

جمهورية العراق

Ministry of Higher Education and  
Scientific Research

Mayssan University

College of Engineering

Department of Electrical  
engineering

وزارة التعليم العالي و البحث  
العلمي

جامعة ميسان

كلية الهندسة

قسم الكهرباء

المناهج الدراسية ومفرداتها Curriculum & the unites لقسم الهندسة  
الكهربائية for electrical engineering department

وصف المنهج Course Description

Misan

University

جامعة ميسان

2018-2017

2007 - 1428

# Course Syllabi

يتكون المنهج في قسم الهندسة الكهربائية من أربع وثلاثين مادة سنوية موزعة على أربعة أعوام وتكون ما مجموعه ١٦٤ وحدة وكما هو موضح من خلال الجداول التالية:-

## Current Electrical Engineering Courses for first year

# First year

Code	Subject	Hours/Week						Units
		First Term			Second Term			
		Th.	Prac	Tut.	Th.	Prac	Tut.	
EEE101	English language	2	-	-	2	-	-	4
EEE102	Digital Techniques	2	1	-	2	1	-	5
EEE103	Engineering Drawing	-	3	-	-	3	-	3
EEE104	Computer Science	2	2	-	2	2	-	6
EEE105	Principle of Mechanical Eng.	2	2	1	2	2	1	5
EEE106	Mathematics (I)	3	-	1	3	-	1	6
EEE107	Electronics (I)	2	-	1	2	0	1	4
EEE108	Basics of Electrical Eng.	3	-	1	3	-	1	6
EEE109	Laboratories	-	3	-	-	3	-	3
Total		16	11	4	16	11	4	42

Total hours per week

First term	Second term
۳۱	۳۱

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College of Engineering – Department of Electrical Engineering

Class: First year

Subject: Digital Techniques

Theoretical: 2 hr/wk

Tutorial: 1 hr/wk

Practical: - hr/wk

EEE 102

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**1- Introduction to Digital Techniques: (6 hrs.)**

**2- Basic Definitions : (4 hrs.)**

**3- System of Numbers : (6 hrs.)**

General number formula: Binary, octal, decimal and hexadecimal numbers.

**4- Numbers Base Conversion: (6 hrs.)**

Arithmetic operations in different number system, complements, binary codes, BCD, Ex-3, Gray codes.

**5- Boolean Algebra: (6 hrs.)**

Basic definitions, basic theorem and properties, Boolean functions.

**6- Canonical and Standard forms Digital Logic Gates: (6 hrs.)**

**7- Karnaugh Maps: (6 hrs.)**

AND- OR implementation, don't care conditions.

**8- Adders Arithmetic Operations: (6 hrs.)**

Subtractions, half and full adders and subtractions, binary parallel adders.

**9- Code Conversion: (6 hrs.)**

Even and odd parity logic, decoders, encoders, comparators, multiplexers and DE multiplexers.

**10- Sequential Logic: (8 hrs.)**

Flip-flops (RS, T, D, JK, ...), master slave FF, counters, shift registers.

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Class: First year

Subject: Engineering Drawing

Theoretical: -hr/wk

Tutorial: -hr/wk

Practical: 3 hr/wk

EEE 103

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### **Course Description:**

This course teaches student the fundamentals of Engineering drawing, Lettering, Applied Geometry, Descriptive Geometry, Projection and free hand sketching, Missing view, Dimensions, Isometric Drawing, Section and sectional views

### **Recommended Textbook(s):**

1.Engineering Drawing and Graphic Technology,  
Thomas E. French, Charles J. Vierck, McGraw Hill.

2.Engineering Drawing, A.W. Bowndy, McGraw Hill.

### **Course Topics:**

- Introduction
- Graphic Instruments and Their Use
- Lettering
- Graphic Geometry
- Multi View Ortho Graphic Projection in First and Third Angle Projection
- Dimensions
- Third View
- Isometric Drawing and Sketching
- Oblique Drawing
- Section of Isometric Drawing Sectional View

### **Program and Course Outcomes:**

By the end of the course the student will be able to:

1. draw various sketches with engineering drawing fundamentals.
2. use Graphic Instruments.
3. Sketch with multi view ortho graphic projection in different angle projection.
4. Imagination Isometric drawing and sketching and applied it in section of isometric drawing.

**University of mayssan**

**College of Engineering – Department of Electrical Engineering**

**Class: First year**

**Subject: Computer Science**

**Theoretical: 2 hr/wk**

**Tutorial: -hr/wk**

**Practical: 2 hr/wk**

**EEE 104**

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**1- Introduction: (2 hrs)**

**2- Computer Software: (8 hrs)**

Software fundamentals, system control programs, system support programs, types of applications software, software evaluation and selection.

**3- MSDOS Operating System: (4 hrs)**

**4- Windows Operating System : (10 hrs)**

Introduction to desktop, using the mouse, my computer, closing max-min an open window, creating new folder, selecting folders, finding folders or files, copying and moving files and folders. How to start any program, shut down, formatting floppy disk, scandisk, arranging icon, run, help, etc.

**5- WinWord: (8 hrs)**

Describing of the opening screen components, title bar, menu bar, creating a new file, opening an existing file, the use of close, save, save as, page setup, print preview, print, edit, undo, typing, repeat typing, cut, copy, paste, clear, select all, find replace, go to, etc., view ( tool bars, header and footer, zoom), insert ( page number, symbol, footnote, picture, textbox, object), format (font, paragraph, bullets and numbering, borders and shading, columns), tools (spelling and grammar, language), table (insert table, insert rows, delete cells, split cells, select row, select column, table auto format, sort, formula).

**6- Excel : (10 hrs)**

How to start excel program, menu bar, tool bar, formula bar, worksheet, cell, creating new worksheet, open existing worksheets, clearing cells, saving your work, closing workspace, zoom, drag and drop, insert cells, delete cells, find, replace, auto sum, enter a formula manually, formatting work sheet, auto format, print, print preview, drawing charts.

**7- Power point: (8 hrs)**

Describing of its features and use, the functions of toolbars and menu items (file, edit, view, format, tools, slide show).

**8- Internet: (10 hrs)**

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Class: First year

Subject: Principles of Mechanical Eng.

Theoretical: 2 hr/wk

Tutorial: 1 hr/wk

Practical: 1 hr/wk

EEE 105

### **1- Static: (20 hrs)**

Force system, units system, parallelogram law, force+ components, resultant of coplanar forces, components of force in space, moment of a force, moment of coupler, equilibrium, free body diagram, coplanar system, analysis of trusses, friction, nature of friction, theory of friction, coefficient of friction, centroids and center of gravity, centroids of area, centroids determined by integration, moments of inertia, parallel axes theorem, 2<sup>nd</sup> moment of area by integration, radius of gyration, moment of inertia of composite area.

### **2- Dynamics: (15 hrs)**

Kinetics of particle, rectilinear motion, curvilinear motion, rectangular components of curvilinear motion, normal and tangential component of acceleration, kinetics, force, mass and acceleration, kinetic of particle Newtons 2<sup>nd</sup> law.

### **3- Thermodynamics: (15 hrs)**

Introduction, active and their specifications, work and heat in ideal gasses and steam 1<sup>st</sup> law of thermodynamics, practical law in steam and gasses, 2<sup>nd</sup> law of thermodynamics practical law in steam and gasses.

### **4- Strength of Materials: (10 hrs)**

Hook's law, tension and compression stress, thin-walled cylinders and spheres, combined stress (Mohr's circle) shear and normal stress, stress in beams (initial principal).

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College of Engineering – Department of Electrical Engineering

Class: First year

Subject: Mathematics (I)

Theoretical: 3 hr/wk

Tutorial: 1 hr/wk

Practical: - hr/wk

EEE 106

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### **1-Brief Review: (12 hrs)**

Trigonometry, analytic geometry, sets, relations, functions, (Algebraic and trigonometric), differentiation and integration.

### **2- Transcendental Functions: (9 hrs)**

Inverse trigonometric, natural logarithmic, exponential and power.

### **3- Applications of the Definite Integral: (9 hrs)**

Area between curves, volume of revolution, length of the curve, surface area of revolution.

### **4- Hyperbolic Functions: (9 hrs)**

Definition, properties, graphs, inverse hyperbolic, differentiation and integration.

### **5- Methods of Integration: (12 hrs)**

Trigonometric substitutions, quadratics, parallel fractions, integration by parts, further substitutions.

### **6- Approximation Integral: (6 hrs)**

Trapezoidal, Simpson

### **7- Vector Algebra: (6 hrs)**

Representation of vectors in space ( $\mathbf{i}$ ,  $\mathbf{j}$ ,  $\mathbf{k}$ ) unit vectors, scalar products, vector product.

### **8- Complex Numbers: (9 hrs)**

Invented number system, the Argand diagram, addition, subtraction, product, quotient, power and roots, De Moivre's theorem.

### **9- Polar Coordinates: (9 hrs)**

The polar coordinate system, graphs of polar equations, plane area in polar coordinates.

### **10- Matrices and Determinants: (9 hrs)**

Definitions, properties, inverse of a matrix, solution of equations (Cramer's rule)

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College of Engineering – Department of Electrical Engineering

Class: First year

Subject: Electronics (I)

Theoretical: 2 hr/wk

Tutorial: 1-hr/wk

Practical: - hr/wk

EEE107

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### **1- Energy Levels and Atomic Structures: (10 hrs)**

The atom, models, wave nature of light, dual nature of matter, wave function, energy band, theory of metals, insulators and semiconductors, crystal structure, ionic, covalent and metallic bonding, energy band of crystals, internal structure of material cells, packing miller indices, crystal planes and directions, braggs law and x-ray diffraction, electronic ballistics.

### **2- Electrical conduction in Metals: (6 hrs)**

Mobility and conductivity, energy distribution of electrons, Fermi level, work functions.

### **3- Semiconductors: (8 hrs)**

Semiconductors materials (Si, Ge and compound semiconductors), extrinsic semiconductors, Fermi-level in semi conductor, diffusion and carrier life time, Hall effect.

### **4- Semiconductor P-N junction: (13 hrs)**

P-N junction in equilibrium, current-voltage characteristics, charge-control description of a diode, transition and diffusion capacitances, diode switching times, diode models, small-signal model and load line concept, introduction to heterojunctions and double heterojunctions.

### **5- Diode Circuit Applications: (13 hrs)**

Rectifiers, zener diode voltage regulators, clipping circuits, clamping circuits and wave form generation.

### **6- Other Types of Semiconductor Diodes: (10 hrs)**

Varactor diode, tunnel diode, photodiode and photovoltaic (solar) cell, light emitting diode, principle and operation of semiconductor laser, metal electronic palasilics semiconductor diode.

University of mayssan

College of Engineering – Department of Electrical Engineering

Class: First year

Subject: Basics of Electrical Engineering

Theoretical: 3 hr/wk

Tutorial: 1 hr/wk

Practical: - hr/wk

EEE108

EEE 108

### **1- Basic Concepts and Units: (6 hrs)**

Modern electron theory, electric charge, movement of electrons and electric current, electric potential, potential difference and electromotive force, principles of Ohm's law, SI system of units, applications on work and power.

### **2- Analysis of DC Circuits: (26 hrs)**

Resistance and resistivity, effect of temperature on resistance, Kirchhoff's laws, series and parallel circuits, sources of energy, Maxwell's circulating current method, Nodal analysis, superposition theorem, delta/star and star/delta transposition, Thevenin's theorem, Norton's theorem, maximum power transfer theorem, Millman's theorem.

### **3- AC Circuits: (30 hrs)**

AC Terminology, generation of AC voltages, series and parallel AC circuit analysis, maximum power transfer, power factor correction.

### **4- Resonance: (4 hrs)**

Series resonance circuit, parallel resonant circuit, resonance in series-parallel RLC circuit.

### **5- Capacitors: (4 hrs)**

Charging and discharging of capacitors.

### **6- Magnetic Circuits: (20 hrs)**

Magnetic field, laws of magnetic forces, magnetic flux and flux density, force on current-carrying conductor, Faraday laws, Lenz's law, magnetizing force, relation between B and H, reluctance, Ohm's law for magnetic circuits, series and parallel magnetic circuits, self-inductance of long solenoid and uniform-wound toroid, mutual inductance, emf in two series-connected coils, hysteresis loop, eddy-current losses.