

AlShaab University
جامعة الشعب



*First Cycle – Bachelor's Degree (B.Sc.) –
Communication Engineering*

بكالوريوس - هندسة اتصالات



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1. Overview

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

نظرة عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة الاتصالات للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (٤٠) مادة دراسية، على سبيل المثال، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
COME103	Digital techniques	7	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	82
Description			
Introduction to Digital Technique: Elements of digital logic, digital logic function. Systems of numbers: General number formula, Binary, Octal, Decimal & hexadecimal numbers. Number Base Conversions: Arithmetic operation in define number, complements, binary, codes, BCD, Ex-3, gray codes. Boolean Algebra: Basic definition, Boolean functions. Canonical & Standard Forms digital Logic Gates. Karanough Maps: AND OR & implementation, Combinational Logic circuit. Adders Arithmetic operation: Subtractions, half & full adders & subtracts, binary parallel adders. Codes Conversion: Even and odd party logic, decoders encoders compactor, multiplexes & Demultiplexrs. Sequential Logic: Flip Flops (RS, T, D, JK) Master salve FF. Counters and Shift Registers: Asynchronous, synchronous, up-down synchronous, counter applications, shift register, kinds of shift register and applications of shift register. Data Conversion Circuits: Digital to analog convertor, Digital to analog convertor specifications.			

Module 2

Code	Course/Module Title	ECTS	Semester
COME104	Electronic Physics	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)

4	1	78	72
Description			
<p>The atom models, wave nature of light, dual nature of matter, energy – band theory of metals, insulators and Semiconductors and explain the influence of excess minority carrier recombination of the performance of the devices.</p> <p>p-n junction in equilibrium, current-voltage characteristics, charge control decryption of a diode transition and diffusion capacitance, diode switching Times, diode models, small-signal model, and load line concept.</p> <p>the students will learn Rectifiers, zener diodes voltage regulators, clipping circuits, clamping circuits and wave form generation, Varactor diode, tunnel diode, photodiode and photovoltaic (solar)cell, Light Emitting diode, principle and operation of semiconductor laser, metal Electronic Palasisics semiconductor diode. On the last objective explain the waveform change of diode clipping and clamping circuits and the function of each one.</p>			

Module 3

Code	Course/Module Title	ECTS	Semester
COME101	Electrical Engineering Fundamentals I	8	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	4	124	76
Description			
<p>Basic Concepts: Systems of Units, Charge and Current, Voltage, Power and Energy, Free electrons, electric charge & types of electric materials, Definition of: electric current, electric current flowing through a conductor Definition of electric voltage Polarity of electric voltage across an element The difference between electric potentials and electric voltage Linear and non-linear elements: resistances, conductance, capacitances, and inductances. Definition of: Power and energy, Sources (Independent Source & Dependent Source)</p> <p>Electrical Resistance and Conductance, Types of Resistors. Basic Laws: Nodes, Branches, and Loops, Planar and Non-planar Circuits, Ohm's Law, Kirchoff's Laws.</p> <p>Circuit Transformations: Series Resistors and Voltage Division, Parallel Resistors and Current Division, Star-Delta Transformations, Source Transformations. Methods of Analysis: Mesh Analysis, Nodal Analysis. Circuit Theorems: Superposition, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer. Magnetic Circuits.</p>			

Module 4

Code	Course/Module Title	ECTS	Semester
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COME102	Electrical Engineering Fundamentals II	8	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	4	124	76
Description			
<p>Sinusoidal Alternating Current Fundamentals: Generation of Alternating Voltages and Currents, Equations of Alternating Voltages, and currents, Simple and Complex Waveforms, Basic terminologies, Root Mean Square (R.M.S.) Value, Average Value, Form Factor and Peak Factor Instantaneous value, Cycle, Time period, Frequency, Amplitude, Peak-to-peak value, Phase, Phase angle, Phase difference, Angular Frequency.</p> <p>capacitors, Series and Parallel Capacitors, Inductors, Series and Parallel Inductors, A.C. Through Resistance, Inductance and Capacitances Series A.C. circuits Parallel A.C. circuits: Vector or Phasor Method, Admittance Method (Y), Complex or Phasor Algebra. Circuit Transformations, Theorem and Analysis in AC Circuits: Series Combinations and Voltage Division, Parallel Combinations and Current Division, Y-Delta Transformations, Source Transformations, Ohm's Law, Kirchhoff's Laws, Mesh Analysis, Nodal Analysis, Superposition, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer, Frequency Response.</p>			

Module 5

Code	Course/Module Title	ECTS	Semester
COME105	C++ Programming	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	3	64	61
Description			
<p>Introduction to computers and Classification of programming languages, Introduction to problem solving, Computers and Programming Languages, The Main structure of C++ programs, Processing a C++ Program. Basics of a C++ Program, Data Types, Variables, Arithmetic Operators, Assignment and Input Statements.</p> <p>Input / Output, I/O Streams, Predefined Functions, Output Formatting, Control Structures I (Selection): Relational Operators, Logical Expressions, If/If...else, Block Statements, Switch Structures, Control Structures I (Repetition): While Looping, Do...while Looping, For Looping, Break and continue Statements, Preparatory week before the final Exam</p> <p>User-Defined Functions, User-defined simple data types and the string type, Arrays and strings (2D array of characters), Pointers, Classes, File Input/Output.</p>			

Module 6

Code	Course/Module Title	ECTS	Semester
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COME110	Computer Skills	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	3	64	36
Description			
<p>Overview of computers: basic components, applications. GUI operating systems: Microsoft Windows operating system. Microsoft Office Word: getting started with Word, editing a document and formatting text and paragraphs, adding tables and inserting graphic objects, controlling page appearance and proofing a document.</p> <p>Microsoft Office Excel: getting started with Excel, sorting, selecting and subtotaling data, formulas and functions, worksheet formatting and presentation. Microsoft Office PowerPoint: getting started with PowerPoint, developing a PowerPoint presentation, adding graphical elements to your presentation and modifying objects in your presentation, adding graphical elements, tables and charts to your presentation and modifying objects in your presentation, prepare to deliver your presentation.</p>			

Module 7

Code	Course/Module Title	ECTS	Semester
COME106	Engineering Drawing	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	3	48	52
Description			
<p>Introduction to Engineering Drawing and Drawing Instruments, Conventions, viewing of engineering drawing sheets, Method of Folding of printed Drawing sheet, Drawing board, T-square, Drafter. Set squares, Protector, Drawing Instrument Box (Compass, Dividers, Scale, and Diagonal Scales etc.), pencils of different grades, Drawing pins/ Clips.</p> <p>Lines, polygons, ellipse etc., Geometrical figures and blocks with dimension, transferring measurement from the given object to the free hand sketches., Solid objects, Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone with dimensions, Free hand drawing of hand tools and measuring tools, simple fasteners trade related sketches.</p> <p>Drawing of Geometrical figures, Dimensioning, Lettering & Numbering, Sizes and layout of drawing sheets, Method of presentation of Engineering Drawing, Symbolic representation – different symbols used in the trades, Projections.</p> <p>Sign and Symbols of Electrical, Electronics and related trades, Electrical earthing diagram – Drawing the schematic diagram of plate and pipe earthing. Maps, and Charts</p>			

Module 8

Code	Course/Module Title	ECTS	Semester
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COME107	Workshop Skills	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	3	48	27
Description			
<p>The industrial safety, Tools of instrument (such as vernier caliper), Micrometer as tool of measurement. The general idea about abrasion and its type. The tools and materials that are used in abrasion. General idea about some materials that can be used. In making files and their kinds. Milling. General concept and explaining the use of lathe. The ways of operating lathe. Turning tools and minerals are used in making them. Drilling and gearing. The angles of tools that are used in turnings. Maintenance of lathe. General idea about carpentry. Tools of measuring used in carpentry.</p>			

Module 9

Code	Course/Module Title	ECTS	Semester
UREQ100	English Language	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
<p>Headway's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. Part of Speech. Reading of Numerals and Simple Equations</p> <p>Part of Speech. Reading Numerals and Simple Equations. Exercises. Reading Passages: Properties of engineering materials. Grammar Points: How to make a question statement, Verb to be, Possessive adjectives The Present Tense. The present continuous Tense. The present perfect. The future Tense. Passive voice. Some prefixes used in scientific English. The Position of adjectives. The Position of adverbs. The relative pronouns (which) and (that). Joining sentences with conjunctions. Asking and giving directions, Adverbs, Adjective + noun Requests and offers, Irregular verbs. Notes on writing laboratory reports.</p> <p>'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the back of the book provides models for students to analyze and imitate.</p>			

Module 10

Code	Course/Module Title	ECTS	Semester
UREQ101	Human Rights and Democracy	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17

Description
<p>تعريف حقوق الانسان وحقوق الانسان في الحضارات القديمة, تعريف الحق وتعريف الانسان ومعرفة أهمية حقوق الانسان بالنسبة للإنسان والمجتمع أيضا دراسة حقوق الانسان في الحضارات كالحضارة المصرية والعراقية واليونانية والرومانية</p> <p>معرفة حقوق الانسان في الأديان السماوية واهمها الإسلام مصادر حقوق الانسان تتضمن (مصادر دولية كالإعلان العالمي لحقوق الانسان والعهدان الدوليان والمصادر الإقليمية التي تشمل الاتفاقيات الإقليمية كالاتفاقية الأوروبية والأمريكية والدستور) ضمانات حقوق الانسان (كالضمانات الدستورية والقانونية), الاتفاقيات الدولية والإقليمية لحقوق الانسان, الحريات العامة وانواعها والمقارنة فيما بينها. مستقبل حقوق الانسان والعولمة وحقوق الانسان.</p> <p>تعريف وتاريخ وأنواع الديمقراطية (دراسة تعريف ونشأة وتطور الديمقراطية مبادئها وانواعها كالديمقراطية المباشرة وغير المباشرة والنظام الرئاسي والبرلماني) تعريف الانتخاب وشروطه وأنواع النظم الانتخابية وتعريف المجلس النيابي. العلاقة بين الديمقراطية وحقوق الانسان.</p>

Module 11

Code	Course/Module Title	ECTS	Semester
COME108	Mathematics I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	1	78	72
Description			
<p>Preliminaries Cartesian coordinates, polar coordinates, slope of lines, angle of inclination. Functions, types of functions, graph of the functions, domain and range of functions. Review of trigonometric function: graph of trigonometric function, range and domain of trigonometric functions, identities. Limits and Continuity: Properties, limits involving infinity, continuity.</p> <p>Transcendental functions: Inverse function, graph of inverse function, Logarithmic and exponential functions, inverse trigonometric functions, hyperbolic functions, inverse hyperbolic functions.</p> <p>Derivatives: Definition, rules of derivative, Implicit differentiation, L hospital's rule, derivative of inverse functions</p> <p>Applications of derivatives: rate of change problems, Relative maximum and relative minimum, Curve sketching with 1st and 2nd derivative, Linearization, Mean value theorem, Initial value problem.</p> <p>Complex numbers: Basic definitions. The geometric representations of the complex numbers, argand diagram, Basic operations with complex numbers, Euler's Formula. Vectors: Introduction to vectors</p>			

Module 12

Code	Course/Module Title	ECTS	Semester
COME109	Mathematics II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	1	78	72

Description

Integration: Definition, antiderivative, definite and indefinite integral. Integration and transcendental functions: integration of trigonometric and inverse trigonometric functions, integration of exponential and logarithmic functions, Integration of hyperbolic and inverse hyperbolic functions.

Numerical integration: Introduction, trapezoidal rule and Simpson's rule. Methods of integration: Substitution method, integration by parts, Trigonometric substitution method, integration by partial fraction. Application of definite integrals: Area, Volume, Lengths of curves in the plane, Areas of surfaces of revolution, Center of mass, moment of inertia.

Area of polar coordinates: Definition, polar equation, relating polar and Cartesian coordinates, Graph in polar coordinates, applications using polar coordinate system. Matrix: definition, matrix algebra, Determinant of matrix, Grammer's rule, Inverse of matrix, Gauss Elimination Method.

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