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

Academic program and course

2022-2023

وزارة التعليم العالي و البحث العلمي

جهاز الاشراف و التقويم العملي

دائره ضمان الجودة و الاعتماد الاكاديمي

استمارة وصف البرنامج الاكاديمي للكليات و المعاهد

الجامعة: جامعة الفرات الاوسط التقنية

الكلية: التقنية الهندسية/ نجف

القسم العلمي: هندسة تقنيات الاتصالات

تاريخ مليء الملف:

التوقيع:

اسم رئيس القسم : ا د احمد طه عبد السادة

التاريخ 2024\1\2

التوقيع :

اسم المعاون العلمي: م.د. باسل نوري مرزه

التاريخ :

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: م.د. باسل عبد الصاحب

التاريخ

التوقيع

مصادقة السيد العميد

2024/1/02

the introduction:

The educational program is considered a coordinated and organized package of academic courses that includes procedures and experiences organized in the form of academic vocabulary, the main purpose of which is to build and refine the skills of graduates, making them qualified to meet the requirements of the labor market. It is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.

The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that students are working to acquire based on the objectives of the academic program. The importance of this description is evident because it represents the cornerstone of obtaining program accreditation, and the teaching staff participates in writing it under the supervision of the scientific committees in the scientific departments.

This guide, in its second edition, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the latest developments in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, quarterly), in addition to adopting the description of the academic program circulated according to the book of the Department of Studies, T.M.3/2906 on 5/3/2023 regarding programs that adopt the Bologna Process as a basis for their work.

In this area, we can only emphasize the importance of writing descriptions of academic programs and courses to ensure the smooth conduct of the educational process.

Concepts and terminology:

Description of the academic program: The academic program description provides a brief summary of its vision, mission, and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course description: It provides a necessary summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the available learning opportunities. It is derived from the program description.

Program vision: An ambitious picture for the future of the academic program to be an advanced, inspiring, motivating, realistic and applicable program.

Program message: It briefly explains the objectives and activities necessary to achieve them, and also identifies the program's development paths and directions.

Program Goals: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

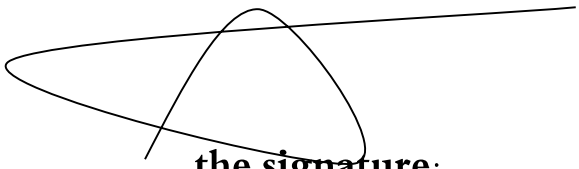
Curriculum structure: All courses/study subjects included in the academic program according to the approved learning system (semester, annual, Bologna track), whether it is a requirement (ministry, university, college, or scientific department), along with the number of study units.

Learning Outcomes: A compatible set of knowledge, skills, and values that the student has acquired after successfully completing the academic program. The learning outcomes for each course must be determined in a way that achieves the program objectives.

Teaching and learning strategies: They are the strategies used by the faculty member to develop the student's teaching and learning, and they are plans that are followed to reach the learning goals. That is, it describes all curricular and extracurricular activities to achieve the learning outcomes of the programme.

Academic program description form

University Name:Al–Furat Al–Awsat Technical University
the college/Institute:College of Engineering Technology/Najaf
scientific department:Communications Technology Engineering Department
Name of the academic or professional program:Bachelor of Communications Technology Engineering
Name of the final certificate:Bachelor's degree in Communications Technology Engineering
School system:annual
Date the description was prepared:9/1/2022
File filling date:9/1/2022



the signature:
Name of department head:Ahmed Taha Abdel Sada
the date:1\3\2023

the signature:
Name of scientific assistant:Dr. Basil Marza
the date:

Check the file before
Division of Quality Assurance and University Performance
Name of the director of the Quality Assurance and University Performance Division:
the date

the signature

Authentication of the Dean

a

1. **See the program**
Creating an academic university environment to create conditions and laboratories with international specifications to prepare, train and graduate students who possess the academic skills to supply the labor market with communications engineering technology skills..

2. **Program message**
Working to achieve the department's goals and aspirations by creating an appropriate educational environment and providing all the material and human requirements necessary to achieve this. And work to graduate groups capable of serving society in providing scientific, engineering and technical competence through technical education in accordance with internationally approved quality standards.

3. **Program Goals**
- Technical knowledge: Providing basic knowledge in the principles of electrical engineering in general and communications engineering in particular, along with the knowledge necessary to support mathematics, computers, and engineering basics.

2- Technical skills: Developing the basic skills necessary to implement and design laboratory and field projects. Also developing the ability to formulate projects and problems and develop a practical plan to benefit from technical knowledge and diverse skills.
3- Communication skills: Developing the ability to organize and present information effectively, whether orally, in writing, or in graphics.
4-Preparation for graduate studies: Providing sufficient breadth and depth for the success of subsequent graduate studies, post-graduate study and continuing education programs.
5- Preparation for the profession: Providing a broad appreciation of the problems that arise in professional practice, including teamwork, leadership, professional safety, ethics, service, etc.

4. Program accreditation

We have currently applied for accreditation from the APT Organization and also from the European Union (Bologna System).

5. Other external influences

Ministry of Higher Education and Scientific Research/Al-Furat Al-Awsat Technical University

6. Program structure

comments *	percentage	Study unit	Number of courses	Program structure
	10%	28	3	Enterprise requirements
	3%	26	5	College requirements
	87%	134	32	Department requirements
		0	2	summer training
				Other

* Notes may include whether the course is core or elective.

7. Program description

Credit hours		Name of the course or course	Course or course code	Year/level
practical	theoretical			
0	2	Electrical measurements	CE111	The first
2	2	Digital principles	CE121	
2	2	Electronic	CE122	
2	2	Electrical circuits	CE112	
0	3	mathematics1	CE141	
2	1	Calculator applications1	CE151	
3	0	Quarterly engineering drawing	CE161	
3	0	Quarterly electrical drawing	CE113	
3	0	Factor	CE162	
0	2	Human rights and democracy	CE163	
2	2	Electronic circuits	CE223	the second
0	2	Electric fields	CE214	
0	2	Information theory	CE231	
3	2	communication systems/1	CE232	
2	2	Digital applications	CE224	
0	0	Systematic training	CE264	
0	3	mathematics/2	CE242	
2	1	Calculator apps /2	CE252	
3	2	Electrical machines	CE215	
2	2	Microprocessor	CE325	The third
0	2	Antennas	CE333	
3	2	communication systems/2	CE334	
2	2	Electronic circuit design	CE326	
4	2	Communications systems maintenance/1	CE335	
0	3	Digital signal processing	CE336	
0	0	Systematic training	CE365	
2	1	Calculator apps /3	CE353	

0	3	Engineering analyses	CE343	
3	2	communication systems/3	CE437	Fourth
3	2	Advanced communications systems	CE438	
3	2	Communications and computer networks	CE439	
0	2	Communications security	CE4310	
4	2	Communications systems maintenance/2	CE4311	
2	0	project	CE4312	
2	2	control	CE416	
2	1	Calculator apps /4	CE454	
0	2	Engineering Management	CE467	

8. Expected learning outcomes of the programme

Knowledge	
1) The ability to apply knowledge in mathematics, science and engineering a-2) The ability to identify, formulate and solve engineering problems. a-3) The ability to design the engineering system, component, which is a theoretical and practical process to meet the required needs within the field of specialization within a realistic framework in which environmental, economic, social, political and health restrictions are imposed. a-4) Teaching leadership skills, the value and quality of commitment, ethical behavior and respect for others.	Learning Outcomes
Skills	
1) The ability to design and conduct experiments. B-2) The ability to implement and maintain systems. B-3) The ability to design using the latest design and simulation programs. B-4) The ability to use modern engineering methods, tools, and skills necessary for engineering work.	**Subject-specific skills**
(Brainstorming C-2) The ability to analyze C-3) The ability to solve problems C-4) The ability to deduce	**C- Thinking skills**
Dr-1) The ability to work within a team Dr-2) The ability to communicate effectively. Dr-3) The ability to adapt to similar specializations (electronic engineering, information technology engineering)	**General and transferable skills (other skills related to employability and personal development).**

Dr-4) Effective influence on society and the labor market through training and development programs related to specialization and at various levels.	
Value	
Statement of learning outcomes4	Learning Outcomes4
Statement of learning outcomes5	Learning Outcomes5

9. Teaching and learning strategies

The main strategy adopted is to encourage students' participation in the exercises, while at the same time 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. Evaluation methods

The student's evaluation in the educational program depends entirely on oral and written examinations, noting that the passing grade is (50%) and according to the following mechanism:
1- The grade for the annual subjects is divided into two parts (50% undergraduate and 50% final). The division between practical and theoretical is shown in the table below:

<table>
<tr><th colspan="4">Article that does not contain my work</th><th colspan="4">Article containing my work</th></tr>
<tr><td>Theoretical</td><td colspan="3">the exam</td><td>Practical</td><td>Theoretical</td><td colspan="2">the exam</td></tr>
<tr><td rowspan="2">20%</td><td>First semester exam</td><td rowspan="4">Pursuit</td><td rowspan="2">10%</td><td rowspan="2">10%</td><td>First semester exam</td><td rowspan="4">Pursuit</td></tr>
<tr><td rowspan="2">20%</td><td rowspan="2">Second semester exam</td><td>Second semester exam</td></tr>
<tr><td rowspan="2">10%</td><td rowspan="2">Evaluation</td><td>10%</td><td>10%</td><td rowspan="2">Evaluation *</td></tr>
<tr><td>5%</td><td>5%</td></tr>
<tr><td>50%</td><td colspan="3">final exam</td><td>10%</td><td>40%</td><td colspan="2">Final</td></tr>
<tr><td>100%</td><td colspan="3">Total score</td><td>35%</td><td>65%</td><td colspan="2">the total</td></tr>
</table>

* Evaluation is done by the subject teacher and depends on the student's attendance, daily exams, and homework.

2- Dividing the grade for semester subjects into two parts (50% pursuit and 50% final), where the pursuit grade depends on the evaluation only without any theoretical exam, while the final exam grade depends on the theoretical exam only.
3- Some applied subjects (electronic and mechanical workshops) depend only on continuous evaluation during the year without any semester or final exams, as the evaluation represents the final grade.

In addition to continuous monitoring of the student's attendance at the theoretical lecture and laboratory, as the student is considered not to have completed the subject if his absence hours exceed10% of the total hours for that subject.

11. education institution

Faculty members

Preparing the teaching staff		Special requirements/skills (if any)		Specialization		Scientific rank
lecturer	angel			private	general	
	angel					Professor No1
	angel					Assistant Professor No6
	angel					Number teacher7
	angel					Assistant teacher no4

Professional development

Orienting new faculty members

Briefly describes the process used to orient new, visiting, full-time, and part-time faculty at the institution and department levels.

Professional development for faculty members

Briefly describe the academic and professional development plan and arrangements for faculty members such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance standard

Students are accepted into the educational program through several channels
*Firstly/*Admission channels with nominal registration and tuition fees.

1- Central Admission Channel: It is a central electronic program used to distribute students graduating from middle school in the country to Iraqi universities and institutes depending on the student's grade, geographical location, and the admission plan presented by the college or institute.

2– Students are accepted (10%) are the top graduates of morning institutes from the corresponding specialty or close to the program. The student who graduated from the specialty corresponding to the program is accepted in the second stage, while the student who graduated from the nearby specialty is accepted in the first stage.

13. The most important sources of information about the program

The college's website is
http://www.etcn.edu.iq/
The link to the program is:
http://www.etcn.edu.iq/communications/communications.html

14. Program development plan

Annually, before the start of the academic year, each educational program presents the complete plan for the academic year, including courses, workshops, seminars, student activities, cultural, artistic, sporting, and others, in order to make financial allocations and provide other requirements necessary to implement the submitted plan.

Program skills chart

Outputs Learning required from the program															
Value				**Skills**				**Knowledge**				**Essential or optional?**	**name The decision**	**Code The decision**	**the year / the level**
C4	**C3**	**C2**	**C1**	**B 4**	**B 3**	**B 2**	**B 1**	**a 4**	**a 3**	**a2**	**a 1**				

	•	•									•	Basic	Electrical measurements	CE111	The first
	•	•					•		•	•	•	Basic	Digital principles	CE121	
	•	•					•		•	•	•	Basic	Electronic	CE122	
	•	•					•		•	•	•	Basic	Electrical circuits	CE112	
		•									•	Basic	mathematics1	CE141	
•	•	•		•	•		•					Basic	Calculator applications1	CE151	
		•						•			•	Basic	Quarterly engineering drawing	CE161	
	•	•		•				•				Basic	Quarterly electrical drawing	CE113	
		•		•			•	•				Basic	Factor	CE162	
		•	•	•			•	•				Basic	Human rights and democracy	CE163	
•	•	•	•						•	•	•	Basic	Electronic circuits	CE223	the second
•	•	•	•								•	Basic	Electric fields	CE214	
•	•	•	•								•	Basic	Information theory	CE231	
•	•	•	•		•		•		•	•	•	Basic	communication systems /1	CE232	
•	•	•	•				•		•	•	•	Basic	Digital applications	CE224	
				•		•		•				Basic	Systematic training	CE264	

	•	•	•								•	Basic	mathematics/ 2	CE242	
				•	•		•					Basic	Calculator apps /2	CE252	
							•				•	Basic	Electrical machines	CE215	
•	•	•	•		•		•		•	•	•	Basic	Microprocessor	CE325	The third
•	•	•	•							•	•	Basic	Antennas	CE333	
•	•	•	•		•		•		•	•	•	Basic	communication systems /2	CE334	
•	•	•	•		•		•		•	•	•	Basic	Electronic circuit design	CE326	
						•				•		Basic	Communications systems maintenance/1	CE335	
•	•	•	•							•	•	Basic	Digital signal processing	CE336	
				•		•		•				Basic	Systematic training	CE365	
				•	•		•					Basic	Calculator apps /3	CE353	
•	•	•	•								•	Basic	Engineering analyses	CE343	
•	•	•	•		•		•		•	•	•	Basic	communication systems /3	CE437	Fourth
•	•	•	•		•		•		•	•	•	Basic	Advanced communications systems	CE438	

•	•	•	•		•		•		•	•	•	Basic	Communications and computer networks	CE439	
•	•	•	•							•	•	Basic	Communications security	CE4310	
						•				•		Basic	Communications systems maintenance/2	CE4311	
	•	•		•	•				•	•	•	Basic	project	CE4312	
•	•	•	•		•		•				•	Basic	control	CE416	
				•	•		•					Basic	Calculator apps /4	CE454	
	•	•						•	•		•	Basic	Engineering Management	CE467	

Please situation Signal in Squares the interview For outputs Learning Individuality from the program Submissive For evaluation

Course description form

1. name The decision
Electrical measurements
2. Code The decision
3. the chapter / the year
the first
4. date Preparation this the description
5. Available attendance forms
My presence
6. Number of study hours (total)/number of units (total)
N(2)- H(0)- H(4).
7. Name of the course administrator (if more than one name is mentioned)
Name: Salam Mahdi Azouz Email :
8. Course objectives

A- A brief description of the contents of the course: The student studies the theory of measurements, how standards are made for measuring devices, and the types of these devices. B- Prerequisite subjects: elementary mathematics •	**Objectives of the study subject**

9. Teaching and learning strategies	
	The strategy

.Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
		Introduction to measurements		2	1
		Error rate in electrical measurements		2	2

		Static analysis		2	3
		Types of measuring devices		2	4
		, galvanometer		2	5
		moving iron type scale,		2	6
		Ammeter and voltmeter		2	7
		, multi-range measuring devices,		2	8
		, inductance type power meters,		2	9
		archAC,		2	10
		electronic measuring instrument,		2	11
		digital voltmeter,		2	12
		analog to digital conversion,		2	13
		digital scales,		2	14
		digital display systems,		2	15
		Accuracy and sensitivity		2	16
		for digital measuring devices,		2	17
		Digital multimeter		2	18
		, digital frequency meter		2	19
		, Power transformers (principle and types).		2	20
		Vias resistance,		2	21
		potentiometer,		2	22
		bridge and tenson,		2	23
		oscilloscope,		2	24
		Types of voltmeters		2	25
		Electrodynamometer		2	26

1. Course evaluation

distribution Class from 100 on according to mission Assigned With it requester like Preparation Daily And exams Daily And oral And monthly And editorial And reports ....etc

2. Learning and teaching resources

	Required textbooks (methodology, if any)
	Main references (sources)
	Recommended supporting books and references (scientific journals, reports….)

	Electronic references, Internet sites

Course description form

13. name The decision	
Digital principles	
14. Code The decision	
15. the chapter / the year	
the first	
16. date Preparation this the description	
17. Available attendance forms	
My presence	
18. Number of study hours (total)/number of units (total)	
N(2)- H(2)- H(6).	
19. Name of the course administrator (if more than one name is mentioned)	
Name: Hoda Hussein Email :	
20. Course objectives	
• A- A brief description of the contents of the course: The course is based on studying the basic principles of digital systems and circuits.	**Objectives of the study subject**
21. Teaching and learning strategies	
	The strategy

.Course Structure (Digital Principles)					
Evaluation method	**Learning method**	**Name of the unit or topic**	**Required learning outcomes**	**hours**	**the week**
		Number system, Binary		2	1
		codes,		2	2
		logic gates, Simplification of logic gates		2	3
		,Adder circuits, Multi-vibrators.		2	4
		,Counters,		2	5
		Register,		2	6
		Multiplexer		2	7
		,Input/Output devices		2	8
		Logic gates,		2	9
		Implement logic gates, Boolean's algebraic,		2	10
		Demorgan's theorem,		2	11
		Karnaugh map		2	12
		Comparator circuit,		2	13
		half adder,		2	14
		half adder,		2	15
		half adder,		2	16
		,Full adder, r		2	17
		,Full adder, r		2	18
		half subtractor,		2	19
		half subtractor,		2	20
		half subtractor,		2	21
		Full subtractor		2	22
		Full subtractor		2	23
		Full subtractor		2	24
		,Counters,		2	25
		Register,		2	26

3. Course evaluation

distribution Class from 100 on according to mission Assigned With it requester like Preparation Daily And exams Daily And oral And monthly And editorial And reports ....etc

4. Learning and teaching resources	
	Required textbooks (methodology, if any)
	Main references (sources)
	Recommended supporting books and references (scientific journals, reports….)
	Electronic references, Internet sites

. Course name and number: Electrical Circuits
2. Study hours and units: N(2) - P(2) - H(6).
3. Lecturer: Dr. Muhannad Ahmed
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The course contains engineering principles and basics related to electrical circuit networks with continuous and alternating current and theories of their analysis.
   B- Prerequisite subjects: elementary mathematics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Designated outcomes from the course: for the student to become familiar with the foundations of general electrical circuits, direct and alternating current circuits, and theories of electrical network analysis.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.
   Theoretical syllabus:
   Current and voltage, Series and parallel circuits, Analysis theorems, Sinusoidal Alternating Current, AC circuits parameters, Network theorems in AC circuits, Power in AC circuit, Resonance, Poly phase system, Magnetic circuit, Circuit transient.
   Practical style:
   Lab. understanding, understanding measurements devices, Ohm's law, Series and parallel connections, Delta-Star connections, Kirchhoff's theorem, Thevenin and Norton theorem, Superposition theorem, Exchange theorem, High power transfer theorem, Series RL circuit, Series RC circuit, Parallel RL circuit, Parallel RC circuit, Series and parallel RLC circuit, Series and parallel resonance, High power transfer in AC circuit, Power and power factor measurements using wattmeter, Power factor enhancement, Voltage and current in 3-phase AC circuits in star-delta connections, Study of time constant for RL and RC circuit.

. Course name and number: Electronic
2. Study hours and units: N(2) - P(2) - H(6).
3. Teaching: M. M. Thanaa Hassan Youssef
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
A- A brief description of the contents of the subject: The methodological vocabulary of the subject contains the physical foundations of the atom and the electrical charge, in addition to the principles of electronics science and the basic electronic elements.
B- Prerequisite subjects: elementary physics
C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
A- Designated outcomes from the course: The student is introduced to the principles of semiconductor physics, in addition to the types, analysis, composition, properties, and uses of electronic components that are made from semiconductors.
B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.
Theoretical syllabus:
The atoms, Semiconductors, PN Junction, Diode, Bipolar junction transistor, Transistor Equivalent circuit, Field, effect transistor.
Practical style:
Learning how to use the electronic devices, The properties of diodes in forward and reverse bias, Half wave rectifiers, Full wave rectifier by bridge, Full wave rectifier by transform, Clipper circuit (positive, negative, complex), Doublers DC voltage circuit (triple) and quarter), Zinger diode properties in forward and reverse bias, Using zinger diode of voltage divider with constant resistance load and changed resistance load, Common base transistor properties, Common emitter transistor properties, Common base amplifier (finding voltage gain and current gain), Common emitter amplifier (finding voltage gain and current gain) and drawing the frequency response curve, H-parameters measurements for common emitter, H-parameters measurements for common base, Using transistors in organizing voltage circuits, Field Effect Transistor (FET) properties, Common source amplifier, common drain amplifier, light emitting diode.

. Course name and number: Mathematics
2. Study hours and units: N(3)- H(0)- H(6).
3. Lecturer: AMD Asaad Samoum Daghal
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The course contains topics related to basic mathematics for engineering students
   B- Prerequisite subjects: elementary physics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Specific outcomes from the course: Helping the student to know the laws and mathematical problems necessary to solve simple and complex electrical circuits.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.
Theoretical syllabus:
Matrices and Determinants, Functions, Trigonometric functions and Identities, Derivatives, Integration, Complex numbers, Vectors and parametric equations, Polar coordinates, Conic sections.

. Course name and number: Basics of Computers/1
2. Study hours and units: N(1)- P(2)- H(4).
3. Lecturer: M. M. Samir Abd Shahid Muhammad
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
A- A brief description of the contents of the course: The student studies the basics of electronic computers, their physical components, and their historical development, in addition to the operating systems used and their accessories.
B- Prerequisite materials: None
C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
A - Specific outcomes from the course: In order for the student to be able to know the basic physical components of electronic computers and their development over time, in addition to understanding the operation of operating systems (MS Daws and Windows) and some printing and drawing programs.
B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.
Theoretical syllabus:
Computer Fundamentals, Computer Programming and Languages, MS-DOS operating system, Internal command, Windows operating system, understanding My computer window, understanding control penal window, Window media player, Accessories, Paint program, Word pad & Not pad, Computer Viruses.
Practical style:

1. Course name and number: Engineering drawing
2. Study hours and units: N(0) - H(3) - H(3).
3. Teaching: M.D. Ahmed Hamoudi Ali
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the material: The material contains vocabulary related to the foundations of engineering drawing, projections and their types.
   B- Prerequisite materials: None
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Dedicated outcomes from the course: The student must be able to determine the importance of engineering tools and methods of using them in drawing engineering views and projections.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Syllabus:

Important of engineering drawing, Engineering drawing instruments, Sheet layout and title block, kind of inies and their application, Lettering, orthographic drawing, dimensions, pictorial drawing, missing views, sectional views.

1. Course name and number: Electrical Drawing
2. Study hours and units: N(0) - H(3) - H(3).
3. Teaching: M.D. Ahmed Hamoudi Ali
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the material: The material contains vocabulary related to the basics of electrical drawing and how to draw electrical and electronic elements
   B- Prerequisite materials: Engineering drawing
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Designated outcomes from the course: The student must be able to read and design electrical and electronic maps.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Syllabus:

Fundamental of electrical & electric drawing sheet layout, Electrical & electronic symbols, Kind of electrical and electronic drawing, Schematic diagram single line (one line) diagram, Connection (wiring) diagram, Interconnection diagram, Drawing different kinds of electrical & electronic circuit, Fluorescent Lamp, Logic gates, Amplifier, Integrated circuits.

1. Course name and number: Electronic Workshops
2. Study hours and units: N(0) - H(3) - H(3).
3. Teaching: Technician Mazen Muhammad Jassim
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the material: The material contains methodological vocabulary related to how to use measuring and welding devices, types of electronic boards, and how to connect components to electronic boards. In addition to identifying, reading and determining the values of various electronic elements.
   B- Prerequisite materials: Engineering drawing
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The assigned outcomes of the course: The student must be able to
   1- Use various types of measuring devices, caustics, and aspirators.
   2- Knowing the properties of various types of electronic boards.
   3- Knowing, reading and determining the values of various electronic elements and integrated circuits and how to connect them to electronic boards.
   4- Mastering the skills of soldering and removing electronic components on the printed board.
   5- Knowledge of the basics of electrical installations.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Syllabus:

Learn how to use different measuring devices in the workshop, Learn how to use caustic, types of caustic, welding by using caustic, Types of welding, Sucker solder and Solder removal, Learn different types of printing board, Different types of electronics components, Parallel resistance circuit, Types of capacitance, Parallel capacitance circuit, Switch types, Fuses types, Inductor types, Transformer types, Semi conductor, Electrical installation, Integrated circuit, Caustic used in integrated circuit welding, Learn how to read electronic board, Students learn to design electronic board on the printed board.

1. Course name and number: Electronic Workshops
2. Study hours and units: N(0) - H(3) - H(3).
3. Teaching: Technician Hassan Abbas Kazem
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The course contains methodological vocabulary related to knowledge and how to use various devices and equipment in various types of mechanical workshops.
   B- Prerequisite materials: Engineering drawing
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Specific outcomes from the course: The student must be able to know and use most mechanical workshop tools and manufacturing techniques in various workshops.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Syllabus:

Occupational Safety, Foundry Workshop, File type Workshop, Carpentry Workshop, Turnery workshop, Welding types Workshop.

1. Name and number of the course: Human Rights
2. Study hours and units: N(2)- H(0)- H(4).
3. Lecturer: Dr. Haider Abdel-Jalil
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The vocabulary of the human rights course focuses on the basic principles of human rights and their types.
   B- Prerequisite materials: None
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - Specific outcomes from the course: The student should be able to know human rights and determine the types of rights and how to acquire them.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Human rights in human history, Human rights in divine religions, Human rights, International confession of human rights, Territorial confession of human rights, NGO and its role in the protection of human rights, Women rights, Children Rights, Elections and human rights, Human rights resources in Iraq, Legal resources for human rights, Human rights resources, Civil Rights, Political & economical rights, Social & cultural rights.

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1. Course name and number: Digital Applications
2. Study hours and units: N(2) - P(2) - H(6).
3. Teaching: M.M. Huda Hussein
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The course's vocabulary focuses on applied digital circuits such as counters, shift registers, and asynchronous combinational circuits, in addition to types of memory.
   B- Prerequisite materials: Digital principles
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course: The student will be able to design various types of counters, shift registers, and synchronous and asynchronous combination circuits, in addition to defining memory, its types, and capacity.
   A - Specific outcomes from the course: The student should be able to know human rights and determine the types of rights and how to acquire them.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Counters, Shift Register, Combinational circuits, Synchronous sequential circuit, Asynchronous sequential circuit, Test of logic circuit, Memory, D/A and A/D converter, Introduction to Microprocessor.

Practical syllabus

Serial counter, Up counter, Down counter, Parallel counter, Johnson & ring counter, Decade counter, Shift right register, Shift left register, Sequence detector, Compound counter, 4x1 multiplexer using logic gates, 8x1 multiplexer using IC 74151, Decoder 2x4 using logic gates, parity checker, digital to analog converter.

1. Course name and number: Communications Systems/1
2. Study hours and units: N(2) - H(3) - H(6).
3. Teaching: M. Ahmed Hassan Hadi
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course's contents: The course's vocabulary focuses on defining signals and noise, their types, and how to represent and analyze them, in addition to the types of analogue modulation.
   B- Prerequisite materials: Digital principles
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The intended outcomes of the course: The student should be able to know
1- Definition, analysis and generation of signals and noise.
2- Definition of linear embedding and detection methods and their types and generation methods.
3- Definition of pulse modulation
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Signals, spectrum, filters, Noise, Linear modulation, Amplitude modulation, Exponential modulation, Frequency modulation, Noise in CW modulation, Sampling and pulse modulation,

Practical syllabus

Learn the lab. devices and its working, Studying the tuning circuit (series resonance & parallel resonance), Operation of active and passive low pass and high pass filters, Design of band pass filter and band stop filter, Calibration of voltage controlled oscillator, RF radio amplifier with tuning circuit, Equalizer effects on the radio amplifier operation, Amplitude modulation circuit by transistor, Balance modulator circuit, Modulation factor using trapezoidal method, Single side band generation, Demodulation of Amplitude modulation signal using diode, Demodulation of AM signal using synchronous detector, AM signal analysis using spectrum analyzer, Mixer operation using diode and transistor and compare between its, Automatic gain control circuit, Frequency modulation, Demodulation of FM signal, Automatic frequency control circuit, Pulse amplitude modulation and demodulation, Pulse width modulation and demodulation, Pulse position modulation.

1. Course name and number: Electromagnetic fields
2. Study hours and units: N(2)- H(0)- H(4).
3. Lecturer: Prof. Dr. Ghofran Mahdi Hatem
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the material's contents: The material's vocabulary focuses on defining the theory of electromagnetic fields and Coulomb's law and magnetic flux density. In addition to defining energy and voltage and determining their equations. In addition to the Laplace and Beson equations.
   B- Prerequisite subjects: mathematics and vectors
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The assigned outcomes of the course: The student should be able to
1- Knows the theory of electromagnetic waves.
2- Coulomb's law defines the magnetic flux density, energy and voltage.
3- Knows conductors, insulators, capacitance, Laplace and Beson equations, and the study of the magnetic field.
4- Knows Maxwell's equations and the regular wave plane.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Vector Analysis, Coulomb law, Electric Flux Density, Energy and Potentials, Conductors, Dielectric and Capacitance, Pisson and Laplace Equations, The Steady Magnetic Field, Time varying and Maxwell fields equations, The Uniform Plane Wave.

1. Course name and number: Information theory
2. Study hours and units: N(2)- H(0)- H(4).
3. Teaching: Mr. Ali Muhammad Saeed
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course's contents: The course's vocabulary focuses on probability theory, information, distribution function, channel types and capacity, and channel coding. In addition to the possibility of error, we then discuss some compression techniques in all types of multimedia signals.
   B- Prerequisite subjects: elementary mathematics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The assigned outcomes of the course: The student should be able to
1- Knows probability theory and methods for finding probabilities.
2- Knows the distribution function and its types.
3- Knows the channel, calculates the channel capacity, and encodes it.
4- Compresses various multimedia signals using multiple compression techniques
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Probability theory, Information and quantification, Distribution function, Types of channels and channel capacity, Error probability and optimum decision threshold (ODT), Source coding, Channel coding, Some compression techniques, Voice, image, and video coding, Voice, image, and video compression.

1. Course name and number: Mathematics/2
2. Study hours and units: N(3)- H(0)- H(6).
3. Lecturer: AMD Asaad Samoum Daghal
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course contents: The course vocabulary focuses on series, Fourier series, functions of variables, multiple integration, vector mathematics, in addition to differential equations.
   B- Prerequisite subjects: elementary mathematics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The assigned outcomes of the course: The student should be able to
1- Knows the series, Fourier series, and power series.
2- Defines functions with two variables, their graphing, and their differentiation.
3- Knows double and triple integrals and calculates areas and volumes, in addition to triple integrals in cylindrical and spherical coordinates.
4- Solving differential equations.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Sequence and series, Fourier series and transform, Functions for two or more variables, Multiple Integral, Topics in vector calculator, Ordinary differential equation of first order, Ordinary differential equations of second order, High order differential equations, System of differential equations, Power series .

1. Course name and number: Electrical machines
2. Study hours and units: N(2) - H(3) - H(6).
3. Teaching: M. M. Mustafa Taher
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course's contents: The course's vocabulary focuses on an introduction to electrical machines and their types (direct and alternating current motors and generators). In addition to studying, analyzing and maintaining current and voltage transformers and their equations.
   B- Prerequisite subjects: electrical networks, electronic principles, elementary mathematics.
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - The assigned outcomes of the course: The student will be able to know, test, perform maintenance, and calculate torques for single-phase and three-phase direct and alternating current motors and generators. In addition to low and high voltage electrical transformers.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Introduction to electrical machines, EMF equation, DC generators, Losses and Efficiency of DC generators, DC Motors, Speed control of DC motors, Starting of DC motors, Testing of DC machines, Uses of DC motors, Transformers, Transformer Equivalent Circuit, Tests on transformers, current and voltage transformers, Three phase induction motors, Equivalent circuit of 3-phase IM, Tests on IM, Losses, power stages, and Efficiency, Starting and speed control of 3-phase IM, Single phase motors, Equivalent circuit of single phase IM, Tests on single phase IM, Losses and Efficiency, Synchronous Machines, Alternator equivalent circuit, Load characteristic of alternator, Synchronous Motors, Load characteristic of synchronous motor, Torque equation, Special purpose motors, DC Servomotors and AC Servomotors, Conversion from AC to DC.

Practical syllabus

Introduction to Industrial safety and security principles, Magnetizing curve for separately excited and self excited generators, EMF vs. speed curve, EMF vs. speed curve for shunt DC generator, Load, internal and external characteristic curves for separately excited DC generator, Load, internal and external characteristic curves for shunt DC generator, Load, internal and external characteristic curves for series DC generator, Load, internal and external characteristic curves for compound (cumulative and differential) DC generator, Parallel operation of two separately excited DC generators, Load characteristic, torque curve, and efficiency for DC series motor, Load characteristic, torque curve, and efficiency for DC shunt motor, Speed control for DC shunt motor, Losses and Efficiency calculation for DC machine, Open circuit and Short circuit Tests on single phase transformer, Load Test on single phase transformer, Parallel operation of two transformers, Load Test on three phase transformer, Starting methods of 3-phase Induction Motors , Open circuit and Short circuit Tests on 3-phase IM, Speed control methods of 3-phase IM, Speed control of 3-phase IM by varying the frequency, Load Test on three phase IM, Measuring the Starting current and Starting torque for 3 -phase IM, Measuring the maximum torque for 3-phase IM, Load test on single phase IM, Losses and Efficiency, Load characteristic of alternator, Measuring Input and output power, Measuring the synchronous resistance of the alternator, Torque equation and methods of starting of synchronous Motors, Study the influence of exciting current on Synchronous motor characteristics, Load test on synchronous motor, measuring Input, output power and max. output power.

1. Course name and number: Electronic circuits
2. Study hours and units: N(2) - P(2) - H(6).
3. Teaching: M.M. Ahmed Adnan
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course's contents: The course's vocabulary focuses on studying operational amplifiers, power amplifiers, feedback amplifiers, and oscillators.
   B- Prerequisite subjects: Electronic principles
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Designated outcomes from the course: The student will be able to identify, analyze, and design operational amplifiers, power amplifiers, and feedback amplifiers. In addition to oscillators and their types.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Operational amplifiers, Linear analog system, Power amplifiers, Feedback amplifiers, Oscillator.

Practical syllabus

Inverter amplifier circuit by operational amplifier, Non-inverter amplifier circuit by operational amplifier, Summation amplifier circuit by operational amplifier, Subtract or amplifier circuit by operational amplifier, Integrator amplifier circuit by operational amplifier, Differential amplifier circuit by operational amplifier, Half wave rectifier circuit by operational amplifier, Full wave rectifier circuit by operational amplifier, Compactor circuit by operational amplifier, Smith trigger circuit, Logarithmic amplifier circuit, Low pass filter circuit by operational amplifier, High pass filter circuit by operational amplifier, Square wave generator circuit by operational amplifier, Triangle wave generator circuit by operational amplifier.

1. Course name and number: Calculator applications/2
2. Study hours and units: N(1)- P(2)- H(4).
3. Teaching: M.D. Alia Abdel Hussein
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course contents: The course vocabulary focuses on studying the basics of computer networks and then going into the details of the Visual Basic topic.
   B- Prerequisite subjects: Computer basics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Designated outcomes from the course: The student should be able to know the basics of computer networks. In addition to that, learn all the details about Visual Basic.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Networks fundamentals, Visual Basic, Arithmetic Expressions in VB, Functions of VB, IF condition, Looping, Tool box, creating a stand-alone VB application, adding menus to an application, creating VB executable file, VB package & deployment wizard, Text files , Drawing techniques by pset, current Controls, rich text box, slider, tabbed dialog, multiple forms, Examples and deferent programs.

1. Name and number of the course: Democracy
2. Study hours and units: N(2)- H(0)- H(4).
3. Teaching: M.M. Haider Abdel Jalil
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course's contents: The course's vocabulary focuses on the study of democracy and freedom.
   B- Prerequisite materials: None
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The intended outcomes of the course: The student should be able to understand the basics of freedom and democracy.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Freedom & Democracy, Relativity in freedom, General Freedom guaranties, General freedom divisions, Individual Freedoms, Democracy & political systems, Democracy types, Dictatorship and its specification, Concepts about democracy, Democracy in Greek Civilization VS. Current democracy, Current crisis of democracy, Civil & political rights, Individual importance and its relationship with nation and regime, Importance and specifications of autonomy, Main portions of a country.

1. Course name and number: Microprocessor
2. Study hours and units: N(2) - P(2) - H(6).
3. Teaching: M.D. Salem Mohsen Wadi
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course's contents: The course's vocabulary focuses on providing a basic introduction and the historical development of microprocessors8085. We discussed the physical structure of the processor and its programming. It also talks about memory, input and output devices, and how to connect them to the microprocessor. In addition, interrupts and their operation with the 8085 processor are discussed.
   B- Prerequisite materials: digital principles and applications.
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - Outputs allocated from the course: The student will be able to describe the physical components of the microprocessor and know the operation of the legs in the integrated circuit of the processor.8085. In addition, developing the student's skills in programming the processor and solving some engineering problems, especially those related to control using the 8085 microprocessor.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Architecture of 8085 microprocessor. Instructions set and programming of 8085 microprocessors. Stack and Subroutine, Time delay and Counters, Interrupts, Addressing modes, Pin out of 8085 microprocessor, Buses system, and Control signals, Memories, Fetch and execute cycle, Interfacing I/O devices, 8086 microprocessor Block diagram; architecture; registers; pin out; Introduction to programming.

Practical syllabus

Understanding the kit program, Data transfer operations, Arithmetic operation (8-bit summation), Logic operation (multiply by 2 using rotate instruction), Clear of memory locations, Summation of odd order numbers, 1s and 2s complement for 8-bit number 16 bit operations (summation and complement), 8-bit subtraction, 8-bit multiplication, Find larger number, BCD to binary, Binary to BCD, Hexadecimal to ASCII code, ASCII TO binary, I/O ports, Time delay, Maximum repetition for block of data,, 8-bit division.

1. Course name and number: Antennas
2. Study hours and units: N(2)- H(0)- H(4).
3. Lecturer: Professor Haider Al-Battat
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course contents: The course vocabulary focuses on presenting Maxwell's equations before defining antennas and defining their parameters, types and measurements. In addition, there is talk about the propagation of radio waves and transmission lines for electromagnetic signals.
   B- Prerequisite materials: electromagnetic fields
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - Outputs allocated from the course: The student will be able to understand Maxwell's equations, define antennas, and determine their types and how to connect them. And to conduct some measurements to develop the student's skills in designing antennas. Then, it studies the propagation of radio waves and their transmission lines.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Maxwell equations, Antenna Definition, Antenna Parameters, Thin Linear Antenna, Antenna Arrays, Special Antenna, Antenna Measurements, Radio Wave Propagation.

1. Course name and number: Communications Systems/2
2. Study hours and units: N(2) - H(3) - H(6).
3. Teaching: Prof. Dr. Bashar Jabbar Hamza
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the material: The material's vocabulary focuses on pulse-coded modulation, and then talks about digital modulation. After that, channel coding and spread spectrum are discussed.
   B- Prerequisite materials: Communications systems1 - Advanced mathematics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The assigned outcomes from the course: The student should be able to define pulse-coded modulation. To define all types of digital embeddedness and methods of generating and detecting them. Know the channel coding and spread spectrum.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Pulse Code Modulation (PCM), Digital Modulation(ASK, FSK, PSK, DPSK, QAM, QPSK, MSK, MFSK, M-ray PSK & M-ray QAM), Channel coding, Spectrum Spread.

Practical syllabus

Pulse generation circuit, Sampling circuit, PAM modulation & demodulation, PPM modulation & demodulation, PCM modulation & demodulation, ASK modulation & demodulation, FSK modulation & demodulation, PSK modulation & demodulation, PFM modulation & demodulation, PWM modulation & demodulation, Random coding circuit , Difference modulation & demodulation.

1. Course name and number: Digital Signal Processing
2. Study hours and units: N(3)- H(0)- H(6).
3. Teaching: M.M. Qusay Jalil
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the material: The material focuses on continuous and pulsed signals and analyzes them using the Fourier transform, convolution, the Fourier transform for pulsed signals, the Laplace transform andZ, in addition to digital filters.
   B- Prerequisite materials: Communications systems1 - Advanced mathematics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Customized outcomes from the course: The student learns to understand mathematical analyzes of continuous and discrete signals and how to process them.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Continuous and discrete signals and systems, Convolution, Fourier analysis continuous signals and system, Discrete Fourier transform (DFT), Fast Fourier transform (FFT), The Laplace transform and the z-transform, solution of difference equations, Feedback system, Signal processing, Filtering.

1. Course name and number: Design of electronic circuits
2. Study hours and units: N(2) - P(2) - H(6).
3. Lecturer: Dr. Nasser Hussein
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A - A brief description of the contents of the material: The material's vocabulary is divided into two parts, the first of which talks about the power electronics system, including the semiconductors used in power electronics such as power diodes and power transistors, the working principle and applications of each of the triacs, diacs, and thyristors, in addition to circuits for rectifiers, interrupters, inverters, and charge transfer in semis. Connectors. While the second part of the vocabulary talks about integrated circuit manufacturing techniques.
   B- Prerequisite materials: electronic circuits - electronics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - Specific outcomes from the course: The course aims to teach the student the basics, analysis, and design of electronic circuits related to power electronics, as well as teaching the student the principles of manufacturing electronic elements and integrated circuits.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Power electronics systems, Power semiconductor diode and transistor, Power transistor, Thyristor principle and application, Choppers, Voltage controller, Charge transport in semiconductor, Integrated circuit fabrication and technology, Epitaxy and oxidation, Fundamental of LSI and VLSI, CAD, electronic design automation, advantage of CAD, hardware design methodology, FPGA/PLD, design of FPGA/PLD, ASIC, integrated circuit and some device applications.

Practical syllabus

Characteristics of thyristor, Trigger thyristor by AC current, Trigger thyristor by DC current, Half- wave rectifier of (RL) without freewheeling diode, Half- wave rectifier of (RL) with freewheeling diode, Full- wave rectifier of thyristor, Trigger traic by AC current, Trigger traic by DC current, A stable Multi-vibrator (AMV), Mono-stable Multi-vibrator (MMV), The light newsmen by (555), Square wave generator by (555), A stable Multi-vibrator with Large time, Circuit of logic test, Square wave generator by NAND gate.

1. Course name and number: Communications Systems Maintenance/1
2. Study hours and units: N(2)- P(4)- H(8).
3. Teaching: M.M. Yasser Muhammad Abd Shabib
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course's contents: The course's vocabulary focuses on maintaining computers and their accessories, including output and input devices, memory, and others.
   B- Prerequisite materials: electronic circuits - electronics
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Customized outcomes from the course: The course aims to provide the student with maintenance skills for electronic computer devices and all their accessories.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Computer System Overview, Power Supply, Motherboards, Bus Type, I/O (RS-232, parallel, PS2, USB), Memory, CMOS; [CMOS Battery, CMOS setting (Date, Time, HDDs, FDDs, Memory, Booting Sequence, System resources, Power Management, Passwords, Virus Protection], System Recourses, Floppy Disk, CD (drive, media),CD-ROM, CD -R,CD-RW, DVD (drive, media), DVD-R, DVD-RAM,DVD-ROM,DVD+R, Drives Controllers, HDD Partitioning, File Systems, Audio cards, Video Cards, Monitors Overview and Important Concepts , Cathode Ray Tubes CRT, Liquid Crystal Displays LCD, Plasma Display Panels PDP, Touch Screens, Printers, Operating Systems, Hardware and Software Troubleshooting.

Practical syllabus

Power Supply, Motherboard Identification, Front Panel Connectors, CPU Installation, RAM Installation and Upgrade, HDD and CD drive Installation and Configuration (Master -Slave Settings), BIOS settings, HDD preparation (Formatting and Partitioning), Win XP Installation, Dual Boot in Win XP, Win XP Recovery Console, Win XP boot up Menu, System tools of Win

1. Course name and number: Engineering analyses
2. Study hours and units: N(3)- H(0)- H(6).
3. Lecturer: Professor Ahmed Hamoudi
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the subject: The subject's vocabulary includes a study of the Laplace and F transformsz, in addition to partial differential equations, analysis functions, and complex integrals. The other part of the course studies numerical analyses, which includes the numerical method in linear algebra, solving nonlinear equations, and the numerical solution of ordinary differential equations.
   B- Prerequisite subjects: Mathematics/1 - Mathematics/2
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - Customized outcomes from the course: The course aims to teach the student Laplace transforms and complex integration, in addition to numerical analyzes and their application with computer programs.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

The Z-trans formation, Laplace transformation, Partial differential equations, Complex analytic functions, Complex Integrals, Special functions, Numerical method in linear algebra, Solution of nonlinear equation:-fixed point, Numerical integration, Numerical solution of ordinary differential equations.

1. Course name and number: Calculator applications/3
2. Study hours and units: N(1)- P(2)- H(4).
3. Lecturer: M.D. Alia Abdel Hussein Lafta
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The course's vocabulary is divided into two parts, the first related to studying the AutoCAD program and the second the MATLAB program.
   B- Prerequisite materials: calculator basics and programming principles
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The intended outcomes of the course: The student will be able to understand the basics and applications of AutoCAD and MATLAB.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Syllabus

fundemantals of Autocad, drawing commands, command modifications, Onsap, Dimensions, Text & hatch, control drawing properties,block & attributes, 3-deminsions drawing, 3D surfaces, 3D solids, introduction to Matlab, Matlab windows, Program writing by Matlab, Control commands, Looping commands, Matrix in Matlab, Matrix mathematic in Matlab, Function drawing in Matlab, 3-deminsions in Matlab.

1. Course name and number: Communications Systems/3
2. Study hours and units: N(2) - H(3) - H(6).
3. Teaching: Prof. Dr. Bashar Jabbar Hamza
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The course focuses on space communications systems via satellites, including satellite orbits and analysis of the path of the communication signal from the satellite to the Earth and vice versa, in addition to transmission techniques, multiple influence, and multi-radiation satellite networks.
   B- Prerequisite materials: Communications systems/1 - Communications systems/2
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - Outputs allocated from the course: The student will be able to understand the satellite communications system, its working principle, and analyze the communication signal across the path between ground stations and the satellite. Study and understand satellite transmission techniques.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Introduction to satellite system, Link analysis, transmission techniques, Multiple accesses, Multi-Beam satellite network.

Practical syllabus

Characteristics values of a screened line, Basic set up, The radiation pattern for loop antenna, Pulse behavior of a line, Amplitude shift keying signals(ASK), Pulse amplitude modulation (PAM), Attenuation measuring along line, Noise sensitivity of tow-wire line, Standing wave, SWR measurement, The matching, The radiation pattern for YAGI, Frequency shift-keying Signal (FSK), Phase shift keying signals (PSK), SWR, The matching, Input resistance of a line with no-load, short circuit and matching.

1. Course name and number: Communications Security
2. Study hours and units: N(2)- H(0)- H(4).
3. Lecturer: M. M. Yasser Muhammad
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the material: The material includes block and chain encryption techniques after the introduction and old encryption techniques. In addition to systems for documenting confidential information and digital signatures.
   B- Prerequisite subjects: Mathematics/2 - Information theory - probability
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Designated outcomes from the course: The student will be able to understand communications security techniques and information encryption techniques.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Introduction to communication security, Modular arithmetic, Classical encryption techniques, Block cipher and data encryption standard (DES), Advanced encryption standard (AES), Multiple encryption, Block cipher modes of operation, Stream ciphers and RC4, Public-key cryptography, RSA algorithm : description of the algorithm, Diffie-Hellman key exchange, Message authentication, Hash and MAC algorithms, Digital signatures and authentication protocols, Security applications on computer networks.

1. Course name and number: Communications and computer networks
2. Study hours and units: N(2) - H(3) - H(6).
3. Teaching: M.M. Laith Wajih Abdullah
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the material: The material includes vocabulary about computer networks with all their related network layers and the protocols used at each layer of the network. NetworkWAN. In addition to some network security techniques.
   B- Prerequisite materials: Communications systems/1 - Communications systems/2
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Specific outcomes from the course: The student will be able to understand the work of computer networks, their layers, and the protocols for each layer. In addition to giving students skills in connecting computer networks, tracking faults, and maintaining them as hardware and software components.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Networks; overview and important concepts, Networking Models, Physical Layer, Data-link layer protocols, Layer2 devices, Network Layer, Transport Layer, TCP/IP application layer protocols, Security, WAN.

Practical syllabus

NIC installation, Cat 5e cabling, cross and straight through, Pear to Pear 2- PC Network, LAN via Switches, Extended star LAN, Sharing (folders, drives), Sharing Printers, Remote Desktop Connection, Privileges and Security in Win XP, Ad hoc WLAN, Infrastructure WLAN via AP, AP as (Client, PTP bridge, PTMP bridge), WLAN security (MAC filtering, WEP, WAP), Routers, Subnetting (Class A, Class B, Class C), Utilities (ping, Ipconfig , telnet,traceout, nslookup), Internet Connection Configuration and Sharing, Web Site Design (HTML, ASP), Win Server 2003 Installation, Administration and configuration of Win Server 2003.

1. Course name and number: Advanced Communications Systems
2. Study hours and units: N(2) - H(3) - H(6).
3. Teaching: AMD Wasan Kazem Saad
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The subject's vocabulary is divided into two parts. The first is about the study of optical communications with all its related principles, including the principles of communication via optical cable and the techniques of modulation, attenuation, and detection. The second part relates to studying wireless communications systems by taking a general overview of them and then studying their types and the technologies present in each type.
   B- Prerequisite subjects: Physics of Light - Communications Systems/1 - Communications systems/2
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - Specific outcomes from the course: The student will be able to understand optical communications, optical signal generation techniques, modulation and detection, in addition to attenuation, its causes and methods of treatment. Understanding optical cable and the principle of light transmission through optical cable. Understanding wireless communications systems and mobile networks, their operation, and maintenance skills.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Overview of optical communication systems, Review of optics: light theories, Characteristics of optical fibers, Optical sources and transmitters, Optical detectors and receivers, Optical amplifier, EDFA, Repeater, Wavelength division multiplexing WDM, Optical telecommunication network, SDH and SONET, Overview of wireless communication system, Introduction to cellular system, Mobile communication system, Wireless network, Introduction to microwave communication system, Waveguide, Microwave components and semiconductors, Microwave telecommunication system architecture of the networks, RADAR system.

Practical syllabus

Power characteristics of transmit diodes, Attenuation measuring on fibers, Attenuation at connection points, Transmission of AC voltage, Transmission of 2 analog signals in frequency division multiplex, Transmission of frequency-modulated signals, Transmission of pulse-frequency modulated signals, Transmission of a PCM signal, Spectral sensitivity of the infrared receiver, Attenuation of the transmission line (Law of Photometric Distance), Radiation characteristic of the transmit module, Transmission of AC voltage, Transmission of frequency-modulated signals, Transmission of a digital signal in the Modulated operating mode , Transmission of a PCM signal.

1. Course name and number: Communications Systems Maintenance/2
2. Study hours and units: N(2)- P(4)- H(8).
3. Teaching: M. Qusay Jalil
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the material: The material includes vocabulary related to the process of maintaining electronic devices and communications devices, for example, telegraph devices, remote location determination systems, land switches, and mobile network switches.
   B- Prerequisite subjects: Physics of Light - Communications Systems/1 - Communications systems/2
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- Designated outcomes from the course: The student will acquire the skills of identifying malfunctions and maintaining various communications devices.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Element of electrical circuit, Characteristics and usage of Thyristor, General packet radio system, Normal telephone, Telegraph, closed circuit working, Differential duplex circuit, Telegraph distortion, Global Positioning System(GPS), External telephone network, Block diagram of telephone exchange, Global system for mobile network (GSM), Architecture of the GSM network, Handover, Frequency reuse, Construction of mobile equipment, Infrared, Bluetooth.

Practical syllabus

Learning tools and instruments in the lab, Explain the mobile circuit and its working, The Dismantling of the mobile device, training to welding some small part of mobile, check the mobile monitor, types of mobile batteries, Learning wire PBX, maintenance of the wire PBX , Learning wireless PBX, Learning fax device and its maintenance, Learning the microwave devices and its maintenance, Learning the optical fiber and its maintenance, Learning the satellite repeater, Learning earth stations.

1. Course name and number: Control
2. Study hours and units: N(2) - P(2) - H(6).
3. Teaching: Professor Ahmed Taha Abdel Sada
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The course includes vocabulary on control, methods of mathematical analysis of moving systems, time response analysis, and constant error states for systems, in addition to methods for measuring system stability. And design of control systems.
   B- Prerequisite subjects: Mathematics/2 - Engineering analyses
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - Outputs allocated from the course: The student will be able to represent moving systems mathematically, analyze the mathematical representation, analyze the stability of the system, and understand its response. Possessing the skills of designing control systems based on the frequency response of the system.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Theoretical syllabus

Introduction to control system, Mathematical model of dynamic system, Block diagram, Time response analysis, Steady-state error response, System stability, Root-locus analysis, Frequency response analysis, Nyquist stability analysis, Design of control system from frequency response, lead compensator , lag compensator, lead-lag compensator.

Practical syllabus

Open & Closed loop systems, Simulink Overview, Time response of First order system Time response of First order system Using M-FILE, Residues value of First order system, Error steady state, Practical applications of 1'st order system, time response of 2 'nd order system, Characteristics of 2'nd order system, Time response Using M-FILE Error steady state TO 2'nd order system, Pode plot of 2'nd order system, Analog communications system using Simulink, Digital communications system using Simulink, Nyquist theorem to 2'nd order system, Practical applications to 2'nd order system USING Simulink.

1. Course name and number: Calculator applications/4
2. Study hours and units: N(1)- P(2)- H(4).
3. Teaching: M.M. Samir Abdel Shahid
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the course's contents: The course's vocabulary is divided into two topics, the first related to a programpower point and the other about the C++ program.
   B- Prerequisite materials: calculator basics - programming principles
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A- The intended outcomes of the course: The student should be able to understand, analyze and write a program written in C++. The student must be able to understand the operation of the programPower point and how to make a demo using this program.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Syllabus

Power point program overview, Slide design, Animation design, Understanding operation of program tools, Introduction to C++, Pointers, Strings, Structures, Introduction C Preprocessor, File handling.

1. Course name and number: Industrial Management
2. Study hours and units: N(2)- H(0)- H(4).
3. Lecturer: Professor Ahmed Hamoudi
4. Methodological and auxiliary books (title, author, year):
5. Special information about the course:
   A- A brief description of the contents of the course: The course includes vocabulary related to project and resource management techniques, production management, and methods for increasing production and profits. In addition to topics related to quality management and quality control.
   B- Prerequisite materials: calculator basics - programming principles
   C- Is the course compulsory? Optional: Compulsory?
6- Objectives assigned to the course:
   A - The assigned outcomes from the course: The student will possess leadership skills, project management, techniques for improving production, increasing profits, and dealing with quality standards and quality control.
   B- Indicate explicitly which of the student outcomes mentioned in the third standard will be achieved from this course or any other outcomes
7- A brief list of the materials that will be covered in the course.

Syllabus

Preview, Tests of statistical hypotheses, Analysis of variance (ANOVA), Linear programming (LP), Transportation and Assignment models, Network planning, Sequencing models, Replacement and maintenance models, Inventory models, ISO, Quality control, Reliability.