Undergraduate Degree Program Catalogue | 2023-2024 |
دليل البرنامج الدراسي

Al-Furat Al-Awsat Technical University

Bachelor of Science Honours (B.Sc. Honours) – Laser and Opto-Electronics Technical Engineering Dept.
بكالوريوس علوم – هندسة تقنيات الليزر والاكترونيات البصرية

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة الفرات الأوسط التقنية

الكلية/ المعهد: الكلية التقنية الهندسية النجف

القسم العلمي: قسم هندسة تقنيات الليزر والبصريات الالكترونية

اسم البرنامج الأكاديمي او المهني: بكالوريوس هندسة تقنيات الليزر والبصريات الالكترونية

اسم الشهادة النهائية: بكالوريوس في هندسة تقنيات الليزر والبصريات الالكترونية

النظام الدراسي: مسار بولونا

تاريخ اعداد الوصف: 2024/2/20

تاريخ ملء الملف: 2024/2/20

التوقيع

دقق الملف من قبل : شعبة ضمان الجودة والأداء الجامعي

التوقيع

اسم مدير شعبة ضمان الجودة والأداء الجامعي: د. بسام عبدالصاحب الهلالي

التاريخ

مصادقة السيد العميد

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1. Mission & Vision Statement

Vision Statement

The Department of Laser Technologies and Electro-Optics Engineering at Al-Furat Al-Awsat Technical University - Engineering Technical College of Najaf seeks to be a major tributary in preparing highly qualified specialized persons in engineering laser and electro-optical technologies, which will cover wide spectrum of work in the industrial, engineering and medical fields in the public sectors and private.

Mission Statement

1. Graduated qualified engineers in the fields of lasers and optoelectronics who have the ability to design, analyze and find appropriate solutions to practical problems and deal with advanced technology with high skill.

2. Preparing qualified graduates to participate in postgraduate studies inside and outside Iraq, and to work in research centers.

3. Engage in preparing practical research in the field of lasers and electro-optics to solve practical problems and contribute to community service.

4. Active participation in community development, upgrading the organization of conferences and seminars, as well as continuing education in the field of technical engineering, and adopting a methodology for continuous improvement in all activities.

2. Program Specification

Programd code:		**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

The laser and optoelectronics are a wonderfully wide-ranging subject. The emphasis of the program is the whole construction and repairing to which everything and anything at several different related fields. The degree is popular - for some it's the breadth of the subject that appeals, for others it's a path to specialization. All students have the opportunity to transfer onto our specialist degrees in whole branches of laser and opto-electronics technical engineering at the end of the first year.

Level 1 exposes students to the fundamentals of laser and opto-electronics, suitable for progression to all programs within the laser program group. Program-specific core topics are covered at Level 2 preparing for research-led subject specialist modules at Levels 3 and 4. Laser and opto-electronics graduate is therefore trained to appreciate how research informs teaching, according to the University and School Mission statements.

At Levels 2, 3 and 4 students are free to choose more than half of their module credits with the proviso a range of modules are selected that reflect the complexity of life forms. This allows students to develop their own wide-ranging interests in laser. Decisions on what to study are made with input from personal tutors.

The research ethos is developed and fostered from the start via practical's, which are either embedded in lecture modules or taught in dedicated practical modules, research seminars and tutorials. There is a compulsory field course in Level 1, which students must pass in order to progress into Level 2, and optional field courses in Levels 2, 3 and 4. At Level 4 all students carry out an independent research project, which may be a xx credit library or data analysis project, or a xx credit field or laboratory based project.

Academic tutorials are held at Levels 1 and 2 with the same tutor, who is also the personal tutor, providing continuity and progressive guidance. Level 1 and 2 tutorials include a number of workshops to teach skills, e.g. library use and presentation skills, followed by assessed exercises, e.g. essays and talks, as opportunities to practice these skills in a subject-specific context.

International years and Industrial placements are also offered and individual needs are discussed with the appropriate tutor and accommodated wherever possible.

3. Program Goals

1. Graduated qualified engineers in the fields of lasers and optoelectronics who have the ability to design, analyze and find appropriate solutions to practical problems and deal with advanced technology with high skill.

2. Preparing qualified graduates to participate in postgraduate studies inside and outside Iraq, and to work in research centers.

3. Engage in preparing practical research in the field of lasers and electro-optics to solve practical problems and contribute to community service.

4. Active participation in community development, upgrading the organization of conferences and seminars, as well as continuing education in the field of technical engineering, and adopting a methodology for continuous improvement in all activities.

4. Student Learning Outcomes

Laser and Opto-Electronics is the study of several applications such as industrial such as (cutting, welding, drilling, annealing etc.) of wide range of materials and alloys, military, and medical and so on applications. The Department offers a Bachelor of Science laser and opto-electronics with a concentration in general laser; Surveying / Design of pavements. Additionally, the Department offers courses to a large number of students from other departments and supports pre-professional programs. The building & construction curriculum and experiences are designed to prepare students, in part, for entry into professional structural programs, graduate studies, technical careers, and education.

5. Academic Staff

Academic staff of the department

	Name	Certificate	Scientific degree	Email	Mobile Number
1	Abdullah Ali Qasim	Ph.D.	Lecturer	alzubydea@atu.edu.iq	07901165670
2	Husam Noman MohammedAli	Ph.D.	Lecturer	Coj.husm@atu.edu.iq	07811216669
3	Nahla Ali Tuma	MSc	A.L.	nahla.ali@atu.edu.iq	07506401320
4	Nasr Nomas Hussain	Ph.D.	Lecturer	nasrnomas@atu.edu.iq	07827986677
5	Sara Jafar A. Razaq	MSc	Lecturer	sara.torki@atu.edu.iq	07804288591

6. Credits, Grading and GPA

Credits

ATU is following the Bologna Process with the European Credit Transfer System (ECTS) credit system.

The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Grade Point Average (GPA)

1. The GPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   GPA of a 4-year B.Sc. degrees:

   GPA = [(1st module score x ECTS) + (2nd module score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU15011	English Language	18	32	2	B	NO
ATU15012	Calculus	123	27	6	B	NO
ATU15013	Computer fundamentals and programming	93	7	4	S	NO
ATU15014	Engineering physics	93	7	4	S	NO
ATU15015	Electrical Circuits DC	153	47	8	C	NO
ATU15016	Laser principles	123	24	6	C	NO
TOTAL		603	147	30		

Semester 2 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU15021	Fundamental of Mathematics	123	127	6	B	NO
ATU15022	Digital Fundamentals and Logics	115	35	6	C	NO
ATU15023	Electrical Circuits AC	143	57	8	C	NO
ATU15024	Laser Physics	115	35	6	C	NO
ATU15025	Democracy & Human Rights	17	8	1	B	NO
ATU15026	WORKSHOP	73	2	3		
Total		586	164	30.00		

Semester 3 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU15031	Computer Programming Language	93	7	4	S	NO
ATU15032	Application of Mathematics	123	27	6	B	NO
ATU15033	Electronics	123	27	6	C	NO
ATU15034	static Electromagnetic Fields	63	37	4	C	NO
ATU15035	Probability Theory	63	37	4	S	NO
ATU15036	Optics	123	27	6	C	NO
Total		588	162	30		

Semester 4 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU15041	Advanced Mathematics	123	27	6	B	NO
ATU15042	Dynamic Electromagnetic Fields	63	37	4	C	NO
ATU15043	Electronics applications	123	27	6	C	NO
ATU15044	Digital Technique	123	27	6	C	NO
ATU15045	Laser Detection Systems	63	37	4	C	NO
ATU15046	Signals and Systems	63	37	4	S	
Total		558	192	30.00		

Semester 5 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU15051	Digital Applications	138	12	6	C	NO
ATU15052	Advanced Electronic Applications	123	27	6	C	NO
ATU15053	Optoelectronics	63	37	4	C	NO
ATU15054	Engineering Analysis	63	37	4	S	NO
ATU15055	Communication Theory	123	27	6	S	NO
ATU15055	Quantum Mechanics	63	37	4	C	NO
Total		573	177	30.00		

Semester 6 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU15061	Communication Circuits & Networks	123	27	6	S	NO
ATU15062	Control Theory	63	37	4	C	NO
ATU15063	Wave Propagation	63	37	4	C	NO
ATU15064	Numerical Analysis	123	27	6	S	NO
ATU15065	Spectroscopy	63	37	4	C	NO
ATU15066	Laser Applications	123	27	6		
Total		558	192	30.00		

Semester 7 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU15071	Graduation project	63	12	3	S	NO
ATU15072	Optical Fibers	123	27	6	C	NO
ATU15073	Advanced Control Engineering	123	27	6	C	NO
ATU15074	Digital Signal & Image Processing	123	27	6	C	NO
ATU15075	Professional Ethics	33	17	2	B	NO
ATU15076	Laser Design Technology	108	67	7	C	NO
Total		573	177	30.0		

Semester 8 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU15081	Graduation project	63	12	3	S	NO
ATU15082	High power Laser Techniques	123	27	6	C	NO
ATU15083	Optical system & Signal Processing	123	27	6	C	NO
ATU15084	Plasma & Gas discharge	63	37	4	C	NO
ATU15085	Computer Interface & Networks	123	27	6	C	NO
ATU15086	Photonics	78	47	5	C	NO
Total		573	177	30.0		

Total for all Semesters		4612	1388	240.0		

8. Contact

Program Manager:

1. Husam Noman Mohammed Ali | Ph.D. in laser sciences | Lecturer

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ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي