

Courses / College of Engineering / University of Mosul  
The first level for the academic year 2020-2021  
Engineering / Computer Department

First academic level (second semester)									
Notes	Course Code	prerequisite	Number of units	The number of working hours	Theoretical number of hours	Course Name		Requirement type (Compulsory-optional)	Requirement name
						In English	In the Arabic language		
	UOMC100	-	2	-	2	Arabic Language	اللغة العربية	<b>Mandatory</b>	<b>University requirements</b>
<b>The student chooses only one course ,the number of units required = 2 units</b>	-	-	2	-	2	Manufacturing Processes	عمليات التصنيع	<b>Optional</b>	
	-	-	2	-	2	Environmental Pollution	تلوث البيئة	<b>Optional</b>	
	-	-	2	-	2	Information Technology	تقنيات المعلومات	<b>Optional</b>	
	-	-	2	-	2	Electrical Establishments	تأسيسات كهربائية	<b>Optional</b>	
	-	-	2	-	2	Modeling of Building Materials	نمذجة معلومات البناء	<b>Optional</b>	
	ENGC122	<b>Calculus I</b>	3	-	3	Calculus II	رياضيات II	<b>Mandatory</b>	<b>college requirements</b>
	ENGC124	<b>Engineering drawing</b>	1	3	-	Auto CAD	رسم بالحاسبة	<b>Mandatory</b>	
	ELPD150	<b>Physics</b>	3	-	3	Electronic Physics & Devices	فيزياء الإلكترونيات ونبائتها	<b>Mandatory</b>	<b>Department requirements</b>
	ECAN151	<b>Electrical and logic lab1</b>	4	2	3	Electrical Circuits Analysis	تحليل الدوائر الكهربائية	<b>Mandatory</b>	
	DSDE152	<b>Digital logic</b>	3	1	3	Digital System Design	تصميم النظم الرقمية	<b>Mandatory</b>	
	COOP153	<b>computer</b>	3	2	2	C++ & Object Oriented Programing	البرمجة بلغة C++ والبرمجة بالكائنات الموجهة	<b>Mandatory</b>	
			<b>21</b>	<b>8</b>	<b>18</b>	Total hours and units of the second semester			

**University of Mosul**  
**College of Engineering**  
**Computer Engineering Dept.**



**Arabic Language(UOMC100)**

**Lab    Tutorial    Theory**

**2**

<b>Course Objectives:</b>	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
Introduction to the Arabic language: definition of language and speech, noun, verb and letter	1 - 2
Punctuation marks	3
Verb and its divisions	4 - 5
Common mistakes in the Arabic language	6 - 7
The number	8
Hamza writing rules	9 - 10
The taa tethered and the open taa	11 - 12
Definition of hair: vertical hair and free hair	13 - 14
Semester exam	15
<b>Text Books:</b>	



<b>Course Objectives:</b>	
<p>Manufacturing can be basically defined as an addition processes by which raw materials of low utility and value due to it' s inadequate material properties and poor or irregular size, shape and finishing are converted into high utility and valued products with definite dimensions, forms and finish imparting some functional ability. An introduction to the principle of the manufacturing processes, properties of materials, types of materials, types of manufacturing processes, general consideration of manufacturing, selection methods of production, casting processes and production offerrous metals in addition to workshop laboratory will be covered in this course.</p>	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
Processes of precise measurement / Engineering materials / physical properties. Workshop lab	1
I-T International Tolerance / Mechanical properties. Workshop lab.	2
Clearance fits /ferrous metals. Workshop lab.	3
Interference fits /High furnace for the production of cast iron. Workshop lab.	4
Sources of Error in measurement / production of steel (part 1). Workshop lab.	5
Geometric errors / production of steel (part 2). Workshop lab.	6
Metal cutting / production of non-ferrous metals. Workshop lab.	7
Cutting tool material /characterization of cutting tool / Die casting. Workshop lab.	8
Type of cutting tools / Type of chip formation /plastic forming of metals (Rolling ). Workshop lab.	9
Tool life ( T ) / plastic forming of metals ( Extrusion ). Workshop lab.	10
Tool life for max production /plastic forming of metals ( Drawing ). Workshop lab.	11

Tool life for min production cost / Welding (part 1 ) Workshop lab.	12
Reich ratio / Welding ( part 2 ). Workshop lab.	13
Tangential velocity for special cases / Welding ( part 3 ). Workshop lab.	14
Solve examples / Welding ( part 4 ).	15
<b>Text Books</b>	
<p>طرق التصنيع والعمليات : تأليف الدكتور احمد الخطيب والدكتور خالد ايوب مطبعة جامعة الموصل – دار الكتب للطباعة والنشر 1981</p> <p>1 - الوسيط في هندسة النتاج تأليف الدكتور حسين رجب السيد دار الراتب الجامعية – بيروت 1984</p> <p>2 – مبادئ عمليات النتاج تأليف الدكتور قحطان خلف الخزرجي والدكتور عادل محمود حسن مطبعة التعليم العالي الطبعة الثانية (- بغداد 1987)</p> <p>3- Manufacturing processes. B.H. Amsted, Philip F. Ostward &amp; Myron L. Begeman.-3 8 the Edition 2005, John Wily &amp; Sons</p>	



<b>Course Objectives:</b>	
Teaching the student everything related to environmental pollution: an introduction to the environment, environmental pollution and the factors that led to the deterioration of the environment, types of pollution (water pollution, air pollution, noise pollution, thermal pollution, water pollution, water sources and their properties, chemical and physical properties of water, water quality, pollution Surface water sources, groundwater pollution and its sources, water treatment for drinking purposes with a table of units and a brief explanation for each scheme of waste water treatment units, characteristics of waste water, treatment objective, scheme of waste water treatment units, treatment and disposal of waste water, treatment objective, scheme of waste water treatment units )	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
Introduction to the environment and environmental pollution, the factors that led to the deterioration of the environment, types of pollution (water pollution, air pollution, noise pollution, thermal pollution)	1
Water Pollution: Water sources and their properties, chemical properties and physical properties of water	2 - 3
Surface water pollution and its sources, groundwater pollution and its properties. first daily exam	4
Water treatment for drinking purposes with a table of units and a brief explanation of each unit. semester exam	5 - 6
Lakes, thermodynamic demonstration, nutrients	7 - 8
Pollution of the environment with solid waste: Introduction, sources and characteristics of solid waste, solid waste, solid waste collection, solid waste disposal methods	9 - 10
air pollution : Introduction to air pollution, its sources and effects, pollutant characteristics, air pollutant removal units	11 - 12
Noise Pollution: Introduction to noise pollution, its sources, how to calculate noise	13 - 14
heat pollution: Introduction to thermal pollution, sources of waste pollution, the impact of thermal emissions on the environment.	15
1- Environmental Engineering by: Gerard Kiely 2-Introduction to Environmental Engineering by: Mackenzie L. Gwonwell.	



**Course Objectives:**

Upon completion of the Information Technology course, students should be able to perform the following tasks:

- Select the appropriate computer components to build, repair, or upgrade personal computers.
- Explain how to correctly use tools and safely work in a lab.
- Install components to build, repair, or upgrade personal computers.
- Explain how to perform preventive maintenance and troubleshooting on personal computers.
- Install Windows operation systems.
- Perform management and maintenance of Windows operating systems.
- Configure computers to communicate on a network.
- Configure devices to connect to the Internet and Cloud services.
- Explain how to use, configure, and manage laptops and mobile devices.
- Install and share a printer to meet requirements
- Implement basic host, data, and network security.
- Troubleshoot advanced hardware and software problems

**Course Details:**

Article	Week
Introduction to the Personal Computer Hardware: Introduction to the function of the main components of Computer Hardware and their types.	1 - 2
PC Assembly To select and install the appropriate computer components to build, repair, or upgrade personal computers.	3
Preventive Maintenance and the Troubleshooting Process To explain how to perform preventive maintenance and troubleshooting on personal computers.	4
Windows Installation To perform installation of Microsoft Windows operating system.	5
Windows Configuration and Management. To perform configuration, management, maintenance, and troubleshooting of Microsoft Windows operating system.	6
Networking Concepts and Applied Networking To explain the operation of networks and configure devices to connect to LANs, the Internet, and Cloud services.	7 – 8
Laptops and Other Mobile Devices To explain how to configure, repair, upgrade, maintain	9 - 10

and troubleshoot laptops and other mobile devices.	
Printers To introduce the function of the components of printers, compare different types of printers, and install a typical printer device.	11
Security To implement basic host, data, and network security.	12
Review	13
<b>Text Books:</b>	
1. IT Essentials: PC Hardware and Software Companion Guide Cisco Networking Academy series Companion Guide Series, Cisco Press, 2013 2. 2. RAJARAMAN, V., Introduction to Information Technology, 3rd edition, 2018.	



<b>Course Objectives:</b>	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
Electrical installations, including: A - General rules for the prevention of electric shock. B - Types of electrical installations. C- Symbols and terminology of electrical installations. D- Conductors, insulators and semiconductors.	1 - 2
Study carrying electric power wires and cables to current	3
Study bearing circuit breakers.	4
An electrical establishment project for a house or a multi-storey building on an engineering drawing sheet with tables showing the type of wires, cables, circuit breakers and their bearing.	5 – 6
Learn how to connect different electrical points.	7
Learn how to fix potential faults that occur at different electrical points.	8
Electrical industrial establishments, including: A- Install the power meter with circuit breakers. B - Connecting a transformer between two lines (contactor). C- Temporary connection on the contactor. D- Connecting a transformer between several lines.	9 – 12
Electronic establishments include: A- Learn the different parts of electronic components and identify their values. B - The use of electric iron in welding electrical circuits. C- Getting to know electronic maps and how to convert them into an electronic device.	13 - 15
The work of a simple electronic device involving two students. (working project)	
<b>Text Books:</b>	





<b>Course Objectives:</b>	
Qualifying students to use Revit for constructing building projects efficiently including preparing quantity schedules, in order to improve their professional skills.	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
Getting start1-Start a new project. 2- User Interface. 3-Units. 4-snaps.: What is BIM... comparison between BIM and CAD..	1
Getting started II.. 1-Start a new project. 2- User Interface. 3-Units. 4-snaps.	2
- Walls, Types of walls, walls drawing methods.. – Setting levels of project.	3
Doors & windows: 1- Adding doors. 2-Adding windows. 3- working with families.	4
Datum Entities:1-Working with levels.2-Working with grids.3-working with reference planes	5
Roofs & Floors. 1- types of roofs. 2- Drawing floors.	6
Stairs & Ramps: 1- Types of stairs. 2- drawing stairs. 3- Drawing ramps. 4- Railing.	7
Ceiling: 1- Making section view. 2- making elevation view. 3- draw ceiling.	8
Term Exam I	9
Curtain walls: 1- types of curtain walls. 2- drawing mullions. 3- sweep & reveal walls. 4- stacked walls.	10
Annotation: 1- Dimension. 2- Text. 3- Legend. 4- Adding callouts.	11
Massing tools: 1- Model in place. 2- Extrusion, sweep, revolve, blend, swept blend, solid & void masses,	12
Rendering: 1- adding furniture. 2- adding lights. 3- materials. 4- render drawing . 5- walkthrough.	13
Schedules: 1- Quantity Schedule. 2- Sheet Template 3- plot drawings.	14-15
<b>Text Books:</b>	
Autodesk Revit 2018 online Help.	



<b>Course Objectives:</b>	
This subject provides students with the basic skills of calculus, which is the core of many mathematical disciplines such as optimization, financial mathematics, statistics, simulation, etc. This subject introduces students to the fundamental concepts and skills of calculus.	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
<b>Integration</b>	1 - 3
- Calculus and Area.	
- Formulas for Finite sums.	
- Definite Integrals.	
- The Fundamental Theorems of Integral Calculus.	
- Indefinite Integrals.	
- Calculus and Area.	
- Integration by Substitution –Running the Chain Rule Backward	
<b>Applications of Definite Integrals</b>	4 – 6
- Areas between Curves- Calculus and Area.	
- Volumes of Solids of Revolution-Disks and Washers	
- Cylindrical Shells-An Alternative to Washers.	
- Lengths of Curves in the Plane	
- Areas of Surfaces of Revolution.	
<b>The Calculus of Transcendental Function</b>	7-9
- Inverse Function and Their Derivatives.	
- Ln x ,ex , and Logarithmic Differentiation.	
- Indeterminate Forms and Hospital's Rule	
- Other Exponential and Logarithmic Function.	

- The Inverse Trigonometric Function.	
- Derivatives of Inverse Trigonometric Functions.	
<b>Techniques of Integration</b>	10 – 13
- Basic Integration Formulas.	
- Integration by Parts.	
- Trigonometric Integrals.	
- Trigonometric Substitutions.	
- Rational Functions and Partial Fractions.	
- Using Integral Tables.	
- Improper Integrals.	
<b>Plane Curves and Polar Coordinates</b>	14-15
<b>Text Books</b>	
1- Calculus by Thomas and Finny.	
2- Calculus and Analytic Geometry by Thomas and Finny	



<b>Course Objectives:</b>	
The objective of this course is to teach students the basic commands and tools necessary for professional 2D drawing, design and drafting using AutoCAD.	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
Introduction to computer drawing programs with the definition of AutoCAD	1
ORTHO , Line , Point :drawing commands Zoom, Ds, Limit :Drawing command settings Ellipse ,circle ,Arc	2
Xline , Ray , Mline , Pline,polygon :Completion of drawing commands , change commands : Erase, Oops Watch orders :Zoom, Regen	3
Jump on graphic properties (snap object/ )Track Polar Array , Stretch, Scale, Rotate, Move, Copy: change orders	4
,Chamfer ,Fillet ,Trim ,Extend :Completion of change orders Mirror ,Lengthen ,Offset	5
Filter point properties (Filter Point ),Jump on impact points(Track),. Color, Pan, Help, Fill , Donut , Solid :other orders,Use of font types	6
Two things related to drawing points : Divide, Measure,Changing the concept of dimensions in the file : units,, Distance , ID, Area, Dblist , List, Mass (Inquiry) Question orders,properties, Properties ,Quick Select, Status	7
Style, Text, DDEdit , Spell, : Find, MText Writing and writing commands,Filling enclosed spaces in 2D Fill with standard samples :Hatch Edit, Bhatch,clamps(GRIBS)	8
Insert drawings on dimensions QDIM , Dimstyle ,Dim : Dimensioning	9
Design center, ADCenter: (Design Center)	10
MInsert ,Insert , Block :(Blocks) Integrated template work	11
Mold arts commands 12 , XclipRefedit , Xattach , Xref :	12
Layers	13
Standard 3D holograms	14
Better visibility commands :Shademode , H	15
<b>Text Books:</b>	
AutoCAD, 2021	



<b>Course Objectives:</b>	
Study the basics of manufacturing devices.	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
PN-junction diode	1
Potential barrier, drift current	2
Depletion layer and capacitor, forward and reverse bias	3
Temperature effect on diode characteristics.	4
Exam	5
Types of diodes 1	6
Types of diodes 2	7
Diodes applications 1	8
Diodes applications 2	9
Transistors	10
PNP and NPN	11
Transistor currents	12
Biasing of transistors	13
Characteristic curves	14
Exam	15
<b>Text Books:</b>	
1. فيزياء الإلكترونيات، وكاع الجبوري 2. الخواص الكهربائية والمغناطيسية للمواد، وكاع الجبوري 3. Electronic Devices, Floyd 4. Material Science, Kakani	



<b>Course Objectives:</b>	
The basic objective of this course is to introduce students to the fundamental theory and mathematics for the analysis of Direct Current (DC) and Alternating Current (AC) electrical circuits.	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
Introduction: electrical materials, basic quantities [ch1]	1
Basic relation: Ohm's law, dependent & independent sources, series & parallel resistor circuits, Y Δ transformation.[ch2]	2
Kirchhoff's laws .[ch2]	3
AC signals. [ch8]	4
AC circuits: capacitance & inductance.[ch6,8]	5 – 6
Phasors. [ch8]	7
AC circuits analysis. [ch8,ch9]	8
Circuit theory: source transformation, superposition, Mesh analysis, Nodal analysis, Thevenin's & Norton's theorem, maximum power transfer [ch3,5,8,9]	9 – 11
Steady-State Power Analysis [ch10]	12
Transient circuits: RL, RC & RLC [ch7]	13
Resonant circuits. [ch11]	14
Three-phase circuits. [ch11]	15
<b>Text Books:</b>	
Text book: BASIC ENGINEERING CIRCUIT ANALYSIS 10th Ed by J. Irwin Co-text book: BASIC ENGINEERING CIRCUIT ANALYSIS 11th Ed by J. Irwin, and ENGINEERING CIRCUIT ANALYSIS Text book2:	



<b>Course Objectives:</b>	
Introduction to digital system design through modeling, synthesis, and simulation computer-aided design.	
<b>Course Details:</b>	
<b>Article</b>	<b>Week</b>
Introduction to Digital Systems Design	1
Implementing Logic Functions using MSI and Programmable Devices	2
Implementing Technology Trade-offs PLDs	3
Design and Analysis of MSI Digital Devices	4
SD, ASM Chart, Transition Map, Timing Diagram	5
Synchronous Sequential act, Mealy and Moore, implicit table, state reduction and assignment.	6 – 8
Synchronous design using PLD	9 – 10
Asynchronous cct. Fundamental mode and pulse mode. Design steps	11 – 13
Hazards	14 - 15
<b>Text Books:</b>	
Text book1: Modern digital design by Richard S. Sandige (McGraw-Hill1990)	
Text book2: –Introduction to Logic Design – Alan B. Marcovitz (McGraw-Hill Higher Education 2010).	

University of Mosul  
 College of Engineering  
 Computer Engineering Dept.



## C++ & Object Oriented Programming (COOP153)

<b>Lab</b>	<b>Tutorial</b>	<b>Theory</b>
<b>2</b>		<b>2</b>

### Course Objectives:

1. This course introduces students to C++ programming language. Students will be taught the fundamentals of object oriented programming.
2. Understanding the effort needed to successfully develop engineering-oriented software.

### Course Details:

Article	Week
Introduction	1
Basic program construction: Keywords, Identifiers, comments, variables, Assignment statements, Input and output Statements.	2
Selection statements: if, if-else, switch-case	3
Loop statements: for, while, do...while	4 - 5
Functions	6 - 7
Arrays and Vectors	8 - 9
Pointers	10
Introduction to Classes, and Objects	11 - 12
Classes: A Deeper look	13 - 14

### Text Books

- 1- C++ How to Program, 8/E, Paul Deitel& Harvey Deitel, ©2012
- 2- Object Oriented Programming in C++ by Robert Lafore, Techmedia Publication.2002.