

UNIVERSITY of TECHNOLOGY

الجامعة التكنولوجية



Bachelor of Science (B.Sc.) - Laser Science and
Technology

بكالوريوس علوم وتكنولوجيا الليزر



Table of Contents

1. Overview
2. Undergraduate Courses/Modules 2023-2024
3. Contact

1. Overview

This catalogue is about the courses (modules) given by the program of Laser Science and Technology to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج علوم وتكنولوجيا الليزر للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

1

Code	Course/Module Title	ECTS	Semester
MATH111	Mathematics	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	-	63	37
Description			
The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical			

thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

2

Code	Course/Module Title	ECTS	Semester
MESO112	Mechanics and Sounds	10	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	4	123	127
Description			
<p>The material of mechanics gives the student of laser physics scientific information and practical applications of modern concepts in physics. Classical mechanics play an important role in the study of some of the movement of objects and forces driven by laws the maintenance of momentum, energy and work and the laws of the movement of rotation and the installation of material and how to apply these concepts in our daily lives and the interpretation of some of the phenomena that occur, which provides the student the ability to address the behaviors that can appear during his time with future research.</p>			

3

Code	Course/Module Title	ECTS	Semester
ENDR113	Engineering Drawing	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
-	3	48	2
Description			
<p>Knowledge of engineering drawing principles and AutoCAD 2010 software. Learning the theoretical basic in the engineering shape drawing and executing by AutoCAD 2010 software. Learning the practical basic in applying of the engineering shape drawing by</p>			

AutoCAD 2010 software on the computers. Learning the ingredient and parts of AutoCAD 2010 software such as tools, modifying, scales, etc. and employing in the engineering shapes drawing. Learning of use different systems which applying in the AutoCAD 2010 software. Learning of execute the engineering draws with required dimensions and scales precisely.

4

Code	Course/Module Title	ECTS	Semester
GECH114	General chemistry	10	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	172
Description			
<p>Introducing the student to the scientific principles of science theories. to develop problem-solving skills and understanding of general chemistry through the application of techniques. This course deals with the basic concept of general chemistry. This is the basic subject for all chemistry phenomena subject. teaching the student how to process to obtain results that are consistent with practical results. Introducing the student to how to build scientific theories in chemistry.</p>			

5

Code	Course/Module Title	ECTS	Semester
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HURI115	Human Rights	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	17
Description			
<p>Developing and flourishing the human personality in its emotional, intellectual and social dimensions, and rooting in its sense of dignity, freedom, equality, social justice and democratic practice. Enhancing people's awareness - women and men - of their rights in a way that helps enable them to transform the principles of human rights into a social, economic, cultural and political reality, and raise their ability to defend, maintain and advance them at all levels. Strengthening the bonds of friendship and solidarity among peoples, enhancing respect for the rights of others, preserving cultural pluralism and diversity, flourishing national cultures for all groups and peoples, enriching the culture of dialogue and mutual tolerance, rejecting violence and terrorism, promoting non-violence and combating intolerance, and providing all people with strong immunity against hate speech. Promoting a culture of peace based on justice and respect for human rights, foremost of which is the right to self-determination, the right to resist occupation, and the democratization of international relations and the institutions of the international community, so as to reflect the common interests of humanity.</p>			

6

Code	Course/Module Title	ECTS	Semester
WORSH11	Workshops	2	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
-	3	45	5
Description			
<p>Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. Enable the student to know and understand work systems, risks, and the factors surrounding them. Enable the student to know and understand theoretical principles in handicrafts</p>			

and measurements.

7

Code	Course/Module Title	ECTS	Semester
LAPR121	Laser Principle	7	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	63	112
Description			
<p>This module gives an introduction to the working principle of laser. It explains the properties of the laser light and laser generation mechanisms.</p>			

8

Code	Course/Module Title	ECTS	Semester
ELMA122	Electricity and Magnetism	9	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
4	4	123	102
Description			
<p>The course provides students of laser science and technology with scientific information and practical applications of modern concepts in physics. Electricity and magnetism play an important role in the study of electric charges, the electric and magnetic field, electric and magnetic forces and their laws, Coulombs law and Causs law, how to apply these concepts in our daily lives, and the interpretation of some phenomena that occur, which provides the student with the ability to address behaviors that can appear during his time with future research.</p>			

9

Code	Course/Module Title	ECTS	Semester
COSC123	Computer Science	4	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	63	37
Description			
<p>Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and interactive tutorials.</p>			

10

Code	Course/Module Title	ECTS	Semester
ENLA124	English Language	2	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	-	33	17
Description			
<p>English is a course for first-class students depending on theoretical lectures. It is a comprehensive course that provides students with the fundamental principles of English. , some of the principles are illustrated with nature. In addition, it is focused on effective teaching and learning. The English course is specially adapted for the Middle East and North Africa. This course combines the best of English language teaching methodologies to help students use English accurately and fluently. It provides Basic</p>			

Concepts materials and their applications

11

Code	Course/Module Title	ECTS	Semester
LIGH125	Light	6	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	63	87
Description			
<p>The theory of light is a scientific explanation of how light behaves and interacts with matter. It is based on the understanding that light is an electromagnetic wave that travels through space at a constant speed of 299,792,458 meters per second (or approximately 186,282 miles per second). The theory of light explains that light can be reflected, refracted, absorbed, and transmitted by different materials. Reflection occurs when light bounces off a surface, while refraction occurs when light passes through a material and changes direction. Absorption occurs when a material absorbs some or all of the energy from the light, while transmission occurs when the material allows the light to pass through it.</p>			

12

Code	Course/Module Title	ECTS	Semester
WORSH11	Workshops	2	2

Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
-	3	45	5
Description			
<p>Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. Enable the student to know and understand work systems, risks, and the factors surrounding them. Enable the student to know and understand theoretical principles in handicrafts and measurements.</p>			