

TIKRIT UNIVERSITY

جامعة تكريت



Bachelor of Science – Sustainable Energy
Engineering

بكالوريوس علوم - هندسة الطاقة المستدامة



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1. Overview

This catalogue is about the courses (modules) given by the program of Sustainable Energy Engineering to earn the Bachelor of Science degree. The program delivers (48) Modules with (4500) 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 هندسة الطاقة المستدامة للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية مع (4500) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2025-2026

1

Code	Course/Module Title	ECTS	Semester
SE_ENG-101	Introduction to Sustainable Energy Engineering	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	87	63
Description			
This course will cover a range of energy sources and systems. The students will be introduced to some energy basics. The course also includes different energy sources and techniques, such as thermal and electrical solar energy systems, fuels and combustion, hydropower resources and turbines, wind energy, biofuels and biomass energy, and geothermal energy. The course also introduces energy storage.			

2

Code	Course/Module Title	ECTS	Semester
MATH-101	Calculus I	6	1
Lectures (hr/w)	Lab./Prac./Tutor(hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
4	2	87	63
Description			
This course is based on the principles of Euclidean, plane, and solid geometries. Students will be introduced to the basic postulates and theorems of geometry and encouraged to extend these ideas to the topics of similarity, circles, area, volume, and proof. In addition, students are involved in a more technological, theoretical, and algebraic approach to geometry.			

3

Code	Course/Module Title	ECTS	Semester
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SE_ENG-102	Physics	6	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
3	3	87	63
Description			
This course covers classical mechanics (kinematics, dynamics, work, energy, momentum), fluid mechanics, gravitation, and basic electrical and electronic principles including Ohm's law, diodes, and transistors.			

4

Code	Course/Module Title	ECTS	Semester
UOT-003	Computer Sciences	3	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
1	2	45	30
Description			
This course offers students a comprehensive exploration of the fundamental concepts and principles that underpin the field of computer science. By delving into various subjects including the historical development of computing, data representation, computer components, algorithms, programming languages, operating systems, applications, internet and networking, and cyber-security, students will develop a well-rounded understanding of the discipline. By examining the evolution of computer science over time, students will acquire a broad perspective on the field and its significance in contemporary society. Through a combination of theoretical knowledge and practical applications, this module equips students with the necessary foundation to pursue further studies or careers in computer science.			

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Code	Course/Module Title	ECTS	Semester
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ENG-106	Engineering Workshops	5	1
Lectures (hr/w)	Lab./<u>Prac.</u>/Tutor(hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
3	2	73	52
Description			
The engineering workshops course focuses on identifying risks in the work environment and industrial safety guidelines. And training on how to measure and determine, and the use of filing tools and their work. Learn about the types of wood used in carpentry, the process of shaping it, and the use of carpentry tools and machines. Training in welding work, its types, and the process of joining metals by welding. Training on various casting works and training on mechanical operation, which includes turning, milling, and grinding. Training on pipe knowledge, how to connect, sanitary engineering works, and training on the basics of electrical workshops.			

6

Code	Course/Module Title	ECTS	Semester
UOT-002	English Language I	2	1
Lectures (hr/w)	Lab./<u>Prac.</u>/Tutor(hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2		31	19
Description			
This course is designed to provide engineering students with the necessary oral and written skills required for effective communication in academic and workplace contexts, both with experts in their field and lay persons. It begins by introducing them to the principles of good academic practice, which are also presented as a model for ethical workplace practice, and thus help them to avoid issues such as plagiarism. The main part then leads on to developing research and summarizing skills that form the basis for the later activities. Students next learn to apply these skills to conducting technical presentations, as well as in group discussions that culminate in project planning activities.			

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Code	Course/Module Title	ECTS	Semester
UOT-004	Democracy and Human Rights	2	1
Lectures (hr/w)	Lab./Prac./Tutor(hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2		31	19
Description			
حقوق الانسان: هي حقوق يتمتع بها جميع مكونات البشر لمجرد اننا من ابناء البشر، وهذه الحقوق متأصلة في جميع البشر مهما كان عرقهم او جنسهم او قوميتهم او مذهبهم ولا تمنح من أي دولة، وتتضمن حقوق الانسان والطفل في الحضارات القديمة والاسلام، المواثيق الدولية، مصادر وضمانات حقوق الانسان، القوانين والدساتير، مجلس حقوق الانسان، العولمة، التقدم التكنولوجي وأثره على حقوق الانسان. الديمقراطية: يرجع مصطلح الديمقراطية الى الحضارة اليونانية القديمة وهي عبارة عن مصطلح مكون من مقطعين هما: (Cratia) التي تعني حكم و (Demo) التي تعني الشعب ليصبح المفهوم حكم الشعب ، وتتضمن الديمقراطية التطرق الى مفهومها ومعرفه الجذور التاريخية لها، المكونات، الخصائص، المميزات، الضمانات، علاقة الديمقراطية ب (الدستور، مؤسسات المجتمع المدني، حقوق الانسان، الحكم الرشيد، الانتخابات)، الديمقراطية المعاصرة.			

8

Code	Course/Module Title	ECTS	Semester
MATH-102	Calculus II	6	2
Lectures (hr/w)	Lab./Prac./Tutor(hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
4	2	87	63
Description			
This course is based on the principles of Euclidean, plane, and solid geometries. Students will be introduced to the basic postulates and theorems of geometry and encouraged to extend these ideas to the topics of similarity, circles, area, volume, and proof. In addition, students are involved in a more technological, theoretical, and algebraic approach to geometry.			

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Code	Course/Module Title	ECTS	Semester
SE_ENG-102	Engineering Mechanics	4	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
3	1	59	41
Description			
The course covers the following topics; statics of particles: forces in plane, forces in space, equilibrium, moment of a force, moment of a couple, equivalent systems of forces on rigid bodies, equilibrium in two dimensions, equilibrium in three dimensions, distributed forces: centroids and center of gravity, analysis of structures: trusses, frames and machines, internal forces in beams and cables, friction, moments of inertia of areas, moments of inertia of masses.			

10

Code	Course/Module Title	ECTS	Semester
SE_ENG-104	Basics of Electricity	5	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	3	73	52
Description			
The electrical engineering course focus on basic electrical elements and fundamentals of electrical quantities such as voltage, current, resistor and electrical power then to series, parallel and how to analyze the electrical circuits in Mesh, Nodal for DC and AC circuits as well as bridge circuits then move to Alternating current AC circuits and students will able to get knowledge to time dependent signals, average and RMS values. Capacitance and inductance. Elements in series and parallel. Kirchhoff's laws and Ohm's law. Introduction to Mesh, Nodal analysis, and superposition, Thevenin, Norton and maximum power transfer theorems for AC circuits.			

11

Code	Course/Module Title	ECTS	Semester
SE_ENG-205	Environment Pollution	5	2
Lectures (hr/w)	Lab./ <u>Prac.</u> /Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	3	73	52
Description			
This module offers a comprehensive foundation in environmental pollution, covering its nature, sources, and devastating impacts on natural ecosystems and human health. It focuses on the key aspects of air, water, and soil pollution, alongside thermal and sensory pollutants. The course emphasizes the crucial role of sustainable development and green energy in mitigating environmental degradation, while developing students' practical skills in environmental sampling and laboratory analysis.			

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Code	Course/Module Title	ECTS	Semester
ENG-101	Engineering Drawing	3	2
Lectures (hr/w)	Lab./ <u>Prac.</u> /Tutor.	SSWL (hr/sem)	USSWL (hr/w)
1	2	45	30
Description			
An engineering drawing course focuses on usage of drawing instruments, lettering, construction of geometric shapes, etc. Student's study uses of dimensioning, shapes and angles or views of such drawings. Dimensions feature prominently, with focus on interpretation, importance and accurate reflection of dimensions in engineering drawing. Other areas of study in this course may include projected views and development of surfaces.			

13

Code	Course/Module Title	ECTS	Semester
SE_ENG-105	Chemistry	5	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	3	73	52
Description			
This course aims to establish fundamental knowledge of This subject covers techniques to understand the significance of chemistry and classification the material to physical and chemical properties. Understanding atomic structure and electron configuration, chemical bonding and molecular geometry. applying gas laws and the principles of thermodynamics. Analyzing chemical equilibrium and reaction kinetics. Understanding the basic concepts of hydrocarbons and their reactions.			

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Code	Course/Module Title	ECTS	Semester
UOT-001	Arabic Language I	2	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2		31	19
Description			
تهدف هذه المادة إلى تعريف الطلبة باللغة العربية بوصفها لسان العرب، ولغة سامية حية تميزت بنظام صوتي وصرفي ونحوي وتركيبى دقيق، وهي اللغة التي نزل بها القرآن الكريم ولا يفهم على وجهه الصحيح إلا من خلالها. ويركز المقرر على تنمية مهارات الطلبة الأساسية في القراءة السليمة، والكتابة الصحيحة، وضبط قواعد الإملاء وعلامات الترقيم، إلى جانب التذوق الأدبي للنصوص القرآنية والشعرية المختارة من التراث القديم والحديث. كما يسعى المقرر إلى ربط الطالب بهويته اللغوية والثقافية، وتمكينه من توظيف العربية في حياته الجامعية والمهنية على نحو فعال.			