop in and out country	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in automobile systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,	√

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23. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

38. Objectives of the educational program: Given the rapid scientific and technological progress in the field of automobile technology, the Department of Automotive Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of automobile technology and keeping pace with rapid scientific development through direct contact with automobile engineering decision-makers all over the world and direct contact with colleges and institutes specialized in automobile technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to technical workshop, seminars, and training on specific workshops and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international factories administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic,	√

		artistic and religious fields with the teaching staff	
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

39. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	5	Knowledge and understanding	√	Introduction	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	5	Knowledge and understanding	√	Review of electronics	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
۳	۵	Knowledge and understanding	√	Tools and Equipment's	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۴	۵	Knowledge and understanding	√	Automotive sensors: Sensor Locations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
o	o	Knowledge and understanding	√	Automotive sensors: Sensor Classifications	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
6	o	Knowledge and understanding	√	Position sensors 1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
Y	o	Knowledge and understanding	√	Position sensors 2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
A	o	Knowledge and understanding	√	Speed and rpm sensors 1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

9	o	Knowledge and understanding	√	Speed and rpm sensors 2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	o	Knowledge and understanding	√	Acceleration/vibration sensors-1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	o	Knowledge and	√	Acceleration/vibration	The direct method is	√	Written tests	√	Interviews or	

		understanding		sensors-2	.through lectures			questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۱۲	◦	Knowledge and understanding	√	Force and torque sensors-1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۱۳	◦	Knowledge and understanding	√	Force and torque sensors-2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to

								survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٤	◦	Knowledge and understanding	√	Pressure sensors-1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٥	◦	Knowledge and understanding	√	Pressure sensors-2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√

								opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
١٦	◦	Knowledge and understanding	√	Flow sensors-1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٧	◦	Knowledge and understanding	√	Flow sensors-2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٨	◦	Knowledge and understanding	√	Temperature sensors-1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٩	◦	Knowledge and understanding	√	Temperature sensors-2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢٠	○	Knowledge and understanding	√	Other sensors	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢١	○	Knowledge and understanding	√	Automotive computers: Computer Names	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

					research papers and discussing them collectively			survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۲	◦	Knowledge and understanding	√	Automotive computers: Computer Locations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۳	◦	Knowledge and understanding	√	Actuators-1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

					discussing them collectively				opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٤	◦	Knowledge and understanding	√	Actuators-2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٥	◦	Knowledge and understanding	√	Control systems in automobiles	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢٦	٥	Knowledge and understanding	√	Engine management systems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢٧	٥	Knowledge and understanding	√	Electronic transmission control	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٨	○	Knowledge and understanding	√	Integration of engine management and transmission control systems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٩	○	Knowledge and understanding	√	Chassis control systems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

40. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	10	10	10	10	10	40

41. Learning and teaching resources

Automobile Systems and maintenance, lists of Airbus company	Required textbooks (methodology, if any)
Automobile Systems and maintenance, lists of Airbus company	Main references (sources)
Automobile Systems and maintenance, lists of Airbus company	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Department of power mechanics engineering
techniques
Scientific title: Assistant Lecturer
Academic qualification: Master
Work location: Department of power mechanics engineering
techniques

Course Description Form 2023/2024

58-	Course Name	English Language
59-	Course Code	ARE 449
60-	Semester / Year	٢٠٢٤/٢٠٢٣
61-	Description Preparation Date:	٢٠٢٤/٤/٧
62-	Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
63-	Number of study hours (total)/number of units (total)	30 hours-30 week / 2 unit
64-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Asst.Lect. Mohammed Salim Abdulameer

24. Expected learning outcomes of the program		
Knowledge and understanding		
A1	1. Develop their intellectual, personal and professional abilities.	√
A2	2. Develop their intellectual, personal and professional abilities.	√
A3	3. Acquire basic language skills (listening, speaking, reading and writing) in order to communication with speakers of English language.	√
A4	4. Develop positive attitudes towards learning English.	√
Subject-specific skills		
B1	Ability to work and integrate into Phonotic and reading	√
B2	Ability to write a sentences	√
B3	The ability to use modern techniques, in learning English	√
B4	Ability to understanding any shape and form in teaching English Language	√
thinking skills		
C1	1. Putting Language into practice through speaking.	√
C2	2. Being able to read Advertisements or English writing through developing reading skill.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work the form of Teaching English.	√
D2	Skill in rading and writing of English Languge.	√
D3	The ability to work with new generation for listen.	√

25. Teaching and Learning Strategies

Strategies	<p>1- Uses the available material to increase his efficiency.</p> <p>2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task.</p> <p>3- Defines basic Modals and employ them in elementary level of communication and writing skills.</p> <p>4- Develop and enhance students' language skills to communicate in English properly.</p> <p>5- Interprets the texts written in elementary level of English.</p>
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
1- Uses expressions of Quantity in elementary level of English.	√
2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task.	√
3- Defines basic Modals and employ them in elementary level of communication and writing skills.	
4- Translates sentences in elementary level from English to another language.	
5- Interprets the texts written in elementary level of English.	√

42. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A-	Maintaining	and	A1
1-The aim of this course is to provide English learners with integrated			√

improving the quality of the curriculum		language skills such as reading, listening and writing resulting in a level of basic language knowledge.	
	A2	2-This course will focus on grammar rules, basic word knowledge and usage, reading comprehension, reading out of the lesson, and Paragraph writing.	√
	A3	3- A student may be able to listen to native speakers and speak English Language.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all English language specializations (technology incubator)	√

43. Course structure

Week	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Direct assessment method	Indirect assessment method
1	1	Cognitive output	Introduction in English Language	Lecture	Homework & Quizzes	Interviews or questionnaires to survey graduates' opinions
		Cognitive output		Discussion	Homework & Quizzes	Interviews or questionnaires to survey employers' opinions
		Cognitive output		Lecture	Homework & Quizzes	Interviews or questionnaires to survey student opinions
		Knowledge and skills		Discussion	Homework & Quizzes	external assessmeters
2	1	Cognitive output	Using of Negative form in English Language.	Lecture	Homework & Quizzes	Interviews or questionnaires to survey graduates' opinions
		Knowledge and skills		Discussion	Homework & Quizzes	Interviews or questionnaires to survey employers' opinions
		Cognitive output		Lecture	Homework & Quizzes	Interviews or questionnaires to survey student opinions.

		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
3-4	)	Cognitive output	√	English key words in Mechanical Engineering Techniques of Power Department.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
5	)	Cognitive output	√	The present simple tense + Synonyms The past perfect tense + Synonyms	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	

6	)	Cognitive output	√	What are auxiliary .verbs? + Presentation	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
7-10	)	Cognitive output	√	English Adjective.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	

11	1	Cognitive output	√	English key words in Mechanical Engineering Techniques of Power Department	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
12-14	1	Cognitive output	√	Paraphrasing English Language + Presentation.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
15	1	Cognitive output	√	.Exam	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	

16-18	✓	Cognitive output	✓	Summarizing English .Language	Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey graduates' opinions	
19-22	✓	Cognitive output	✓	Quotations English Language.	Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	✓		Discussion	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	✓		Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	✓		Discussion	✓	Homework & Quizzes		external assessmeters	
23	✓	Cognitive output	✓	Simile and Metaphor in English Language..	Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	✓		Discussion	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	✓		Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	✓		Discussion	✓	Homework & Quizzes		external assessmeters	

24	1	Cognitive output	√	Opposites + Presentation	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	√
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	√
25	1	Cognitive output	√	Using of question form in English Language.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
26	1	Cognitive output	√	Unity and Coherence.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
27-29	1	Cognitive output	√	Passive Voice.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework &	√	Interviews or	

						Quizzes		questionnaires to survey employers' opinions	
30		Cognitive output	√	Review		Homework & Quizzes			

First semester/theoretical	Second/theoretical semester	Work of the year/activities and absences	Final/theoretical exam
20	20	10	50

44. Learning and teaching resources

Intermediate Headway Student Book

By: John Soars & Liz Soars

- Alexander, L G. Developing Skills: Student's Book (New Concept English)

- Raymond, Murphy. English Grammar in Use (2nd ed.). Cambridge University Press.

Google Books

Google Scholar

engvid.com

Required textbooks (methodology, if any)

Main references (sources)

Recommended supporting books and references
(scientific journals, reports....)

Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific
Evaluation Apparatus
Directorate of Quality Assurance and
Academic Accreditation
Accreditation Department**



University name: Al-Furat Al-Awsat University
College name: Najaf Engineering Technical College
Department: Engineering Technical Mechanics of Power
Lecturer's name: Haider Ali Abdul Hussein
Scientific title: teacher
Academic qualification: Master's degree
Workplace: Engineering Technical Mechanics of Power

Course description form for the academic year 2023/2024

1- Name of the course			
Machine theory			
2- Course code			
3- Academic year:			
2023/2024			
4- Date this description was prepared:			
6/27/2024			
5- Available forms of attendance:			
Lecture in person (electronically if necessary)			
6- Number of study hours (total)/number of units (total)			
90 hours over 30 weeks / 6 units			
7- Name of the course administrator (if there is more than one teaching staff, all their names will be mentioned)			
M. Haider Ali Abdul Hussein			
8- Course outcomes (outputs derived from the educational program outcomes of the Aviation Technology Engineering Department)			
	Definition of machine and basic components of machines.	1 a	A- Knowledge and understanding
√	Types of machines and their uses in daily and industrial life.	2a	
√	Types of movements (linear, periodic, rotational).	3a	
√	Use specialized software to analyze and design machines.	4A	
√	The ability to analyze the mechanical motion of machines and understand the relationships between speed, acceleration, and forces.	1 b	B- Subject-specific skills
	Use kinematics and dynamics principles to solve practical problems related to machine movement.	2 b	
√	Develop the ability to design machine components such as gears, cams, and levers.	3 b	
√	Apply theoretical knowledge in designing efficient and safe mechanical systems.	4 b	
√	Ability to accurately analyze mechanical problems and identify root causes.	1 c	C- Thinking skills

√	Critically evaluate proposed designs and solutions to ensure their effectiveness and efficiency.	2 c	D- General and transferable skills (other skills related to employability and personal development)
√	Ask important questions and test assumptions to ensure the results are valid.	3 c	
√	Creating new and unconventional solutions to mechanical problems.	4 c	
√	Speak confidently and effectively in meetings and seminars.	1 d	
√	Ability to communicate effectively with colleagues and clients.	2 d	
√	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	3 d	
√	The ability to lead work teams and direct efforts towards achieving goals.	4 d	

Teaching and learning strategies - ١٥	
Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students	The strategy

10-Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Federation of Engineers (IEA)	
√	A - Apply basic principles of mathematics, natural sciences, and engineering concepts to solve engineering problems.
√	B- Design experiments related to technical engineering, conduct them effectively, and analyze and interpret the results to reach useful conclusions.
	T- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.
	D- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.
√	C- Works effectively as a member or leader in a specialized engineering team.
√	H-Identifies, analyzes and solves large-scale engineering problems.
√	G - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.
√	D- Participates in self-directed continuing professional development.
√	I- Works to understand and adhere to professional and ethical responsibilities.
√	T- He works to understand the impact of solutions to engineering problems locally and globally and applies them in his field of specialization.
√	G- Cooperation and teamwork with individuals from different technical and professional backgrounds to achieve common goals.

10-Objectives of the educational program: Due to the rapid scientific and technological progress in the field of mechanical technology, the Power Mechanics Technology Engineering Department is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear			
√	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with decision-makers for mechanical engineering in all parts of the world and direct contact with .colleges and institutes specialized in the field of mechanical engineering	1a	a-Maintaining and improving the quality of the curriculum
√	.Continuous evaluation and development of curricula	2a	
√	.Linking student projects and research to community needs	3a	
√	Expanding students' concepts through field visits to domestic airports, .seminars, and training on airport runways and maintenance workshops	4A	
√	Students use the latest modern laboratory and programming technologies	b\	B- Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled .technicians
√	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	1t	A- Providing the best university environment for faculty and students
√	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	Th1	A- Maintaining the technical development of faculty members
√		W2	
√	Continuous review and evaluation of student and faculty activities	W3	
√	Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	C1	B- Knowledge production
√	Conducting distinguished theoretical and applied research for students with the faculty	C2	
√	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	C3	
√	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	H1	T- Initiatives
√	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	X1	D- Activating and strengthening ties with public

√	Organizing conferences, seminars and educational courses	X2	government agencies and the private sector
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Course structure - ۲									
method	Indirect assessment	Direct assessment method	method	Name of the unit or topic Learning	outcomes	Hours Required	Week learning		
	Interviews or questionnaires to survey graduates' opinions		Written tests ✓	The direct method is through lectures.	Dynamics	✓	Knowledge and understanding	۳	۱
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams ✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.		Completion files and performance evaluation ✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation ✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests ✓	The direct method is through lectures.		✓	Knowledge and understanding		
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams ✓	The subjective method is through preparing research papers and discussing them collectively	✓	Subject-specific skills	۳	۲	
	Interviews or	✓	Completion files and	Scientific seminars on the	✓	thinking skills			

	questionnaires to survey student opinions.		performance evaluation	most important research carried out in the field of specialization.						
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)			
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Velocity	✓	Knowledge and understanding	۳		
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills			
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills			
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)			
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.		Acceleration	✓		Knowledge and understanding	۳
	Interviews or questionnaires to survey employers'	✓	Oral exams	The subjective method is through preparing research papers and discussing them			✓		Subject-specific skills		۴

	opinions			collectively				
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.	✓	thinking skills	
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups	✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Equilibrium	Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		thinking skills	
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.		Knowledge and understanding	
	Interviews or	✓	Oral exams	✓	The subjective method is	✓	Subject-specific skills	۶

	questionnaires to survey employers' opinions			through preparing research papers and discussing them collectively						
	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	√	Scientific seminars on the most important research carried out in the field of specialization.		√	thinking skills		
	External evaluators		Projects and observation	√	An interactive method by dividing students into small groups		√	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	√	Written tests	√	The direct method is through lectures.	Gears	√	Knowledge and understanding	۳	
	Interviews or questionnaires to survey employers' opinions	√	Oral exams	√	The subjective method is through preparing research papers and discussing them collectively		√	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	√	Scientific seminars on the most important research carried out in the field of specialization.		√	thinking skills		
	External evaluators		Projects and observation	√	An interactive method by dividing students into small groups		√	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates'	√	Written tests	√	The direct method is through lectures.		√	Knowledge and understanding		۳
	Interviews or questionnaires to survey graduates'	√	Written tests	√	The direct method is through lectures.		mechanical components. Gears consist of cross-connected teeth used to	√		Knowledge and understanding	۳

	opinions				transfer motion between axes.				
	Interviews or questionnaires to survey employers' opinions	√	Oral exams	The subjective method is through preparing research papers and discussing them collectively		√	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	Scientific seminars on the most important research carried out in the field of specialization.		√	thinking skills		
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		√	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	√	Written tests	The direct method is through lectures.	Planetary Gears	√	Knowledge and understanding	۳	۹
	Interviews or questionnaires to survey employers' opinions	√	Oral exams	The subjective method is through preparing research papers and discussing them collectively		√	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	Scientific seminars on the most important research carried out in the field of specialization.		√	thinking skills		
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		√	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or	√	Written tests	The direct method is		√	Knowledge and			۳	۱۰

	questionnaires to survey graduates' opinions			through lectures.	Gears		understanding			
	Interviews or questionnaires to survey employers' opinions	✓	✓	Oral exams			✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	✓	Completion files and performance evaluation			✓	thinking skills		
	External evaluators		✓	Projects and observation			✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	✓	Written tests	Planetary Gears.	✓	Knowledge and understanding	۳	۱۱	
	Interviews or questionnaires to survey employers' opinions	✓	✓	Oral exams			✓			Subject-specific skills
	Interviews or questionnaires to survey student opinions.	✓	✓	Completion files and performance evaluation			✓			thinking skills
	External evaluators		✓	Projects and observation			✓			Generic and transferable skills (other skills related to employability and personal

							development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	mechanical components. Gears consist of cross-	✓	Knowledge and understanding	۳	۱۲
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Belts	✓	Knowledge and understanding	۳	۱۳
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to		

						employability and personal development)				
	Interviews or questionnaires to survey graduates' opinions	√	Written tests	√	The direct method is through lectures.	Clutches	√	Knowledge and understanding	۳	۱۴
	Interviews or questionnaires to survey employers' opinions	√	Oral exams	√	The subjective method is through preparing research papers and discussing them collectively		√	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	√	Scientific seminars on the most important research carried out in the field of specialization.		√	thinking skills		
	External evaluators		Projects and observation	√	An interactive method by dividing students into small groups		√	Generic and transferable skills (other skills related to employability and personal development)		
√	Interviews or questionnaires to survey graduates' opinions	√	Written tests	√	The direct method is through lectures.	Vibrations	√	Knowledge and understanding	۳	۱۰
√	Interviews or questionnaires to survey employers' opinions	√	Oral exams	√	The subjective method is through preparing research papers and discussing them collectively		√	Subject-specific skills		
√	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	√	Scientific seminars on the most important research carried out in the field of specialization.		√	thinking skills		

✓	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Static Friction	✓		۳	۱۶
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓			
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓			
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓			
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Static Friction	✓	Knowledge and understanding	۳	۱۷
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		

	External evaluators		Projects and observation	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Dynamic Friction	Knowledge and understanding	۳	۱۸
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	Scientific seminars on the most important research carried out in the field of specialization.		thinking skills		
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Coefficient of Friction	Knowledge and understanding	۳	۱۹
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills		
	Interviews or questionnaires to	✓	Completion files and performance	Scientific seminars on the most important research carried out in the field of		thinking skills		

	survey student opinions.		evaluation	specialization.				
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Energy Dissipation	✓	Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills	
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.		✓	Knowledge and understanding	
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	۲۱
					Lubrication Coefficient			۳

Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Surface Lubrication.	✓	Knowledge and understanding	۳	۲۲
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.		✓	Knowledge and understanding		
Interviews or questionnaires to	✓	Oral exams	✓	The subjective method is through preparing research papers and	✓	Subject-specific skills	۳	۲۳	

	survey employers' opinions			discussing them collectively				
	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	√	Scientific seminars on the most important research carried out in the field of specialization.	√	thinking skills	
	External evaluators		Projects and observation	√	An interactive method by dividing students into small groups	√	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	√	Written tests	√	The direct method is through lectures.	√	Knowledge and understanding	
	Interviews or questionnaires to survey employers' opinions	√	Oral exams	√	The subjective method is through preparing research papers and discussing them collectively	√	Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	√	Completion files and performance evaluation	√	Scientific seminars on the most important research carried out in the field of specialization.	√	thinking skills	۳
	External evaluators		Projects and observation	√	An interactive method by dividing students into small groups	√	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	√	Written tests	√	The direct method is through the lecturer	√	Knowledge and understanding	۳

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	survey graduates' opinions				represents					
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓		The direct method is through lectures.	✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓		The subjective method is through preparing research papers and discussing them collectively	✓	thinking skills		
	External evaluators		Projects and observation	✓		Scientific seminars on the most important research carried out in the field of specialization.	✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	Cams & Accessories Cam & Rollers	✓	Knowledge and understanding		
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills	۳	۲۸
	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)		

	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	Static Balancing	✓	Knowledge and understanding	۳	۲۹
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills		
	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)		
✓	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	Static Balancing	✓	Knowledge and understanding	۳	۳۰
✓	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills		
✓	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills		
✓	External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and		

							personal development)		
	Interviews or questionnaires to survey graduates' opinions		Written tests	An interactive method by dividing students into small groups					

-٣						
Final/theoretical exam	Final/practical exam	year works? Activities and absences	Second/practical semester	Second/theoretical semester	semester/practical	The first semester/theoretical.
٤٠	١٠	١٠	١٠	١٠	١٠	١٠

Learning and teaching resources -٤	
Theory of Machines بقلم "R.S. Khurmi و J.K.	Required textbooks (methodology, if any)
Mechanical Engineering Design بقلم Joseph E. Shigley و Charles R. Mischke و Richard G. Budynas.	Main references (sources)
. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.	Recommended supporting books and references (scientific journals, reports....)
You Tube, orthographic projection of lines and plane surfaces	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific
Evaluation Apparatus
Directorate of Quality Assurance and
Academic Accreditation
Accreditation Department**



University name: Al-Furat Al-Awsat University
College name: Najaf Engineering Technical College
Department Mechanical Technical Engineering of
Power
Lecturer's name: Haider Ali Abdul Hussein
Scientific title: teacher
Academic qualification: Master's degree
Workplace: Engineering Technical Mechanics of Power

Course description form for the academic year 2023/2024

1- Name of the course			
Machine theory			
2- Course code			
3- Academic year:			
2023/2024			
4- Date this description was prepared:			
6/27/2024			
5- Available forms of attendance:			
Lecture in person (electronically if necessary)			
6- Number of study hours (total)/number of units (total)			
90 hours over 30 weeks / 6 units			
7- Name of the course administrator (if there is more than one teaching staff, all their names will be mentioned)			
M. Haider Ali Abdul Hussein			
8- Course outcomes (outputs derived from the educational program outcomes of the Aviation Technology Engineering Department)			
	Definition of machine and basic components of machines.	1 a	A- Knowledge and understanding
√	Types of machines and their uses in daily and industrial life.	2a	
√	Types of movements (linear, periodic, rotational).	3a	
√	Use specialized software to analyze and design machines.	4A	B- Subject-specific skills
√	The ability to analyze the mechanical motion of machines and understand the relationships between speed, acceleration, and forces.	1 b	
	Use kinematics and dynamics principles to solve practical problems related to machine movement.	2 b	
√	Develop the ability to design machine components such as gears, cams, and levers.	3 b	
√	Apply theoretical knowledge in designing efficient and safe mechanical systems.	4 b	C- Thinking skills
√	Ability to accurately analyze mechanical problems and identify root	1 c	

	causes.		
√	Critically evaluate proposed designs and solutions to ensure their effectiveness and efficiency.	2 c	
√	Ask important questions and test assumptions to ensure the results are valid.	3 c	
√	Creating new and unconventional solutions to mechanical problems.	4 c	
√	Speak confidently and effectively in meetings and seminars.	1 d	D- General and transferable skills (other skills related to employability and personal development)
√	Ability to communicate effectively with colleagues and clients.	2 d	
√	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	3 d	
√	The ability to lead work teams and direct efforts towards achieving goals.	4 d	

Teaching and learning strategies -٦٦	
Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that .include some sampling activities of interest to students	The strategy

10-Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for .Engineering and Technology (ABET), and the International Federation of Engineers (IEA)	
√	A - Apply basic principles of mathematics, natural sciences, and engineering concepts to solve engineering problems.
√	B- Design experiments related to technical engineering, conduct them effectively, and analyze and interpret the results to reach useful conclusions.
	T- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.
	D- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.
√	C- Works effectively as a member or leader in a specialized engineering team.
√	H-Identifies, analyzes and solves large-scale engineering problems.
√	G - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.
√	D- Participates in self-directed continuing professional development.
√	I- Works to understand and adhere to professional and ethical responsibilities.
√	T- He works to understand the impact of solutions to engineering problems locally and globally and applies them in his field of specialization.
√	G- Cooperation and teamwork with individuals from different technical and professional backgrounds to achieve common goals.

10-Objectives of the educational program: Due to the rapid scientific and technological progress in the field of mechanical technology, the Power Mechanics Technology Engineering Department is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear			
√	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with decision-makers for mechanical engineering in all parts of the world and direct contact with .colleges and institutes specialized in the field of mechanical engineering	1a	a-Maintaining and improving the quality of the curriculum
√	.Continuous evaluation and development of curricula	2a	
√	.Linking student projects and research to community needs	3a	
√	Expanding students' concepts through field visits to domestic airports, .seminars, and training on airport runways and maintenance workshops	4A	
√	Students use the latest modern laboratory and programming technologies	b\	B- Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled .technicians
√	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	1t	A- Providing the best university environment for faculty and students
√	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	Th1	A- Maintaining the technical development of faculty members
√		W2	
√	Continuous review and evaluation of student and faculty activities	W3	
√	Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	C1	B- Knowledge production
√	Conducting distinguished theoretical and applied research for students with the faculty	C2	
√	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	C3	
√	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	H1	T- Initiatives
√	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	X1	D- Activating and strengthening ties with public government agencies and the private sector
√	Organizing conferences, seminars and educational courses	X2	

Course structure - ۲								
method	Indirect assessment	Direct assessment method	method	Name of the unit or topic Learning	outcomes	Hours Required	Week learning	
	Interviews or questionnaires to survey graduates' opinions		Written tests ✓	The direct method is through lectures.	Dynamics	Knowledge and understanding ✓	۳	۱
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams ✓	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills ✓		
	Interviews or questionnaires to survey student opinions.		Completion files and performance evaluation ✓	Scientific seminars on the most important research carried out in the field of specialization.		thinking skills ✓		
	External evaluators		Projects and observation ✓	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development) ✓		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests ✓	The direct method is through lectures.	Kinetics	Knowledge and understanding ✓	۳	۲
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams ✓	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills ✓		
	Interviews or questionnaires to	✓	Completion files and performance ✓	Scientific seminars on the most important research carried out in the field of		thinking skills ✓		

	survey student opinions.		evaluation	specialization.				
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Velocity	✓	Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills	
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.		✓	Knowledge and understanding	
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively	✓	Subject-specific skills	۳	۴

	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Equilibrium	✓	Knowledge and understanding	۳	۵
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.			Knowledge and understanding		
	Interviews or questionnaires to	✓	Oral exams	✓	The subjective method is through preparing research papers and	Cams	✓	Subject-specific skills	۳	۶

	survey employers' opinions			discussing them collectively				
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.	✓	thinking skills	
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups	✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Gears	Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		thinking skills	
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.		Knowledge and understanding	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	mechanical components. Gears consist of cross-connected teeth used to transfer motion between	Knowledge and understanding	۳

Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively	axes.	✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Planetary Gears	✓	Knowledge and understanding	۳	۹
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to	✓	Written tests	✓	The direct method is through lectures.		Gears	✓			Knowledge and understanding	۳	۱۰

	survey graduates' opinions								
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively	✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.	✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups	✓	Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Planetary Gears.	✓	Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills	
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	

Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	mechanical components. Gears consist of cross-	✓	Knowledge and understanding	۳	۱۲
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Belts	✓	Knowledge and understanding	۳	۱۳
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and		

							personal development)			
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Clutches	✓	Knowledge and understanding	۳	۱۴
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
✓	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Vibrations	✓	Knowledge and understanding	۳	۱۰
✓	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
✓	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
✓	External evaluators		Projects and	✓	An interactive method by dividing students into		✓	Generic and transferable skills		

			observation	small groups			(other skills related to employability and personal development)			
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Static Friction	✓		۳	۱۶
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓			
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓			
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓			
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Static Friction	✓	Knowledge and understanding	۳	۱۷
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
	External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to		

							employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Dynamic Friction	✓	Knowledge and understanding	۳	۱۸
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Coefficient of Friction	✓	Knowledge and understanding	۳	۱۹
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		

	External evaluators		Projects and observation	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Energy Dissipation	Knowledge and understanding	۳	۲۰
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills		
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	Scientific seminars on the most important research carried out in the field of specialization.		thinking skills		
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		Generic and transferable skills (other skills related to employability and personal development)		
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Lubrication Coefficient	Knowledge and understanding	۳	۲۱
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		Subject-specific skills		
	Interviews or questionnaires to	✓	Completion files and performance	Scientific seminars on the most important research carried out in the field of		thinking skills		

	survey student opinions.		evaluation	specialization.				
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Surface Lubrication.	✓	Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills	
	Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills	
	External evaluators		Projects and observation	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.		✓	Knowledge and understanding	
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively	✓	Subject-specific skills	۲۲	
	Interviews or questionnaires to survey graduates' opinions	✓	Written tests	The direct method is through lectures.	Durability	✓	Knowledge and understanding	۳
	Interviews or questionnaires to survey employers' opinions	✓	Oral exams	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		۲۳

Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through lectures.	Periodic Maintenance	✓	Knowledge and understanding	۳	۲۴
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The subjective method is through preparing research papers and discussing them collectively		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	thinking skills		
External evaluators		Projects and observation	✓	An interactive method by dividing students into small groups		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	The direct method is through the lecturer		✓	Knowledge and understanding		
Interviews or questionnaires to	✓	Oral exams	✓	The direct method is through lectures.	✓	Subject-specific skills	۳	۲۰	

survey employers' opinions									
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills		
External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	A gyroscope	✓	Knowledge and understanding	۳	۲۶
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills		
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills		
External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)		
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups		✓	Knowledge and understanding			۳	۲۷

Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills					
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills					
External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)					
Interviews or questionnaires to survey graduates' opinions	✓	Written tests	✓	An interactive method by dividing students into small groups	Cams & Accessories Cam & Rollers	✓	Knowledge and understanding	۳	۲۸			
Interviews or questionnaires to survey employers' opinions	✓	Oral exams	✓	The direct method is through lectures.		✓	Subject-specific skills					
Interviews or questionnaires to survey student opinions.	✓	Completion files and performance evaluation	✓	The subjective method is through preparing research papers and discussing them collectively		✓	thinking skills					
External evaluators		Projects and observation	✓	Scientific seminars on the most important research carried out in the field of specialization.		✓	Generic and transferable skills (other skills related to employability and personal development)					
Interviews or questionnaires to	✓	Written tests	✓	An interactive method by dividing students into small groups		Static Balancing	✓			Knowledge and understanding	۳	۲۹

Interviews or questionnaires to survey graduates' opinions		Written tests	An interactive method by dividing students into small groups				
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Final/theoretical exam	Final/practical exam	year works? Activities and absences	Second/practical semester	Second/theoretical semester	semester/practical	The first semester/theoretical.
٤٠	١٠	١٠	١٠	١٠	١٠	١٠

Learning and teaching resources -٤	
Theory of Machines بقلم "R.S. Khurmi و J.K.	Required textbooks (methodology, if any)
Mechanical Engineering Design بقلم Joseph E. Shigley و Charles R. Mischke و Richard G. Budynas.	Main references (sources)
. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.	Recommended supporting books and references (scientific journals, reports....)
You Tube, orthographic projection of lines and plane surfaces	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical of Power technology engineering
Scientific title: Assist. Professor
Academic qualification: Doctorate
Work location: Aeronautical technology engineering

Course Description Form 2023/2024

67-	Course Name	Mechanical Design I
68-	Course Code	
69-	Semester / Year	2024/2023
70-	Description Preparation Date:	11/6/2024
71-	Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
72-	Number of study hours (total)/number of units (total)	90 hours-30 week / 7 unit
73-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Assist.Prof. Dr. Ahmed Hammodi Ali

26. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching practical leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,	√

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27. Teaching and Learning Strategies	
<u>Strategies</u>	In-person lectures, some electronic and video lectures as additional explanations, identifying and diagnosing problems through explanations, exercises and classroom exercises, practical applications for students to realize how to benefit from the specifications used and understand their application.

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

45. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√

E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

46. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	1. Introduction. 2. Loads. 3. Stress. 4. Strain. 5. Tensile Stress and Strain. 6. Compressive Stress and Strain. 7. Young's Modulus or Modulus of Elasticity. 8. Shear Stress and Strain 9. Shear Modulus or Modulus of Rigidity. 10. Bearing Stress.	The direct method is .through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student .opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	2	Knowledge and understanding	√	1. Stress-strain Diagram. 2. Working Stress 3. Stresses in Composite Bars. 4. Stresses Due to Change in Temperature 5. Thermal Stresses. 6. Poisson's Ratio. 7. Factor of safety	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
۳	۳	Knowledge and understanding	√	1. standard sections and their dimensions according to international and standard classification 2.using tables and relationships to identify cross sectional properties. 3. Impact Stress	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۴	۳	Knowledge and understanding	√	1. Tensile stress 2. compressive stresses 3. radius of rotation 4. stress concentration (calculation of tensile and torsional stresses for mechanical parts of different sections with estimation to find the best standard section).	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
o	r	Knowledge and understanding	√	1. Bending analysis 2. Bending stress 3. horizontal shear stress	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	4. optimal use of steel to carry bending 5. quick way to find the cutting modulus and moment of inertia	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
6	r	Knowledge and understanding	√	1. Theories of Failure Under Static Load 2. Maximum Principal or Normal Stress Theory (Rankine's Theory).	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	3. Maximum Shear Stress Theory (Guest's or Tresca's Theory). 4. Maximum Principal Strain Theory (Saint Venant's Theory).	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	5. Maximum strain Energy Theory (Haigh's Theory).	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√	6. Maximum Distortion Energy Theory (Hencky and Von Mises Theory)	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
γ	۳	Knowledge and understanding	√	1. Variable Stresses in Machine Parts 2. Completely Reversed or Cyclic Stresses. 3. Fatigue and Endurance Limit.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	4. Effect of Loading on Endurance Limit—Load Factor. 5. Effect of Surface Finish on Endurance Limit—Surface Finish Factor.	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	6. Effect of Size on Endurance Limit—Size Factor.	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	7. Relation Between Endurance Limit and Ultimate Tensile Strength Stress Concentration. 8. Theoretical or Form Stress Concentration Factor. 9. Stress Concentration due to Holes and Notches. 10. Methods of Reducing Stress Concentration.	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
λ	۳	Knowledge and understanding	√	1. Stress Concentration Factor for Various Machine Members. 2. Fatigue Stress Concentration Factor.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	3. Notch Sensitivity. 4. Combined Steady and Variable Stresses. 5. Gerber Method for Combination of Stresses.	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√	6. Goodman Method for Combination of Stresses. 7. Soderberg Method for Combination of Stresses. 8. Combined Variable Normal Stress and Variable Shear Stress. 9. Application of Soderberg's Equation.	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
9	3	Knowledge and understanding	√	1. Pressure Vessels 2. Classification of Pressure Vessels. 3. Stresses in a Thin Cylindrical Shell due to an Internal Pressure. 4. Circumferential or Hoop Stress. 5. Longitudinal Stress. 6. Change in Dimensions of a Thin Cylindrical Shell due to an Internal Pressure. 7. Thin Spherical Shells Subjected to an Internal Pressure. 8. Change in Dimensions of a Thin Spherical Shell due to an Internal Pressure.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	3	Knowledge and understanding	√	1. Thick Cylindrical Shell Subjected to an Internal Pressure. 2. Compound Cylindrical Shells. 3. Stresses in Compound Cylindrical Shells. 4. Cylinder Heads and Cover Plates	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

					most important research carried out in the field of .specialization		and performance assistant		questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۱	3	Knowledge and understanding	√	1. Riveted Joints 2. Methods of Riveting. 3. Material of Rivets. 4. Essential Qualities of a Rivet. 5. Manufacture of Rivets. 6. Types of Rivet Heads. 7. Types of Riveted Joints. 8. Lap Joint. 9. Butt Joint. 10. Important Terms Used in Riveted Joints. 11. Caulking and Fullering.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۲	3	Knowledge and understanding	√	1. Failures of a Riveted Joint. 2. Strength of a Riveted Joint. 3. Efficiency of a Riveted Joint. 4. Riveted Joint for Structural Use – Joints of Uniform Strength (Lozenge Joint). 5. Eccentric Loaded Riveted Joint.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research	√	Completion files and performance	√	Interviews or questionnaires to	

					carried out in the field of .specialization		assistant		survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۳	3	Knowledge and understanding	√	1.Design of Boiler Joints. 2. Assumptions in Designing Boiler Joints. 3. Design of Longitudinal Butt Joint for a Boiler. 4. Design of Circumfer. Lap Joint for a Boiler. 5. Recommended Joints for Pressure Vessels.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
14	3	Knowledge and understanding	√	1. Welded Joints 2. Advantages and Disadvantages of Welded Joints over Riveted Joints. 3. Welding Processes. 4. Fusion Welding. 5. Thermit Welding. 6. Gas Welding. 7. Electric Arc Welding. 8. Forge Welding. 9. Types of Welded Joints. 10. Lap Joint.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student	

		Generic and transferable skills (other skills related to employability and personal development)	√	11. Butt Joint. 12. Basic Weld Symbols.	.specialization An interactive method by dividing students into small groups	√	Projects and observation	opinions. external assessmeters		
15	۳	Knowledge and understanding	√	1. Supplementary Weld Symbols. 2. Elements of a Weld Symbol. 3. Standard Location of Elements of a Welding Symbol.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
		Subject-specific skills	√	4. Strength of Transverse Fillet Welded Joints. 5. Strength of Parallel Fillet Welded Joints.	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√	6. Special Cases of Fillet Welded Joints. 7. Strength of Butt Joints 8. Stresses for Welded Joints.	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√	9. Stress Concentration Factor for Welded Joints. 10. Axially Loaded Unsymmetrical Welded Sections Welds.	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
16	۳	Knowledge and understanding	√	1. Keys and Coupling 2. Types of Keys. 3. Sunk Keys. 4. Saddle Keys.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√	5. Tangent Keys. 6. Round Keys. 7. Splines. 8. Forces acting on a Sunk Key. 9. Strength of a Sunk Key.	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√	10. Effect of Keyways. 11. Shaft Couplings.	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۷	۳	Knowledge and understanding	√	1. Requirements of a Good Shaft Coupling. 2. Types of Shaft Couplings. 3. Sleeve Coupling. 4. Clamp or Compression Coupling. 5. Flange Coupling. 6. Design of Flange Coupling. 7. Flexible Coupling. 8. Bushed Pin Flexible Coupling. 9. Oldham Coupling. 10. Universal Coupling.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۸	۳	Knowledge and understanding	√	1. Shafts 2. Material Used for Shafts. 3. Manufacturing of Shafts. 4. Types of Shafts. 5. Standard Sizes of Transmission Shafts. 6. Stresses in Shafts. 7. Maximum Permissible Working Stresses for Transmission Shafts.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
١٩	٣	Knowledge and understanding	√	1. Design of Shafts. 2. Shafts Subjected to Twisting Moment Only. 3. Shafts Subjected to Bending Moment Only. 4. Shafts Subjected to Combined Twisting Moment and Bending Moment.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢٠	٣	Knowledge and understanding	√	1. Shafts Subjected to Fluctuating Loads. 2. Shafts Subjected to Axial Load in addition to Combined Torsion and Bending Loads. 3. Design of Shafts on the Basis of Rigidity.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
۲۱	۳	Knowledge and understanding	√	1. Power Screws 2. Types of Screw Threads used for Power Screws. 3. Multiple Threads. 4. Torque Required to Raise Load by Square Threaded Screws. 5. Torque Required to Lower Load by Square Threaded Screws. 6. Efficiency of Square Threaded Screws. 7. Maximum Efficiency of Square Threaded Screws. 8. Efficiency vs. Helix Angle.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۲	۳	Knowledge and understanding	√	1. Overhauling and Self-locking Screws. 2. Efficiency of Self Locking Screws. 3. Coefficient of Friction. 4. Acme or Trapezoidal Threads. 5. Stresses in Power Screws. 6. Design of Screw Jack. 7. Differential and Compound Screws.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
۲۳	۳	Knowledge and understanding	√	1. Screwed Joints 2. Advantages and Disadvantages of Screwed Joints. 3. Important Terms used in Screw Threads. 4. Forms of Screw Thread 5. Location of Screwed Joints. 6. Common Types of Screw Fastenings. 7. Locking Devices.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۴	۳	Knowledge and understanding	√	1. Designation of Screw Threads. 2. Standard Dimensions of Screw Threads. 3. Stresses in Screwed Fastening due to Static Loading. 4. Initial Stresses due to Screwing Up Forces. 5. Stresses due to External Forces.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

۲۵	۲	Knowledge and understanding	√	1. Stress due to Combined Forces. 2. Design of Cylinder Covers. 3. Boiler Stays. 4. Bolts of Uniform Strength. 5. Design of a Nut.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۶	۳	Knowledge and understanding	√	1. Cotter and Knuckle Joints 2. Types of Cotter Joints. 3. Socket and Spigot Cotter Joint. 4. Design of Socket and Spigot Cotter Joint. 5. Sleeve and Cotter Joint. 6. Design of Sleeve and Cotter Joint.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۷	۳	Knowledge and understanding	√	1. Gib and Cotter Joint.	The direct method is	√	Written tests	√	Interviews or	

		understanding		2. Design of Gib and Cotter Joint for Strap End of a Connecting Rod. 3. Design of Gib and Cotter Joint for Square Rods. 4. Design of Cotter Joint to Connect Piston Rod and Crosshead. 5. Design of Cotter Foundation Bolt.	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۸	۳	Knowledge and understanding	√	1. Knuckle Joint. 2. Dimensions of Various Parts of the Knuckle Joint. 3. Methods of Failure of Knuckle Joint. 4. Design Procedure of Knuckle Joint. 5. Adjustable Screwed Joint for Round Rods (Turn Buckle). 6. Design of Turn Buckle.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۹	۳	Knowledge and understanding	√	1. Pipes. 2. Stresses in Pipes.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				3. Design of Pipes. 4. Pipe Joints. 5. Standard Pipe Flanges for Steam. 6. Hydraulic Pipe Joint for High Pressures.				survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
		Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
۳۰	۳	Subject-specific skills	√	1. Pipe Joints 2. Design of Circular Flanged Pipe Joint. 3. Design of OvalFlanged Pipe Joint. 4. Design of Square Flanged Pipe Joint	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
		Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√

47. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.						
First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	10	10	10	10	10	40

48. Learning and teaching resources	
R.S.KHURMI AND J.K.GUPTA tortuka “A Textbook of Machine Design “	Required textbooks (methodology, if any)
1. Joseph Edward “Mechanical Engineering “Design” 1963 2.Peter Childs., “Mechanical Design Engineering Handbook”, Sep 2, 2013.	Main references (sources)
Shigley's Mechanical Engineering Design https://books.google.iq/books/about/Shigley_s_Mechanical_Engineering_Design.html?id=ikUR0AEACAAJ&source=kp_book_description&redir_esc=y	Recommended supporting books and references (scientific journals, reports....)



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: : Mechanical Engineering Techniques of Power
Scientific title: lecturer
Academic qualification: Master
Work location: Mechanical Engineering Techniques of Power

Course Description Form 2023/2024

74-	Course Name	
		Automotive Technology
75-	Course Code	
76-	Semester / Year	
		2023/ 2024
77-	Description Preparation Date:	
		1/ 7 / 2024
78-	Available Attendance Forms:	
		Lectures in the presence of students (Online if necessary)
79-	Number of study hours (total)/number of units (total)	
		180 hours-30 week / 6 unit
80-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
		Mohammed Ali Diwan

28. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on workshop	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic .	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration engineering, mechanical engineering, ,)	√

29. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

49. Objectives of the educational program: Given the rapid scientific and technological progress in the field of automotive technology, the Department of mechanical Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of automotive technology and keeping pace with rapid scientific development through direct contact with mechanical engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic mechanical and power plants , seminars, and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√

	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

50. Course structure

Week	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Direct assessment method	Indirect assessment method
1	6	Knowledge and understanding	Automotive technology Clutch , theory	The direct method is .through lectures	Written tests	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills		The subjective method is through preparing research papers and discussing them collectively	Oral exams	Interviews or questionnaires to survey employers' opinions
		thinking skills		Scientific seminars on the most important research carried out in the field of .specialization	Completion files and performance assistant	Interviews or questionnaires to survey student .opinions
		Generic and transferable skills (other skills related to employability and personal development)		An interactive method by dividing students into small groups	Projects and observation	external assessmeters
2	6	Knowledge and understanding	Vehicle technology Clutch separator in manual shift cars	The direct method is .through lectures	Written tests	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills		The subjective method is through preparing research papers and discussing them collectively	Oral exams	Interviews or questionnaires to survey employers' opinions
		thinking skills		Scientific seminars on the most important research carried out in the field of .specialization	Completion files and performance assistant	Interviews or questionnaires to survey student opinions.
		Generic and transferable		An interactive method by	Projects and	external assessmeters

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
3	6	Knowledge and understanding	√	Mechanisms of disassembly, installation and fault diagnosis	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
4	6	Knowledge and understanding	√	Mechanisms of disassembly, installation and fault diagnosis	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
5	6	Knowledge and understanding	√	Identify the manual gearbox and select different speeds	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
6	6	Knowledge and understanding	√	Identify the manual gearbox and select different speeds	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
7	6	Knowledge and understanding	√	Determine the speed control mechanisms for the gearbox	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
8	6	Knowledge and understanding	√	The basic parts of the gear box	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

9	6	Knowledge and understanding	√	Automatic gearbox .basic function	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	6	Knowledge and understanding	√	Basic installation of the automatic gearbox	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	6	Knowledge and	√		The direct method is	√	Written tests	√	Interviews or	

		understanding		The basic parts of the automatic gearbox	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
12	6	Knowledge and understanding	√	The basic parts of the automatic gearbox	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
13	6	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				Torque converter, conversion method and torque multiplier				survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
14	6	Knowledge and understanding	√	Basic parts of a torque converter	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
15	6	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√

								opinions		
		Subject-specific skills	√	Solar panels in the automatic gearbox	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
16	6	Knowledge and understanding	√	Hydraulic system, sensors, valves and working method	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
17	6	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√	identifying and maintaining system malfunctions	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
18	6	Knowledge and understanding	√	The drive shaft transmits movement from the gearbox to the axles	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
19	6	Knowledge and understanding	√	The drive shaft transmits movement from the gearbox to the axles	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
20	6	Knowledge and understanding	√	Identify faults and how to inspect and repair the transmission	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
21	6	Knowledge and understanding	√	the front axles of vehicles, functions and the method of transmitting motion to the wheels	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

					research papers and discussing them collectively			survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
22	6	Knowledge and understanding	√	The rear axles of vehicles, their functions and the method of transmitting motion to the wheels	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
23	6	Knowledge and understanding	√	Determine faults in the front and rear axles	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

					discussing them collectively				opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
24	6	Knowledge and understanding	√	Maintenance and repair of axles and transmissions	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
25	6	Knowledge and understanding	√	The basic types of transmission lines from the engine to the .wheels	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
26	6	Knowledge and understanding	√	Suspension system parts and functions	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
27	6	Knowledge and understanding	√	Steering system and its types	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
28	6	Knowledge and understanding	√	Braking system, stopping mechanism .and basic parts	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
29	6	Knowledge and understanding	√	Disassembly, installation and troubleshooting	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

51. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.						
First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	10	10	10	10	10	40

52. Learning and teaching resources	
1-Introduction To Automotive Technology . Editor: Janis Levsen 2. -Modern automotive technology . Fundamentals, service, diagnostics 2nd English edition The German edition	Required textbooks (methodology, if any)
1. Advanced Automotive Technology: Visions of a Super-Efficient Family Car . 2- Modren Automotive technology . James . dutye.	Main references (sources)
1. Motor vehicle fuel economy: the forgotten HC control strategy 2-Major automotive firms' engine technology development (1980–1990)	Recommended supporting books and references (scientific journals, reports....)
https://www.sciencedirect.com/science/article/abs/pii/S1361920996000016 https://books.google.iq/books?hl=en&lr=&id=m3Z0EAAAQBAJ&oi=fnd&pg=PT14&dq=automotive+engineering+fundamentals&ots=OxKm4jin-0&sig=6iYgWPa2X3ENPQIUeQmRTLQmLck&redir_esc=y https://dl.icdst.org/pdfs/files/1bd36ee204b8e573c1217237854b8945.pdf	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: **Mechanical Engineering Techniques of Power**
Scientific title: **Assistance Professor**
Academic qualification: **Doctorate**
Work location: **Mechanical Engineering Techniques of Power**

Course Description Form 2023/2024

81-	Course Name	
		Design of Automotive Parts
82-	Course Code	
83-	Semester / Year	
		٢٠٢٤/٢٠٢٣
84-	Description Preparation Date:	
		٢٠٢٤/٤/٧
85-	Available Attendance Forms:	
		Lectures in the presence of students (Online if necessary)
86-	Number of study hours (total)/number of units (total)	
		60 Hours-20 week / 6 unit
87-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
		Asst. Prof. Dr. Ahmed Salim Naser Almurshedi

30. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,	√

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31. Teaching and Learning Strategies	
Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

53. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students	√

		with the faculty	
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

54. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	Introduction Internal Combustion Engine Classifications	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	2	Knowledge and understanding	√	Design of Engine block	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
۳	۳	Knowledge and understanding	√	Design of Engine Lining / Types and Material	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۴	۳	Knowledge and understanding	√	Design of Clutch	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
٥	٢	Knowledge and understanding	√	Valves Types, Material and Design.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٦	٢	Knowledge and understanding	√	Piston of Engine< Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
γ	ϛ	Knowledge and understanding	√	Connected Rod, Material and Design.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
λ	ϛ	Knowledge and understanding	√	Propeller Shaft, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

9	۲	Knowledge and understanding	√	Journal Bearings, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۰	۳	Knowledge and understanding	√	Ball Bearing, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۱	۳	Knowledge and	√	External Brake	The direct method is	√	Written tests	√	Interviews or	

		understanding		Material and Design	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۲	۳	Knowledge and understanding	√	Internal Brake Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۳	۳	Knowledge and understanding	√	Gear Box,	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				Material and Design				survey graduates' opinions			
		Subject-specific skills	√			The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√			Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√			An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٤	٣	Knowledge and understanding	√	Planet Gears, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions		
		Subject-specific skills	√			The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√			Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√			An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٥	٣	Knowledge and understanding	√	Coupling Joint,	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√	

				Material and Design				opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
۱۶	۳	Knowledge and understanding	√	Flywheel, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۷	۳	Knowledge and understanding	√	Steering System, Dynamic	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√	vibration, types and Design	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٨	٣	Knowledge and understanding	√	Clutch Design, Multi-Surfaces	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٩	٣	Knowledge and understanding	√	Suspensions systems,types	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

				Material and Static and Dynamic Design	through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions		
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۰	۳	Knowledge and understanding	√	Examinations and levels	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۱	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to	

					research papers and discussing them collectively				survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۲	۲	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۳	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'	

					discussing them collectively				opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٤	٣	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٥	٣	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۶	۲	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۷	۲	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۸	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۹	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

55. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	10	10	10	10	10	40

56. Learning and teaching resources

Aircraft Systems and maintenance, lists of Airbus company	Required textbooks (methodology, if any)
Aircraft Systems and maintenance, lists of Airbus company	Main references (sources)
Aircraft Systems and maintenance, lists of Airbus company	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical Engineering Techniques of Power
Lecturer Name: Yasir Fayez Youssif
Scientific title: Assistant Lecturer
Academic qualification: Master
Work location: Mechanical Engineering Techniques of Power

Course Description Form 2023/2024

88-	Course Name	
		Diagnosis of malfunctions
89-	Course Code	
90-	Semester / Year	٢٠٢٤/٢٠٢٣
91-	Description Preparation Date:	٥/1/2024
92-	Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
93-	Number of study hours (total)/number of units (total)	60 hours within 30 weeks / 7 units
94-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
	Name: Eng. Yasser Fayez Yousef Email:coj.yaserfa@atu.edu.iq	

32.Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√

A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on various equipment	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults for automotive systems	√
D4	The ability to adapt to similar specializations (refrigeration and air conditioning engineering, renewable energies,)	√

33. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).

a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√

c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	√
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	√
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	√

57. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated subjects in the study of vehicle technology and keeping pace with the rapid scientific development through direct contact with decision-makers for vehicle engineering around the world and direct contact with colleges and institutes specialized in vehicle technology	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to factories, seminars, training and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging effective scientific participation and visits in conferences, technical meetings and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities	√

		Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Direct Evaluation Method	Indirect evaluation method
1-2	4	Knowledge understanding and ✓	Fundamentals of Computer Systems Cybernetics, computer features, digital electronics, integrated circuits, computer signals, computer system operation, sensors, computers, actuators.	The direct method through lectures. ✓	Written tests ✓	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills ✓		Self-method through the preparation of research papers and discussion collectively ✓	Oral exams ✓	Interviews or questionnaires to survey employers' opinions
		Thinking skills ✓		Scientific seminars on the most important research carried out in the field of specialization. ✓	Achievement files and performance evaluation ✓	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development) ✓		An interactive way by dividing students into small groups ✓	Projects & Observation ✓	External Evaluators
3-4	4	Knowledge understanding and ✓	On-board diagnostic and scanning tools Scan for computer problems, problem icons axis.	The direct method through lectures. ✓	Written tests ✓	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills ✓		Self-method through the preparation of research papers and discussion collectively ✓	Oral exams ✓	Interviews or questionnaires to survey employers' opinions
		Thinking skills ✓		Scientific seminars on the most important research carried out in the field of specialization. ✓	Achievement files and performance evaluation ✓	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development) ✓		An interactive way by dividing students into small groups ✓	Projects & Observation ✓	External Evaluators
5-6	4	Knowledge understanding and ✓	Computer System Initial visual inspection, computer system circuit problems, sensor and operator problems, sensor service, operator service,	The direct method through lectures. ✓	Written tests ✓	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills ✓		Self-method through the preparation of research papers and discussion ✓	Oral exams ✓	Interviews or questionnaires to survey

				computer service.	collectively			employers' opinions	
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
7	2	Knowledge and understanding	√	Engine performance and driving power Identify engine performance problems, typical performance problems.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
8-12	10	Knowledge and understanding	√	Advanced Diagnosis Vacuum and pressure measurement tests, vacuum pump tests, diesel engine test, advanced scanning tools, checking computer terminal values, electromagnetic interference isolation, using a digital pyrometer, finding performance problems related to temperature, using a force meter, using oscilloscope, using an oscilloscope, engine analyzer.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
13-14	4	Knowledge and understanding	√	Engine tuning	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey

				General Tuning Rules, Tuning Safety Rules, Standard Tuning Procedures, Diesel Engine Tuning (Maintenance), Engine Adjustment Intervals (Maintenance)					graduates' opinions		
		Subject-specific skills	√			Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Thinking skills	√			Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.	
		General and transferable skills (other skills related to employability and personal development)	√			An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators	
15-16	4	Knowledge and understanding	√	Engine mechanical problems Why is diagnosis important? Symptoms of mechanical problems of the engine, determination of the type of engine repair required, evaluation of mechanical problems of the engine, manual troubleshooting schemes for the service.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions		
		Subject-specific skills	√			Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Thinking skills	√			Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.	
		General and transferable skills (other skills related to employability and personal development)	√			An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators	
17-19	6	Knowledge and understanding	√	Removing the engine, disassembling it and cleaning parts Engine removal, engine disassembly, engine parts cleaning	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions		
		Subject-specific skills	√			Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		Thinking skills	√			Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.	
		General and transferable skills (other skills related to employability and personal development)	√			An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators	

		development)							
20-23	8	Knowledge understanding and	√	Engine Bottom End Service Cylinder block service, stabilizer shaft service, piston servicing, piston piston servicing, connecting rod service, piston ring service, crankshaft service, piston and rod assembly assembly, torque-to-yield bolts, engine balancing, engine final assembly.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
24-27	8	Knowledge understanding and	√	Top End Engine Service Cylinder Head Service, Diesel Combustion Chamber Service, Valve Guide Service, Valve Seat Refurbishment, Test Valve Assembly, Camshaft Service, Crane Service, Thrust Bar Service, Boom Assembly Service, Overhead Engine Reassembly, Valve Adjustment Valve Cover Installation.	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.
		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators
28-30	6	Knowledge understanding and	√	Front Engine Service & Engine Installation Timing Series, Gear Service, Front Crankshaft Seal Service, Front Cover Service, Timing Belt Service, Full Engine Assembly, Engine Stabilization, Engine Breakage	The direct method through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		Self-method through the preparation of research papers and discussion collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		Thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Achievement files and performance evaluation	√	Interviews or questionnaires to survey student opinions.

		General and transferable skills (other skills related to employability and personal development)	√		An interactive way by dividing students into small groups	√	Projects & Observation	√	External Evaluators	
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59. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	۱۰	۱۰	۱۰	۱۰	۱۰	40

60. Learning and teaching resources

	Required textbooks (methodology, if any)
Halderman Advanced Engine Performance Diagnosis sixth edition	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department

University: Al-Furat Al-Awsat Technical University

College: Engineering Technical College/ NAJAF

Department : Technical force mechanics engineering

Name of the lecturer: Hasan Hadi Salman

Scientific title: Assist Professor

Academic qualification: Ph.D

Work location: Technical mechanical engineering

Course Description Form 2023/2024

1- Course Name	Industrial management
2- Course Code	ARE
3- Semester / Year	2023/2024
4- Description Preparation Date:	5/7/2024
5- Available Attendance Forms:	Lectures in the presence of students
6- Number of study hours (total)/number of units (total)	

60 hours-30 week / 4 unit

7- Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)

Assist Prof.Dr. Hasan Hadi Salman

8. Expected learning outcomes of the program

Knowledge and understanding

A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√

Subject-specific skills

B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√

thinking skills

C1	The ability to communicate effectively with those concerned with the field of	√
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	specialization on both the civil and military sides	
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on mechanical engineering especially automotive	
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	
D3	The ability to work with the latest devices for diagnosing mechanical faults in design.	
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,)	√

9. Teaching and Learning Strategies	
Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√

c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	✓
e- Works effectively as a member or leader in a specialized engineering team.	✓
f- Identifies, analyzes and solves large-scale engineering problems.	✓
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	✓
h- Participates in self-directed continuing professional development.	✓
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	✓
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	✓
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

11. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of mechanical technology and keeping pace with rapid scientific development through direct contact with mechanical engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	✓
	A2	Continuous evaluation and development of curricula.	✓
	A3	Linking student projects and research to community needs.	✓
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	✓
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	
C- Providing the best university environment	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a	✓

for faculty and students		library.	
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	✓
	D2	Continuous review and evaluation of student and faculty activities	✓
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	✓
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	✓
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	✓
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	✓
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	✓
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	✓
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	✓

12. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	Concepts and objectives of industrial engineering	The direct method is through lectures.	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.		Completion files and performance assistant		Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	2	Knowledge and understanding	√	Plant Location	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.		Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
3	2	Knowledge and understanding	√	Administrative organization of an industrial facility	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
4	2	Knowledge and understanding	√		The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to	

		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
5	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
6	2	Knowledge and understanding	√

Technological organization of an industrial facility

Work study

research papers and discussing them collectively				survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates'

		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
7	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and	√

Applications about work study

Technical and economic studies for project feasibility

				opinions
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters

		personal development)	
8	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
9	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√

Applications on technical and economic studies for project feasibility

Applications on

The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student	

				technical and economic studies for project feasibility	specialization.				opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters	
10	2	Knowledge and understanding	√	Production costs	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	2	Knowledge and understanding	√		The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√	Break-even analysis (profit planning)	Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
12	2	Knowledge and understanding	√	The relationship between cost, profit and production quantity	The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
13	2	Knowledge and understanding	√		The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions

		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
14	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√

Productivity

Measuring productivity

The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	

15	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
16	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√

Your post-graduation project

The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters	√
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√	replacement and Maintenance models
17	2	Knowledge and understanding	√	replacement models
		Subject-specific skills	√	
		thinking skills	√	
		Generic and transferable skills (other skills related to employability and personal development)	√	
18	2	Knowledge and understanding	√	
		Subject-specific skills	√	

An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
19	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
20	2	Knowledge and understanding	√
		Subject-specific skills	√

Maintenance models

Materials management

Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to	

		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
		Quality control	
		Control Chart for Attributes	
		Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
21	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
22	2	Knowledge and understanding	√

research papers and discussing them collectively				survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates'	

		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
23	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and	√

Linear programming

Types of linear programming formulas

				opinions
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)	
24	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
25	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√

Form formulation

Graphical method

The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student	

		Generic and transferable skills (other skills related to employability and personal development)	√
26	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
27	2	Knowledge and understanding	√
		Subject-specific skills	√

Applications on Graphical method

Simplex method

specialization.				opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers'	

		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
28	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
29	2	Knowledge and understanding	√

Applications on Simplex method

collectively				opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√
30	2	Knowledge and understanding	√
		Subject-specific skills	√
		thinking skills	√
		Generic and transferable skills (other skills related to employability and personal development)	√

M – technique method

Applications on M – technique method

The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
The direct method is through lectures.	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
Scientific seminars on the most important research carried out in the field of specialization.	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

13. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
20		20		10		50

14. Learning and teaching resources

Industrial engineering and management , C. Nadha Muni Reddy	Required textbooks (methodology, if any)
الهندسة الصناعية د. عادل عبد الملك كوريال، -الإدارة الصناعية -ايسر سوسان ، فراس عبار شقي	Main references (sources)
INDUSTRIAL MANAGEMENT: WHAT YOU NEED TO KNOW BEFORE STARTING A CAREER. IMIM	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical Engineering
Scientific title: Assistant Lecturer
Academic qualification: Master
Work location: Automobile engineering

Course Description Form 2023/2024

95-	Course Name	
		Advanced Automotive Technology
96-	Course Code	
		ARE 449
97-	Semester / Year	
		٢٠٢٤/٢٠٢٣
98-	Description Preparation Date:	
		٢٠٢٤/٤/٧
99-	Available Attendance Forms:	
		Lectures in the presence of students (Online if necessary)
100-	Number of study hours (total)/number of units (total)	
		60 hours-30 week / ٤ unit
101-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
		A.L. Ahmed Dheyaa Jawad

34. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work in specialized workshop in and out country	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in automobile systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,	√

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35. Teaching and Learning Strategies	
Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

61. Objectives of the educational program: Given the rapid scientific and technological progress in the field of automobile technology, the Department of Automotive Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of automobile technology and keeping pace with rapid scientific development through direct contact with automobile engineering decision-makers all over the world and direct contact with colleges and institutes specialized in automobile technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to technical workshop, seminars, and training on specific workshops and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international factories administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic,	√

		artistic and religious fields with the teaching staff	
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

62. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	Historical development of automobiles	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	2	Knowledge and understanding	√	Light weight construction	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
۳	۲	Knowledge and understanding	√	Modern automotive materials	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۴	۲	Knowledge and understanding	√	Gasoline Direct Injection system (GDI) engines part 1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
o	۲	Knowledge and understanding	√	Gasoline Direct Injection system (GDI) engines part 2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٦	۲	Knowledge and understanding	√	Variable Compression Ratio (VCR) engines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
γ	γ	Knowledge and understanding	√	Turbocharging System	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
λ	γ	Knowledge and understanding	√	Electric Vehicles	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

٩	٢	Knowledge and understanding	√	Hybrid Vehicles part 1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٠	٢	Knowledge and understanding	√	Hybrid Vehicles part 2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١١	٢	Knowledge and	√	Continuously Variable	The direct method is	√	Written tests	√	Interviews or	

		understanding		Transmission (CVT)	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۲	۲	Knowledge and understanding	√	Automated Manual Transmission (AMT)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۳	۲	Knowledge and understanding	√	Advanced automotive Suspension	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				- Active suspension system				survey graduates' opinions			
		Subject-specific skills	√			The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√			Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√			An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٤	٢	Knowledge and understanding	√	Advanced Automotive Steering	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions		
		Subject-specific skills	√			The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√			Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√			An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٥	٢	Knowledge and understanding	√	Advanced automotive Braking - Anti-Lock Brake	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√	

				system (ABS)				opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
		Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
۱۶	۲	Subject-specific skills	√	Traction Control System (TCS)	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۷	۲	Knowledge and understanding	√	Occupants safety systems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۸	۲	Knowledge and understanding	√	Security Systems 1	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۹	۲	Knowledge and understanding	√	Security Systems 2	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۰	۲	Knowledge and understanding	√	Advanced Driver Assistance Systems (ADAS) - Lane Keeping System - Lane Departure Warning System	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۱	۲	Knowledge and understanding	√	Advanced Driver Assistance Systems (ADAS)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	- Navigation System	The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

					research papers and discussing them collectively			survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۲	۲	Knowledge and understanding	√	Advanced Driver Assistance Systems (ADAS) - Blind Spot System	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۳	۲	Knowledge and understanding	√	Advanced Driver Assistance Systems (ADAS) - Night Vision System	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

					discussing them collectively			opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢٤	٢	Knowledge and understanding	√	Advanced Driver Assistance Systems (ADAS) - Adaptive Cruise Control System	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢٥	٢	Knowledge and understanding	√	Advanced Driver Assistance Systems (ADAS) - Key-less Entry	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۶	۲	Knowledge and understanding	√	(ADAS) - multiple data sources - automotive imaging - LiDAR and radar	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۷	۲	Knowledge and understanding	√	(ADAS) - image processing - computer vision - in-car networking - Vehicle to Vehicle communication	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٨	٢	Knowledge and understanding	√	Auto Parking System smart-parking-system	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٩	٢	Knowledge and understanding	√	Autonomous driving (self-driving cars)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

63. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	۱۰	۱۰	۱۰	۱۰	۱۰	40

64. Learning and teaching resources

Automobile Systems and maintenance, lists of Airbus company	Required textbooks (methodology, if any)
Automobile Systems and maintenance, lists of Airbus company	Main references (sources)
Automobile Systems and maintenance, lists of Airbus company	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Mechanical Engineering Techniques of Power
Scientific title: **Assistant Lecture**
Academic qualification: Master
Work location: Mechanical Engineering Techniques of Power

Course Description Form 2023/2024

102-	Course Name	Vehicle Dynamics
103-	Course Code	
104-	Semester / Year	٢٠٢٤/٢٠٢٣
105-	Description Preparation Date:	٢٠٢٤/٤/٧
106-	Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
107-	Number of study hours (total)/number of units (total)	٦٠ hours-30 week / ٤ unit
108-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Assistant lecture .Zainab Mohammed Mahdi

36. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on support equipment for various types of vehicles and trucks	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in vehicles systems.	√
D4	The ability to adapt to similar specializations (refrigeration and air conditioning engineering, mechanical engineering, renewable energies,)	√

37. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

65. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of vehicle technology and keeping pace with rapid scientific development through direct contact with vehicle engineering decision-makers all over the world and direct contact with colleges and institutes specialized in vehicle technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expand students' concepts with field visits to companies, internal factories, seminars and training in maintenance workshops	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with company departments, Iraqi and international vehicle maintenance workshops, and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students	√

		with the faculty	
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

66. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	- Identify vehicle parts -Introduction - Basic definitions	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2-3	2	Knowledge and understanding	√	Basic components of internal combustion engines	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
4	2	Knowledge and understanding	√	Power systems in internal combustion engines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
5	2	Knowledge and understanding	√	Combustion forces	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
6	2	Knowledge and understanding	√	Mechanical impact forces	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
7	2	Knowledge and understanding	√	Inertia forces and moments	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
8	2	Knowledge and understanding	√	Single cylinder machines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
9	2	Knowledge and understanding	√	Multi-cylinder machines - arranged on one line	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

10	2	Knowledge and understanding	√	V-shaped machines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	2	Knowledge and understanding	√	Rotary machines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
12-15	2	Knowledge and	√	Machines with	The direct method is	√	Written tests	√	Interviews or	

		understanding		special specifications	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
16	۳	Knowledge and understanding	√	Car body vibrations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
17-18	۳	Knowledge and understanding	√	Single	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				temperature systems				survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
19	۳	Knowledge and understanding	√	Natural frequency of simple machines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
20-21	۳	Knowledge and understanding	√	Free vibration of dual motors	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√

								opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
22-23	2	Knowledge and understanding	√	Forced vibration of machines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
24	۲	Knowledge and understanding	√	Rotary balance in machines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
25	2	Knowledge and understanding	√	Curved hover of bars	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
26	2	Knowledge and understanding	√	Torsional stiffness and moments	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
27	2	Knowledge and understanding	√	Inertia forces of systems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
28-30	2	Knowledge and understanding	√	Equivalent to machines	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

					research papers and discussing them collectively				survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	

67. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
20	0	20	0	10	0	50

68. Learning and teaching resources

M.Khuvakh, Motor Vehicle Engine, MIR Publications	Required textbooks (methodology, if any)
Hamilton H. Mobie, Mechanisms and Dynamics Machinery, John Willey & Sons	Main references (sources)
P. W. Kett, Motor Vehicle Science, part2, Chapman& Hall	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Department of power mechanics engineering
techniques
Scientific title: Assistant Lecturer
Academic qualification: Master
Work location: Department of power mechanics engineering
techniques

Course Description Form 2023/2024

109-	Course Name	English Language
110-	Course Code	ARE 449
111-	Semester / Year	٢٠٢٤/٢٠٢٣
112-	Description Preparation Date:	٢٠٢٤/٤/٧
113-	Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
114-	Number of study hours (total)/number of units (total)	30 hours-30 week / 2 unit
115-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Asst.Lect. Mohammed Salim Abdulameer

38. Expected learning outcomes of the program

Knowledge and understanding		
A1	1. Develop their intellectual, personal and professional abilities.	√
A2	2. Develop their intellectual, personal and professional abilities.	√
A3	3. Acquire basic language skills (listening, speaking, reading and writing) in order to communication with speakers of English language.	√
A4	4. Develop positive attitudes towards learning English.	√
Subject-specific skills		
B1	Ability to work and integrate into Phonotic and reading	√
B2	Ability to write a sentences	√
B3	The ability to use modern techniques, in learning English	√
B4	Ability to understanding any shape and form in teaching English Language	√
thinking skills		
C1	1. Putting Language into practice through speaking.	√
C2	2. Being able to read Advertisements or English writing through developing reading skill.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work the form of Teaching English.	√
D2	Skill in rading and writing of English Languge.	√
D3	The ability to work with new generation for listen.	√

39. Teaching and Learning Strategies

Strategies	<p>1- Uses the available material to increase his efficiency.</p> <p>2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task.</p> <p>3- Defines basic Modals and employ them in elementary level of communication and writing skills.</p> <p>4- Develop and enhance students' language skills to communicate in English properly.</p> <p>5- Interprets the texts written in elementary level of English.</p>
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10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
1- Uses expressions of Quantity in elementary level of English.	√
2- Constructs sentences in Present Perfect Tense, Simple Future Tense and Going to Future Tense both in an oral and written task.	√
3- Defines basic Modals and employ them in elementary level of communication and writing skills.	
4- Translates sentences in elementary level from English to another language.	
5- Interprets the texts written in elementary level of English.	√

69. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A-	Maintaining	and	A1
1-The aim of this course is to provide English learners with integrated			√

improving the quality of the curriculum		language skills such as reading, listening and writing resulting in a level of basic language knowledge.	
	A2	2-This course will focus on grammar rules, basic word knowledge and usage, reading comprehension, reading out of the lesson, and Paragraph writing.	√
	A3	3- A student may be able to listen to native speakers and speak English Language.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all English language specializations (technology incubator)	√

70. Course structure

Week	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Direct assessment method	Indirect assessment method
1	1	Cognitive output	Introduction in English Language	Lecture	Homework & Quizzes	Interviews or questionnaires to survey graduates' opinions
		Cognitive output		Discussion	Homework & Quizzes	Interviews or questionnaires to survey employers' opinions
		Cognitive output		Lecture	Homework & Quizzes	Interviews or questionnaires to survey student opinions
		Knowledge and skills		Discussion	Homework & Quizzes	external assessmeters
2	1	Cognitive output	Practicing and working for exceptional for English reading	Lecture	Homework & Quizzes	Interviews or questionnaires to survey graduates' opinions
		Knowledge and skills		Discussion	Homework & Quizzes	Interviews or questionnaires to survey employers' opinions
		Cognitive output		Lecture	Homework & Quizzes	Interviews or questionnaires to survey student opinions.
				Discussion	Homework & Quizzes	external assessmeters

3	)	Cognitive output	√	The past perfect tense.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
4	)	Cognitive output	√	The present simple tense + Synonyms	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	

5	1	Cognitive output	√	The future simple tense.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
6	1	Cognitive output	√	The present perfect tense..	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	

7-10	)	Cognitive output	√	Paraphrasing English Language + Presentation.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
11	)	Cognitive output	√	English key words in Mechanical Engineering Techniques of Power Department.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
12-14	)	Cognitive output	√	Quotations English Language.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	

15	✓	Cognitive output	✓	Exam	Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey graduates' opinions	
16-18	✓	Cognitive output	✓	Unity and Coherence in English Language.	Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	✓		Discussion	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	✓		Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	✓		Discussion	✓	Homework & Quizzes		external assessmeters	
19-21	✓	Cognitive output	✓	Personfication and Repetition in English Language	Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	✓		Discussion	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	✓		Lecture	✓	Homework & Quizzes	✓	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	✓		Discussion	✓	Homework & Quizzes		external assessmeters	

22	1	Cognitive output	√	Opposites + Presentation	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	√
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	√
23-25	1	Cognitive output	√	Steps of writing in English Language.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
		Cognitive output	√		Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey student opinions.	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes		external assessmeters	
26	1	Cognitive output	√	Polite request English Language.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework & Quizzes	√	Interviews or questionnaires to survey employers' opinions	
27-29	1	Cognitive output	√	Steps of Success in accademic writing.	Lecture	√	Homework & Quizzes	√	Interviews or questionnaires to survey graduates' opinions	
		Knowledge and skills	√		Discussion	√	Homework &	√	Interviews or	

						Quizzes	questionnaires to survey employers' opinions	
30		Cognitive output	√	Review		Homework & Quizzes		

First semester/theoretical	Second/theoretical semester	Work of the year/activities and absences	Final/theoretical exam
20	20	10	50

71. Learning and teaching resources	
<p><i>Upper-Intermediate New Headway</i></p> <p>By: John Soars & Liz Soars</p>	Required textbooks (methodology, if any)
- Alexander, L G. Developing Skills: Student's Book (New Concept English)	Main references (sources)
- Raymond, Murphy. English Grammar in Use (2nd ed.). Cambridge University Press.	Recommended supporting books and references (scientific journals, reports....)
<p>Google Books</p> <p>Google Scholar</p> <p>engvid.com</p>	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: **Mechanical Engineering Techniques of Power**
Scientific title: **Assistance Professor**
Academic qualification: Doctorate
Work location: **Mechanical Engineering Techniques of Power**

Course Description Form 2023/2024

116-	Course Name	
		Design of Automotive Parts
117-	Course Code	
118-	Semester / Year	
		٢٠٢٤/٢٠٢٣
119-	Description Preparation Date:	
		٢٠٢٤/٤/٧
120-	Available Attendance Forms:	
		Lectures in the presence of students (Online if necessary)
121-	Number of study hours (total)/number of units (total)	
		60 Hours-20 week / 6 unit
122-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	
		Asst. Prof. Dr. Ahmed Salim Naser Almurshedi

40. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,	√

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41. Teaching and Learning Strategies	
Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

72. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students	√

		with the faculty	
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

73. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	Introduction Internal Combustion Engine Classifications	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	2	Knowledge and understanding	√	Design of Engine block	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
۳	۳	Knowledge and understanding	√	Design of Engine Lining / Types and Material	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۴	۳	Knowledge and understanding	√	Design of Clutch	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
o	۲	Knowledge and understanding	√	Valves Types, Material and Design.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۶	۲	Knowledge and understanding	√	Piston of Engine< Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

		personal development)							
γ	ϛ	Knowledge and understanding	√	Connected Rod, Material and Design.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
λ	ϛ	Knowledge and understanding	√	Propeller Shaft, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

9	۲	Knowledge and understanding	√	Journal Bearings, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۰	۳	Knowledge and understanding	√	Ball Bearing, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۱	۳	Knowledge and	√	External Brake	The direct method is	√	Written tests	√	Interviews or	

		understanding		Material and Design	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۲	۳	Knowledge and understanding	√	Internal Brake Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۳	۳	Knowledge and understanding	√	Gear Box,	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				Material and Design				survey graduates' opinions			
		Subject-specific skills	√			The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√			Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√			An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٤	٣	Knowledge and understanding	√	Planet Gears, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions		
		Subject-specific skills	√			The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√			Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√			An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٥	٣	Knowledge and understanding	√	Coupling Joint,	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates'	√	

				Material and Design				opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
۱۶	۳	Knowledge and understanding	√	Flywheel, Material and Design	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۷	۳	Knowledge and understanding	√	Steering System, Dynamic	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√	vibration, types and Design	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۸	۳	Knowledge and understanding	√	Clutch Design, Multi-Surfaces	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۹	۳	Knowledge and understanding	√	Suspensions systems,types	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

				Material and Static and Dynamic Design	through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions		
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۰	۳	Knowledge and understanding	√	Examinations and levels	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۱	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to	

					research papers and discussing them collectively			survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۲	۲	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۳	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

					discussing them collectively				opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٤	٣	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٥	٣	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۶	۲	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۷	۲	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۸	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۹	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

74. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	10	10	10	10	10	40

75. Learning and teaching resources

Aircraft Systems and maintenance, lists of Airbus company	Required textbooks (methodology, if any)
Aircraft Systems and maintenance, lists of Airbus company	Main references (sources)
Aircraft Systems and maintenance, lists of Airbus company	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



**Ministry of Higher Education and Scientific
Research
Scientific Supervision and Scientific Evaluation
Apparatus
Directorate of Quality Assurance and Academic
Accreditation
Accreditation Department**



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: **Mechanical Engineering Techniques of Power**
Scientific title: **Assistance Professor**
Academic qualification: **Doctorate**
Work location: **Mechanical Engineering Techniques of Powe**

Course Description Form 2023/2024

123-	Course Name	Vehicles Theory
124-	Course Code	
125-	Semester / Year	٢٠٢٤/٢٠٢٣
126-	Description Preparation Date:	٢٠٢٤/٤/٧
127-	Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
128-	Number of study hours (total)/number of units (total)	90 hours-30 week / 6 unit
129-	Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Prof. Dr. Ali Shakir Baqir

42. Expected learning outcomes of the program		
Knowledge and understanding		
A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√
Subject-specific skills		
B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√
thinking skills		
C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√
Generic and transferable skills (other skills related to employability and personal development)		
D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,	√

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43. Teaching and Learning Strategies	
Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

76. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students	√

		with the faculty	
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

77. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	2	Knowledge and understanding	√	Introduction to rubber tire load. The forces acting on the vehicle when driving in a straight line / external resistances / traction effort / excess effort. Evaluation of pushing or towing the vehicle. Performance characteristics of a vehicle equipped with conventional transmission devices/vehicle speed and traction effort curves	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	2	Knowledge and understanding	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves Vehicle acceleration during acceleration and load shifting. Vehicle braking/braking response/deceleration during braking time,	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)		load shift during braking, braking performance. Vehicle behavior in .side winds	dividing students into small groups		observation		
۳	۳	Knowledge and understanding	√	Behavior of vehicles in corners, rollover and sliding of the vehicle on a horizontal curved path and a curved path with a slope. Critical speeds. Dynamic relationships. .Vehicle vibrations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۴	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters

		skills (other skills related to employability and personal development)			dividing students into small groups		observation		
o	۳	Knowledge and understanding	√	Braking system, types of basic calculations for designing drum and disc brakes Introduction to rubber tire load. The forces acting on the vehicle when driving in a straight line / external resistances / traction effort / excess effort. Evaluation of pushing .or towing the vehicle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۶	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters

		to employability and personal development)			small groups				
γ	τ	Knowledge and understanding	√	Performance characteristics of a vehicle equipped with conventional transmission devices/vehicle speed and traction effort curves Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves Vehicle acceleration during acceleration and load shifting. Vehicle braking/braking response/deceleration during braking time, load shift during braking, braking performance	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
λ	τ	Knowledge and understanding	√	Vehicle behavior in side winds. Behavior of vehicles in corners, rollover and sliding of the vehicle on a horizontal curved	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

				path and a curved path with a slope. Critical speeds. Dynamic .relationships	research papers and discussing them collectively			survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٩	٢	Knowledge and understanding	√	Vehicle vibrations. Introduction to rubber tire load. The forces acting on the vehicle when driving in a straight line / external resistances / traction .effort / excess effort	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
١٠	٣	Knowledge and understanding	√	Evaluation of pushing or towing the vehicle. Performance characteristics of a vehicle equipped with conventional transmission	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

				devices/vehicle speed and traction effort curves	discussing them collectively			opinions	
		thinking skills	√	Performance characteristics of vehicles equipped with self-propelled transmission	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	devices/vehicle speed and traction effort curves Vehicle acceleration during acceleration .and load shifting	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۱۱	۲	Knowledge and understanding	√	Vehicle braking/braking response/deceleration during braking time, load shift during braking, braking performance.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	Vehicle behavior in side winds.	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	Behavior of vehicles in corners, rollover and sliding of the vehicle on a horizontal curved path and a curved path with a slope.	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	.Critical speeds	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۱۲	۳	Knowledge and understanding	√	Dynamic relationships. Vehicle vibrations. Introduction to rubber .tire load	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
١٣	٣	Knowledge and understanding	√	The forces acting on the vehicle when driving in a straight line / external resistances / traction effort / excess effort.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	Evaluation of pushing or towing the vehicle. Performance characteristics of a vehicle equipped with conventional transmission devices/vehicle speed and traction effort curves	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
١٤	٣	Knowledge and	√	Vehicle acceleration	The direct method is	√	Written tests	√	Interviews or

		understanding		during acceleration and load shifting. Vehicle	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√	braking/braking response/deceleration during braking time, load shift during braking, braking performance.	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√	Vehicle behavior in side winds. Behavior of vehicles in corners, rollover and sliding of the vehicle	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√	on a horizontal curved path and a curved .path with a slope	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
١٥	٣	Knowledge and understanding	√	Critical speeds. Dynamic relationships. .Vehicle vibrations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
١٦	٣	Knowledge and understanding	√	Introduction to rubber tire load.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				The forces acting on the vehicle when driving in a straight line / external resistances / traction effort / excess effort. Evaluation of pushing or towing the vehicle.				survey graduates' opinions	
		Subject-specific skills	√	Performance characteristics of a vehicle equipped with conventional transmission devices/vehicle speed and traction effort curves	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	Performance characteristics of a vehicle equipped with conventional transmission devices/vehicle speed and traction effort curves	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
١٧	٣	Knowledge and understanding	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	Vehicle acceleration during acceleration and load shifting.	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	Vehicle braking/braking response/deceleration during braking time, load shift during braking, braking performance.	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	Vehicle behavior in .side winds	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
١٨	٣	Knowledge and	√	Behavior of vehicles in	The direct method is	√	Written tests	√	Interviews or

		understanding		corners, rollover and sliding of the vehicle on a horizontal curved path and a curved path with a slope. Critical speeds. Dynamic relationships. .Vehicle vibrations	.through lectures				questionnaires to survey graduates' opinions		
		Subject-specific skills	√			The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√			Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√			An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۹	۳	Knowledge and understanding	√	Braking system, types of basic calculations for designing drum and disc brakes Introduction to rubber tire load. The forces acting on the vehicle when driving in a straight line / external resistances / traction effort / excess effort. Evaluation of pushing .or towing the vehicle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions		
		Subject-specific skills	√			The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√			Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√			An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۰	۳	Knowledge and understanding	√	Performance characteristics of a	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to		

				vehicle equipped with conventional transmission devices/vehicle speed and traction effort curves				survey graduates' opinions	
		Subject-specific skills	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	Vehicle acceleration during acceleration and load shifting. Vehicle braking/braking response/deceleration during braking time, load shift during braking, braking .performance	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۱	۳	Knowledge and understanding	√	Performance characteristics of a vehicle equipped with conventional transmission devices/vehicle speed and traction effort curves	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.

		Generic and transferable skills (other skills related to employability and personal development)	√	and traction effort curves Vehicle acceleration during acceleration and load shifting. Vehicle braking/braking response/deceleration during braking time, load shift during braking, braking .performance	An interactive method by dividing students into small groups	√	Projects and observation	external assessmeters	
۲۲	۳	Knowledge and understanding	√	Vehicle vibrations. Introduction to rubber tire load. The forces acting on the vehicle when driving in a straight line / external resistances / traction .effort / excess effort	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۳	۳	Knowledge and understanding	√	Evaluation of pushing or towing the vehicle. Performance characteristics of a vehicle equipped with conventional transmission	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

				devices/vehicle speed and traction effort curves	discussing them collectively			opinions	
		thinking skills	√	Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	Vehicle acceleration during acceleration .and load shifting	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢٤	٣	Knowledge and understanding	√	Vehicle braking/braking response/deceleration during braking time, load shift during braking, braking performance.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	Vehicle behavior in side winds.	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	Behavior of vehicles in corners, rollover and sliding of the vehicle on a horizontal curved path and a curved path with a slope.	Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	.Critical speeds	An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
٢٥	٣	Knowledge and understanding	√	Dynamic relationships. Vehicle vibrations. Introduction to rubber .tire load	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۶	۳	Knowledge and understanding	√	The forces acting on the vehicle when driving in a straight line / external resistances / traction effort / excess effort. Evaluation of pushing or towing the vehicle. Performance characteristics of a vehicle equipped with conventional transmission devices/vehicle speed and traction effort curves Performance characteristics of vehicles equipped with self-propelled transmission devices/vehicle speed and traction effort curves	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۷	۳	Knowledge and	√	Vehicle acceleration	The direct method is	√	Written tests	√	Interviews or

		understanding		during acceleration and load shifting. Vehicle	.through lectures			questionnaires to survey graduates' opinions	
		Subject-specific skills	√	braking/braking response/deceleration during braking time, ...load shifting during	The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
		Knowledge and understanding	√		Examinations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√	The subjective method is through preparing research papers and discussing them collectively		√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√	Scientific seminars on the most important research carried out in the field of .specialization		√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√	An interactive method by dividing students into small groups		√	Projects and observation		external assessmeters
۲۸	۳	Knowledge and understanding	√	Examinations	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۹	۳	Knowledge and understanding	√		The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to

78. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
10	10	10	10	10	10	40

79. Learning and teaching resources

Aircraft Systems and maintenance, lists of Airbus company	Required textbooks (methodology, if any)
Aircraft Systems and maintenance, lists of Airbus company	Main references (sources)
Aircraft Systems and maintenance, lists of Airbus company	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites