

**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 Description Guide**

**2024**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** 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:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have 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 sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** 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 / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

## Academic Program Description Form

**University Name:** University of Technology

**Faculty/Institute:** Laser and Optoelectronics Engineering

**Scientific Department:** Laser and Optoelectronics Engineering

**Academic or Professional Program Name:** Laser Engineering

**Final Certificate Name:** B.Sc. in Laser Engineering

**Academic System:** 1<sup>st</sup> Year Modular Mode.      2<sup>nd</sup> to 4<sup>th</sup> Courses Mode

**Description Preparation Date:** April 23, 2024

**File Completion Date:** April 23, 2024

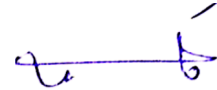
**Signature:**



**Head of Department:** Asst. Prof. Ali Abdulkhai

**Date:** 30/03/2024

**Signature:**



**Scientific Associate:** Prof. Makram A. F.

**Date:** 30/03/2024

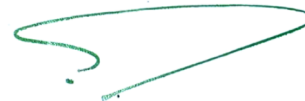
**The file is checked by:**

**Department of Quality Assurance and University Performance**

**Director of the Quality Assurance and University Performance Department:**

**Date:**

**Signature:**



**Approval of the Dean**

## 1. Program Vision

Be one of the leading engineering colleges in both the academic and research in the region to contribute to the development of local and regional community.

## 2. Program Mission

The mission of the Laser engineering program is to spread awareness of using this emerging technology amongst the scientists, the engineers and the entrepreneurs, educate undergraduate and postgraduate majors with the concepts and knowledge of the laser discipline, conduct high quality of scientific researches, interactive with community and involvement in the field of development of country industry and engineering institutions in the field of advanced laser.

## 3. Program Objectives

Our LE program will prepare students so they fully attain these characteristics within a few years of graduation, acknowledging that learning does not stop with the department and our program prepares each student for the changing workplace environment. The LE program has three main objectives:

- Objective 1: Successfully practice the Laser engineering disciplines,
- Objective 2: Building up rapid manpower in this technology through encouraging collaborative activities by offering courses of different durations to the engineers from the industries (PG), and UG students of the universities.
- Objective 3: Engage in life-long learning to advance professionally through continuing education and training,
- Objective 4: Carrying out research program for development of laser systems, subassemblies, and process design.

## 4. Program Accreditation

No

## 5. Other external influences

No

6. Program Structure				
Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	9	22 Units (30 H)	12.7%	
College Requirements	N/A			
Department Requirements	52	150 Units (197 H)	87.2%	
Summer Training	2 months except senior year (4th year)			
Other	N/A			

\* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Year 1 / Semester 1	LOEC111	Electrical Circuits I	4	2
Year 1 / Semester 1	LOEC112	Eng. Physics	2	3
Year 1 / Semester 1	LOEC113	Math I	2	
Year 1 / Semester 1	LOEC114	Chemistry	2	
Year 1 / Semester 1	WSHE106	Workshops		6
Year 1 / Semester 1	ENLA	English Lang. I	2	
Year 1 / Semester 1	LOEC117	Democracy	2	
Year 1 / Semester 2	LOEC121	Eng. Drawing	1	2
Year 1 / Semester 2	LOEC122	Math II	2	
Year 1 / Semester 2	LOEC123	Medical Physics	2	2
Year 1 / Semester 2	LCOSC108	Computer	1	2
Year 1 / Semester 2	LOEC125	Eng. Mechanics	4	
Year 1 / Semester 2	LOEC126	Electrical Circuits II	2	2
Year 1 / Semester 2	WSHE106	Workshops		6
Year 2 / Semester 1	LOPC211	Mathematics III	3	
Year 2 / Semester 1	LOPC212	Laser Principles	2	
Year 2 / Semester 1	LOPC213	AC Electrical Analysis I	2	
Year 2 / Semester 1	LOPC214	Electronics I	2	

Year 2 / Semester 1	LOPC215	Geometrical Optics	3	
Year 2 / Semester 1	LE216	Thermo – Fluids	2	
Year 2 / Semester 1	LOPCL211	Computer Applications		2
Year 2 / Semester 1	LOPCL212	Laboratories		
Year 2 / Semester 2	LOPC221	AC Electrical Analysis II	2	
Year 2 / Semester 2	LE222	Laser Physics I	2	
Year 2 / Semester 2	LOPC223	Electromagnetic Fields	4	
Year 2 / Semester 2	LOPC224	Probability and Statistics	4	
Year 2 / Semester 2	LE225	Heat Transfer	2	
Year 2 / Semester 2	LE226	Light Matter Interaction	3	
Year 2 / Semester 2	LOPCL221	Laboratories		3
Year 3 / Semester 1	LOPC311	Engineering Analysis I	2	
Year 3 / Semester 1	LOC312	Signals and Systems	2	
Year 3 / Semester 1	LE313	Power Electronics	2	
Year 3 / Semester 1	LE314	Laser Physics II	2	
Year 3 / Semester 1	LOPC315	Quantum Mechanics	4	
Year 3 / Semester 1	LEL311	Laboratories		3
Year 3 / Semester 2	LOPC321	Engineering Analysis II	2	
Year 3 / Semester 2	LOPC322	Communication Systems	2	
Year 3 / Semester 2	LE323	Control Engineering	4	
Year 3 / Semester 2	LE324	Spectroscopy	2	
Year 3 / Semester 2	LEL321	Group Project		4
Year 3 / Semester 2	LOPCL325	Semiconductor Devices	2	
Year 3 / Semester 2	LEL322	Laboratories		3
Year 4 / Semester 1	LOPC411	Optical Communications	4	
Year 4 / Semester 1	LOC412	Optoelectronics Eng.	4	
Year 4 / Semester 1	LE413	Laser System Design I	2	
Year 4 / Semester 1	LE414	Digital Electronics	2	
Year 4 / Semester 1	LE415	Laser Med. & Sci. App.	2	
Year 4 / Semester 1	LEL411	Laboratories		3
Year 4 / Semester 2	LE421	Laser Industrial App.	2	
Year 4 / Semester 2	LE422	Laser System Design II	2	
Year 4 / Semester 2	LOPCL421	Final Year Project		4
Year 4 / Semester 2	LE423	Gas Lasers	4	
Year 4 / Semester 2	LOPC424	Microprocessor Archit.	2	



Year 4 / Semester 2	LE425	Semiconductor Lasers	2	
Year 4 / Semester 2	LEL422	Laboratories		3

<b>8. Expected learning outcomes of the program</b>	
<b>Knowledge</b>	
Learning Outcomes 1	Apply mathematical and scientific concepts to analyze and solve engineering problems.
Learning Outcomes 2	Understand the core theories and principles in their specific engineering discipline
Learning Outcomes 3	Demonstrate a comprehensive understanding of fundamental principles in mathematics, physics, and other relevant sciences.
<b>Skills</b>	
Learning Outcomes 2	Technical Competence: Students should demonstrate proficiency in the application of scientific and mathematical principles to analyze and solve engineering problems. This includes understanding core concepts in their chosen engineering discipline and being able to apply them effectively.
Learning Outcomes 3	Communication Skills: Effective communication is essential for engineers to convey ideas, plans, and results to colleagues, clients, and other stakeholders. This includes written, oral, and visual communication skills, as well as the ability to collaborate effectively in interdisciplinary teams.
Learning Outcomes 4	Design Abilities: Students should be capable of designing systems, components, or processes to meet specific requirements while considering factors such as functionality, safety, sustainability, and cost-effectiveness. Design projects often emphasize creativity, innovation, and practical implementation.
<b>Ethics</b>	
Learning Outcomes 5	Engineering education emphasizes the importance of ethical conduct, integrity, and social responsibility.
Learning Outcomes 6	Students should understand the ethical implications of their work, adhere to professional codes of conduct, and consider the broader societal impacts of engineering projects.

## 9. Teaching and Learning Strategies

1. Lecture – based teaching: Traditional lecture–based instruction is often utilized in LOPE department, where lecturers deliver course content through lectures to large groups of students.
2. Interactive – teaching methods: To enhance student engagement and learning outcomes. This may include discussions, group activities, role–plays, and hands–on demonstrations to encourage active participation and deeper understanding of the subject matter.
3. Practical training and laboratories: Hands–on experiments, laboratory sessions, and summer training to provide students with opportunities to apply theoretical knowledge, develop technical skills, and gain practical experience in their field of study.
4. Final year projects: Contribute to knowledge creation and dissemination.

## 10. Evaluation methods

Assessment methods in LOPE department typically include a mix of examinations, quizzes, assignments, presentations, and practical assessments, mid–term, and final year exams. There is a growing emphasis on providing timely and constructive feedback to students to help them identify areas for improvement and enhance their learning experience.

## 11. Faculty

### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Dr. Abdullah K. Abbas	LE	Optical Comm.			Yes	
Dr. Razi J. Shugaith	Math	Informatics			Yes	
Dr. Mohammed Mijbil	LE	Remote Sensing			Yes	
Dr. Kadhum A. Hubeater	Physics	Materials			Yes	

Dr. Mohammed J Abdulrazzaq	LE	Solid State Lasers			Yes	
Dr. Suad M. Kadhum	Physics	Thin Films			Yes	
Dr. Ali H. Abdulhadi	LE	Communications			Yes	
Dr. Shams B. Ali	Physics	Thin Films			Yes	
Dr. Hiba Hassan	LE	Laser Eng			Yes	
Dr. Esraa K. Hamed	LE	Laser Eng			Yes	
Dr. Marwa S. Muhsin	Physics	Lasers			Yes	
Dr. Kareem Hussien	Physics	Laser Applications			Yes	
Dr. Aseel Abdulameer	LE	Laser Eng			Yes	
Dr. Faaiz Whaeb	Law	Law			Yes	
Mr. Mustafa Mehdi	Applied Science	Applied Physics			Yes	
Mr. Akram Shaker	Phsyics	Laser			Yes	
Mrs. Ruaa Shakir	LE	Laser Applications			Yes	
Mrs. May Abdulkareem	LE	Laser Applications			Yes	
Mrs. Zahra Mahmood	Applied Math	Applied Math			Yes	
Mrs. Anwar Sabah	Electrical and Electronics	Electronics			Yes	
Miss. Elaf Ayad	LE	Laser Eng			Yes	
Miss. Maryam Kareem	Math	Math			Yes	
Miss. Hanan Ismail	Laser Physics	Laser Physics			Yes	
Miss. Duaa Hmood	Biology	Biology			Yes	

## **Professional Development**

### **Mentoring new faculty members**

1. Begin by clarifying the roles, responsibilities, and expectations for the new faculty member. Provide them with a detailed overview of the department's mission, goals, and policies, as well as their specific duties, teaching assignments, and research expectations.
2. Pair the new faculty member with an experienced mentor who can offer guidance, support, and advice throughout their transition period. The mentor should be someone who is knowledgeable about the department, understands the academic culture, and is willing to invest time and effort into the mentoring relationship.
3. Assist new faculty members in developing their teaching skills and strategies. Provide guidance on course design, syllabus development, assessment methods, and classroom management techniques. Encourage them to observe experienced faculty members teaching classes and offer constructive feedback.
4. Support new faculty members in establishing their research agenda and securing funding for their projects. Connect them with potential collaborators, research mentors, and interdisciplinary research centers within the university. Encourage them to attend conferences, publish papers, and engage in scholarly activities.

### **Professional development of faculty members**

1. Encourage to participate in workshops, seminars, and training sessions on topics relevant to teaching, research, and professional growth. These sessions could cover areas such as pedagogy, instructional design, assessment methods, research methodologies, grant writing, academic publishing, and career advancement.
2. Provide funding or grants to support faculty members' research activities in scholarly journals. Participating in academic conferences allows faculty members to stay updated on the latest research trends, network with peers, and present their own work to a wider audience.
3. Offer assistance and resources to support faculty members' research endeavours. This could include access to research facilities, laboratories, equipment, and software, as well as assistance with literature reviews, data analysis, and grant proposal writing. Provide training on research ethics, compliance, and regulatory requirements

## 12. Acceptance Criterion

Central admission controls for the Ministry of Higher Education and Scientific Research for graduates of preparatory school and top institutes

## 13. The most important sources of information about the program

<https://uotechnology.edu.iq/index.php/>

## 14. Program Development Plan

The process of planning and development is carried out through feedback by the Council of Experts and the Scientific Curriculum Committees. The Expert Committee for the Laboratories Committees and in proportion to the requirements of the Ministry

Program Skills Outline												
				Required program Learning outcomes								
Year/Level	Course Code	Course Name	Basic or optional	Knowledge			Skills				Ethics	
				A1	A2	A3	B1	B2	B3	C1	C2	
Year 1	LOEC111	Electrical Circuits I	Basic	X	X	X		X				
	LOEC112	Eng. Physics	Basic	X	X	X						
	LOEC113	Math I	Basic	X								
	LOEC114	Chemistry	Basic		X							
	WSHE106	Workshops	Basic			X		X				
	ENLA108	English Lang. I	Basic					X				
	LOEC117	Democracy	Basic					X				
	LOEC121	Eng. Drawing	Basic			X	X					
	LOEC122	Math II	Basic	X								
	LOEC123	Medical Physics	Basic	X	X	X						
	LCOSC108	Computer	Basic									
	LOEC125	Eng. Mechanics	Basic	X	X							

	LOEC126	Electrical Circuits II	Basic	X			X	X			
	WSHE106	Workshops	Basic				X				
<b>Year 2</b>	LOPC211	Mathematics III	Basic	X							
	LOPC212	Laser Principles	Basic	X	X	X		X			
	LOPC213	AC Electrical Analysis I	Basic			X	X	X			
	LOPC214	Electronics I	Basic			X	X	X			
	LOPC215	Geometrical Optics	Basic	X	X	X					
	LE216	Thermo – Fluids	Basic	X	X						
	LOPCL211	Computer Applications	Basic					X			
	LOPCL212	Laboratories	Basic			X	X	X			
	LOPC221	AC Electrical Analysis II	Basic			X	X	X			
	LE222	Laser Physics I	Basic	X	X						
	LOPC223	Electromagnetic Fields	Basic	X	X						
	LOPC224	Probability and Statistics	Basic	X							
	LE225	Heat Transfer	Basic	X	X						
	LE226	Light Matter Interaction	Basic	X	X						
	LOPCL221	Laboratories	Basic			X	X	X			

<b>Year 3</b>	LOPC311	Engineering Analysis I	Basic	X							
	LOC312	Signals and Systems	Basic	X							
	LE313	Power Electronics	Basic			X	X	X			
	LE314	Laser Physics II	Basic	X	X						
	LOPC315	Quantum Mechanics	Basic	X	X						
	LEL311	Laboratories	Basic			X	X	X			
	LOPC321	Engineering Analysis II	Basic	X							
	LOPC322	Communication Systems	Basic						X		
	LE323	Control Engineering	Basic								
	LE324	Spectroscopy	Basic	X	X						
	LEL321	Group Project	Basic				X	X		X	X
<b>Year 4</b>	LOPC411	Optical Communications	Basic		X	X	X	X			
	LOC412	Optoelectronics Eng.	Basic		X						
	LE413	Laser System Design I				X	X	X	X		
	LE414	Digital Electronics	Basic			X	X	X			
	LE415	Laser Med. & Sci. App.	Basic			X	X	X			



	LEL411	Laboratories	Basic			X	X	X			
	LE421	Laser Industrial App.	Basic			X	X	X			
	LE422	Laser System Design II	Basic		X	X	X	X	X		
	LOPCL421	Final Year Project	Basic				X	X		X	X
	LE423	Gas Lasers	Basic		X						
	LOPC424	Microprocessor Archit.	Basic			X	X	X			
	LE425	Semiconductor Lasers	Basic		X						
	LEL422	Laboratories	Basic			X	X	X			

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

