

Al-Furat Al-Awsat Technical University

جامعة الفرات الاوسط التقنية



First Cycle – Bachelor's Degree (B.Sc.) - Electrical Engineering Techniques

بكالوريوس - تقنيات الهندسة كهربائية



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1. Overview

This catalogue is about the courses (modules) given by the program of Electrical Engineering techniques to gain the Bachelor of science in electrical engineering techniques 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 تقنيات الهندسة الكهربائية للحصول على درجة بكالوريوس علوم تقنيات الهندسة الكهربائية. يقدم البرنامج (48) مادة دراسية، مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
ATU23011	DC Electrical Circuits	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
This course explains how to analyze circuits that have direct current (DC) or voltage sources. This course introduces the fundamental concepts of electrical direct current (DC) circuits and the most common practice problems students face during studying. To make learning easier tips and tricks have been shared in each topic. It will help students to understand the techniques used in DC circuits in the simplest manner. Students of this course will learn how to solve electrical circuit problems with DC sources using different techniques such as KVL, KCL, Nodal Mesh Analysis. These techniques are the basics of any electrical circuit problem or electronic circuit problem.			

Module 2

Code	Course/Module Title	ECTS	Semester
ATU23012	Digital Technologies	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	6	72
Description			
This Course provides an Overview of Number Systems and Logic Gates in Digital Circuits. It give a general overview of the design of Logic Gates starting from the problem to truth table and after this obtaining a function relies to the combination of inputs. It provides for students the opportunity to design a circuit based on Gates. This course is basic to understand digital system. This Course includes following topics with Simple Animated Video Explanation. • Introduction to number system & terms related to it. (Terms - Bit, Byte, Nibble) • Convert the Number from the given Number System to the specified Number System. (Number systems - Decimal , Binary, Octal , Hexadecimal an their Conversions from one Number System to another (Integer and Fractional).) • Perform the given Binary Arithmetic Operation on the given Data. (Binary Arithmetic - Compliments - 1's and 2's, Addition, Subtraction, Multiplication and Division (up to 8 bit).			

Module 3

Code	Course/Module Title	ECTS	Semester
ATU23013	Engineering Drawing	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	4	63	62
Description			
This Introduction to engineering drawings and blueprints course is aimed at those who have little or no previous experience of working with engineering drawings and who are required to read, understand and interpret them as part of their role. Working with engineering drawings involves understanding and analyzing, making decisions, and processing data. The Introduction to engineering drawings and blueprints based on practical application of print interpretation. It will give you a better understanding of the view representation, dimensions, tolerances, and symbols used on prints.			

Module 4

Code	Course/Module Title	ECTS	Semester
ATU23014	Differential Mathematics	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
Topics selected from financial mathematics, matrix algebra, linear inequalities and linear programming, counting arguments, and statistics and probability. Recommendations: High school geometry and algebra. (Math 30 is not a prerequisite.) Engineering students are not permitted to take MATH 14 for credit. History of mathematics in Babylonian, Egyptian, Greek, and other ancient civilizations. Number systems and computational techniques; achievements in elementary algebra, geometry, and number theory; famous results, proofs and constructions. Emphasis on solving problems in the style and spirit of each culture. Engineering students are not permitted to take MATH 15 for credit. A mathematical treatment of the symmetries of wallpaper patterns. The main goal is to prove that the symmetries of these patterns fall into seventeen distinct types. In addition, students will learn to identify the symmetries of given patterns (with special emphasis on the periodic drawings of M.C. Escher) and to draw such patterns. Three lectures, one section. Recommendations: High school geometry. Engineering students are not permitted to take MATH 16 for credit. Introduction to mathematical methods for dealing with questions arising from social decision making. Topics vary but usually include ranking, determining the strength of, and choosing participants in multicandidate and two-candidate elections, and apportioning votes and rewards to candidates. Recommendations: High school algebra. Engineering students are not permitted to take MATH 19 for credit.			

Module 5

Code	Course/Module Title	ECTS	Semester
ATU23015	Engineering Workshops	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	4	63	62
Description			
Participants to this course Problem Solving & Decision Making Skills training course will receive a thorough training on the subjects covered by the seminar outline, with a combination of theory, practical examples, many exercises and application on issues from their own work environment. Besides a comprehensive training manual, participants will receive additional materials like process cards, work sheets, case descriptions, sample solutions, etc.			

Module 6

Code	Course/Module Title	ECTS	Semester
ATU23016	English Language (Beginner)	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
vocabulary to communicate information about yourself and others, how to form questions to request information of others, the correct pronunciation of English vowels, consonants and diphthongs, English pronouns, articles and determiners, basic sentence ...			

Module 7

Code	Course/Module Title	ECTS	Semester
ATU23021	Engineering Mechanics	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
his course familiarizes students with the principles of static equilibrium by applying Newton's laws of motion to solve engineering problems. Emphasis is placed on drawing free body diagrams and self-checking strategies. Topics include introduction to forces; 2D equilibrium of particles and rigid bodies; center of gravity and centroids; distributed loading and hydrostatics; friction; analysis of truss structures; and shear force and bending moment diagrams.			

Module 8

Code	Course/Module Title	ECTS	Semester
ATU23022	Human Rights and Democracy	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	48	102
Description			
Definition and historical development of human rights and democracy; concepts of democracy, freedom and equality, different democratic perceptions, democratic culture, democracy in school and family, democratic citizenship; rights and freedoms, children and women's rights, national and international regulations on human rights (Universal Declaration of Human Rights, European Convention on Human Rights, Convention on the Rights of the Child, etc.); basic problems in the field of human rights, human rights and democracy education			

Module 9

Code	Course/Module Title	ECTS	Semester
ATU23023	Arabic Language	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	77	125
Description			
This course addresses the four language skills of Speaking, Listening, Reading and Writing in an integrated fashion, with a focus on Speaking. I- Language Functions: greet others using several regional greetings and culture-specific expressions provide information about your nationality, occupation and place of stay talk about your family status and family members describe your plans and habitual actions in your daily life describe your state of being and how you feel ask for things you need invite people over introduce someone else, such as a friend, colleague, or family member engage in dialogue (Q&A) with others around the above listed topics II- Grammar Points: basic word structure and sentence structure dependent and independent pronoun patterns (dpp and ipp) verb conjugations in the present future tense singular and plural forms of nouns and adjectives masculine and feminine nouns and adjectives descriptive pattern function words (want, have, have been) adverbs of time and days of the week numbers and rules of counting negations III- Arabic Script: introduction to the rules of Arabic writing reading and writing of the 28 Arabic letters in isolated and connected forms at a Beg level			

Module 10

Code	Course/Module Title	ECTS	Semester
ATU23024	AC Electrical Circuits	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	47	125
Description			
This free online electrical engineering course will help you gain an understanding of how an AC circuit works and how it's applied in the real world. You will learn about the differences between AC and DC circuits, Phasors and root mean squared/root-mean-squared (RMS) values along with important key topics such as how to calculate the reactance and impedance of an AC circuit, and how to perform various calculations in AC circuits.			

Module 11

Code	Course/Module Title	ECTS	Semester
ATU23025	Integral Mathematics	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	62	125
Description			
This is an introductory course on Integral Calculus. It comprises of a total of 5 hours of videos and quizzes. This is perfect for secondary school students seeking a good primer on Integral Calculus. It is also great as a refresher for everyone else. However prior knowledge in Differential Calculus is a MUST before learning this topic. The course is arranged from the very basic introduction and progresses swiftly with increasing depth and complexity on the subject. It is recommended that the students do not skip any part of the lectures, or jump back and forth, because good understanding of the fundamental is important as you progress. Quizzes are included on 7 subtopics to strengthen your understanding and fluency on this topic. So it is advisable that you attempt all the questions. The course is delivered by an experienced teacher with five years of experience teaching students on a one to one basis. The instructor understands the difficulties that students normally face to become competent in mathematics. So words and examples were carefully chosen to ensure that everybody gets			

Module 12

Code	Course/Module Title	ECTS	Semester
ATU23026	Computer Principles	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	12	75
Description			
AP Computer Science Principles is an introductory college-level computing course that introduces students to the breadth of the field of computer science. Students learn to design and evaluate solutions and to apply computer science to solve problems through the development of algorithms and programs. They incorporate abstraction into programs and use data to discover new knowledge. Students also explain how computing innovations and computing systems—including the internet—work, explore their potential impacts, and contribute to a computing culture that is collaborative and ethical.			

Module 13

Code	Course/Module Title	ECTS	Semester
ATU23031	DC Generators	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	63	87
Description			
Electrical generators are standalone machines that provide electricity when power from the local grid is unavailable. These generators supply backup power to businesses and homes during power outages. Generators do not create electrical energy, but they convert mechanical or chemical energy into electrical energy. Based on the output, generators are classified into two types as AC generators and DC generators. In this article, we will be discussing DC generators in detail. You can check out our article on the AC generator to understand its working principle, construction and more.			

Module 14

Code	Course/Module Title	ECTS	Semester
ATU23032	Electronic Essentials	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			

Module 15

Code	Course/Module Title	ECTS	Semester
ATU23033	Electrical Circuit Analysis	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	87	47
Description			
This section includes a description of the module, 100-150 words			

Module 16

Code	Course/Module Title	ECTS	Semester
ATU23034	Sensors	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	48	77
Description			
This section includes a description of the module, 100-150 words			

Module 17

Code	Course/Module Title	ECTS	Semester
ATU23035	Applied Mathematics	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	63	62
Description			
This section includes a description of the module, 100-150 words			

Module 18

Code	Course/Module Title	ECTS	Semester
ATU23036	Computer Applications	3	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	63	12
Description			
This section includes a description of the module, 100-150 words			

Module 19

Code	Course/Module Title	ECTS	Semester
ATU23041	DC Motors	6	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
This section includes a description of the module, 100-150 words			

Module 20

Code	Course/Module Title	ECTS	Semester
ATU23042	Electronic Circuits	6	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
This section includes a description of the module, 100-150 words			

Module 21

Code	Course/Module Title	ECTS	Semester
ATU23043	Advanced Electrical Circuits Analysis	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 22

Code	Course/Module Title	ECTS	Semester
ATU23044	Instruments and Measurements	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 23

Code	Course/Module Title	ECTS	Semester
ATU23045	Engineering Analysis	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 24

Code	Course/Module Title	ECTS	Semester
ATU23046	English Language (Intermediate)	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
This section includes a description of the module, 100-150 words			

Module 25

Code	Course/Module Title	ECTS	Semester
ATU23051	Principles of Power Engineering	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 26

Code	Course/Module Title	ECTS	Semester
ATU23052	DC Power Conversions	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 27

Code	Course/Module Title	ECTS	Semester
ATU23053	Electrical Transformers and Induction Machines	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 28

Code	Course/Module Title	ECTS	Semester
ATU23054	Electromagnetic Fields	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 29

Code	Course/Module Title	ECTS	Semester
ATU23055	Microprocessor	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 30

Code	Course/Module Title	ECTS	Semester
ATU23056	Numerical Analysis	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 31

Code	Course/Module Title	ECTS	Semester
ATU23061	Advanced Power Engineering	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 32

Code	Course/Module Title	ECTS	Semester
ATU23062	AC Power Conversions	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 33

Code	Course/Module Title	ECTS	Semester
ATU23063	Synchronous and Special Machines	6	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	57
Description			
This section includes a description of the module, 100-150 words			

Module 34

Code	Course/Module Title	ECTS	Semester
ATU23064	Digital Controllers	6	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	57
Description			
This section includes a description of the module, 100-150 words			

Module 35

Code	Course/Module Title	ECTS	Semester
ATU23065	English Language (Advanced)	3	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	48	27
Description			
This section includes a description of the module, 100-150 words			

Module 36

Code	Course/Module Title	ECTS	Semester
ATU23066	Elective 1	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
This section includes a description of the module, 100-150 words			

Module 37

Code	Course/Module Title	ECTS	Semester
ATU23071	Transmission and Distribution Systems	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 38

Code	Course/Module Title	ECTS	Semester
ATU23072	Electric Machine Drives	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 39

Code	Course/Module Title	ECTS	Semester
ATU23073	Power Systems Analysis	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 40

Code	Course/Module Title	ECTS	Semester
ATU23074	Electric Power Generation Stations	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

Module 41

Code	Course/Module Title	ECTS	Semester
ATU23075	Control Systems Analysis	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	3232
Description			
This section includes a description of the module, 100-150 words			

Module 42

Code	Course/Module Title	ECTS	Semester
ATU23076	Project 1	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	5	93	
Description			
This section includes a description of the module, 100-150 words			

Module 43

Code	Course/Module Title	ECTS	Semester
ATU23081	Professional Ethics	3	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
This section includes a description of the module, 100-150 words			

Module 44

Code	Course/Module Title	ECTS	Semester
ATU23082	Power System Protection	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	57
Description			
This section includes a description of the module, 100-150 words			

Module 45

Code	Course/Module Title	ECTS	Semester
ATU23083	Stability of Power Systems	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	57
Description			
This section includes a description of the module, 100-150 words			

Module 46

Code	Course/Module Title	ECTS	Semester
ATU23084	High Voltage Techniques	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3		78	47
Description			
This section includes a description of the module, 100-150 words			

Module 47

Code	Course/Module Title	ECTS	Semester
ATU23085	Project 2	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	6	93	32
Description			
This section includes a description of the module, 100-150 words			

Module 48

Code	Course/Module Title	ECTS	Semester
ATU23086	Elective 2 Modeling and Simulation Modern Control Systems Sustainable Energy Industrial Management	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
This section includes a description of the module, 100-150 words			

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