

# MODULE DESCRIPTION OF COMPUTER PROGRAMMING I

وصف المادة الدراسية

برمجة الحاسوب I

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Computer Programming I</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEECI111		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	CIE	College	College of Electronics Engineering
Module Leader	Faris Salih Alghareb	e-mail	faris.alghareb@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Nariman Najeeb	e-mail	@uoninevah.edu.iq
Peer Reviewer Name	Dr. Majed Dherar	e-mail	majid.younus@uoninevah.edu.iq
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p><b>The module aims at delivering and achieving the following aspects:</b></p> <ol style="list-style-type: none"><li>1. Familiarity with a computer components (hardware and software)</li><li>2. Learning about computer and how technically the processor executes a program to develop new skills of computer programming.</li><li>3. Developing problem solving and coding skills through understanding how to model and code a given scenario.</li><li>4. Writing C code to solve challenges/problems in the most interactive possible way.</li><li>5. Understand how to generally define a coding programming and represent it in a visual concept through Flowchart, or through sequence of steps (Pseudo-code). Focusing on studying flowchart, Pseudo-code, and mainly programming with C language</li><li>6. Learning how to command computers to perform tasks using C language (programming/coding)</li><li>7. Understand the format specifiers in programming and know how to use them correctly in C programming.</li><li>8. Become familiar with the structured programming including the three main terms in programming (sequencing, condition, iteration)</li><li>9. Learn the conditional instructions (if and case statement) and know to coding them correctly.</li><li>10. Developing professional programming skills through optimizing the number of instructions (instruction count) required to code a possible scenario.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Understanding fundamentals of programming through gaining a solid understanding of the core concepts of programming, such as variables, data types, operators, control structures (sequencing, condition, and loops), and basic input/output operations.</li><li>2. Identify levels of programming and why compilation is required.</li><li>3. Familiarize the students to become capable of visualizing a problem through representing it either in a flowchart or a in sequence of related steps.</li><li>4. Specify and declare required variables associated with a coding problem.</li><li>5. Take inputs from keyboard and print outputs on terminal</li><li>6. Summarize the operators of C programming.</li><li>7. Developing skills in debugging C code, including identifying and fixing common programming errors such that logic errors, syntax errors, and runtime errors.</li><li>8. Familiarity with tools and development environments to become comfortable with development tools and environments commonly used in C programming, such as integrated development environments (IDEs), compilers, and debugging skills.</li><li>9. Gaining practical experience by working on programming exercises and projects, and spend time reading and understanding given C code to learn from real-world examples.</li><li>10. Building skills that lead to involving in team working to identify requirements in a sequence of steps and then coding the problem in a professional manner.</li></ol>

<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following: [82 hrs] <ul style="list-style-type: none"> <li>▪ Computer components (hardware and software) [2 hrs]</li> <li>▪ Level of computer programming languages [2 hrs]</li> <li>▪ Visualization via flowchart and Pseudocode [4 hrs]</li> <li>▪ Keywords, identifier, format specifier, and naming variables and constants [8 hrs]</li> <li>▪ Use standard libraries to take input and display output [8 hrs]</li> <li>▪ Operators in C programming [16 hrs]</li> <li>▪ Priorities in C programming [4 hrs]</li> <li>▪ Math functions [4 hrs]</li> <li>▪ Conditional operations [8 hrs]</li> <li>▪ Iterations (Loop operators) [16 hrs]</li> <li>▪ Review classes and problem solving [10 hrs]</li> </ul>
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### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The primary strategy being concentrated on is developing conceptual programming thinking, meanwhile refining and expanding their mathematical thinking skills. This will be achieved through classes, online lectures, interactive tutorials. Additionally, working on complex projects that challenge students' skills and require to apply advanced concepts. Such projects would help students exploring various aspects of C programming and gain hands-on experience in solving complex problems.
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### Student Workload (SWL)

#### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	88	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	15% (10)	3, 6, 12	LO #2, 4, 6, 7, 8, 11 and 13
	Assignments	1	5% (5)	12	LO #1, 2, 5, 7, 10, and 11
	Projects / Lab.	1	10% (10)	14	LO #1, 2, 5, 7, 10, and 11
	Onsite Assignments	2	10% (10)	13,9	LO # 2, 6, 7, 8, 11, and 13
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-8
	Final Exam	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week #	Material Covered
Week 1	Introduction to computer components and level of programming languages
Week 2	Flowchart and Pseudo-code
Week 3	Examples of different scenarios visualized in flowchart and itemized in steps
Week 4	Introduction to C programming: Declare variables and constants
Week 5	Take input and print output
Week 6	Assignment and increment and decrement operators
Week 7	Arithmetic, Logical, and Bitwise operators
Week 8	Standard math functions in math header <math.h>
Week 9	Mid-term Exam
Week 10	Priorities of operators in C programming
Week 11	Relational and conditional operators
Week 12	If statement versus switch case statement
Week 13	Examples of structured programming (sequencing and condition)
Week 14	Loop operators (For, while, do-while)
Week 15	Examples of structured programming (sequencing, condition, and iteration)
Week 16	Preparation week prior to the final Exam

# MODULE DESCRIPTION OF INFORMATION TECHNOLOGY

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Information Technology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CIE116		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronic Engineering
Module Leader	Heba Nabeel Yahya Al-Talb	e-mail	heba.yahya@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Mohamed Hazem	e-mail	mohammed.aljamas@uoninevah.edu.iq
Scientific Committee Approval Date	15/6/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. This course will introduce students to the fundamental concepts of Computer Science to improve students' ability to use the computer efficiently.</li><li>2. Impart students with an understanding of the basics of computer science, develop proficiency in the practice of computing, and prepare them for continued professional development.</li><li>3. The students will be able to describe a computer system's main components by identifying its name, purpose, and characteristics.</li><li>4. safe procedures and Tool use in Lab for Preventive Maintenance and Troubleshooting.</li><li>5. Understanding operating Systems fundamentals.</li><li>6. This course deals with the basic concept of Computer Networks Fundamentals.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>By the end of this course, students should be able to:</p> <ol style="list-style-type: none"><li>1. It is designed to give students a grounding in both the fundamentals of information technology and practical development skills. Through a combination of practical and theory-based learning, students develop a firm understanding of subjects from hardware and software concepts.</li><li>2. Describe the main components of a computer system by identifying the name, purpose, and characteristics of cases, motherboards, adapter cards, memory modules, central processing unit and cooling system, power supplies, internal components, internal cables, ports, and cables, input devices, and output devices.</li><li>3. Students will attain an ability to apply knowledge of computing. Understanding basic computer hardware architecture improves the student's ability in the hardware component of the personal computer, to solve problems that appear in the computer.</li><li>4. Introduction to the operating system and explain the purpose of it. Students will learn to use current techniques, skills, and tools necessary for computing practice, such as operating system user interfaces (Graphical user interface, and Command Line Interface).</li><li>5. Describe the role of Operating system and the of the operating system,</li></ol>

	<p>characteristics, mode of operating system.</p> <ol style="list-style-type: none"> <li>6. Students will attain an ability to work effectively in teams to accomplish a common goal.</li> <li>7. Provide an overview of network principles, and networking standards, purposed to meet the expectations and needs of network users, to be familiar with networking concepts.</li> <li>8. Physical component of a network.</li> <li>9. Describe a physical address(MAC) and logical address (IP) to communicate on the network.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Introduction to a computer system – Information technology and computer definitions, computer architecture, computer system characteristics with specific features and functions of cases, power supplies, internal components, internal cables, ports and cables, input devices, output devices, computer classification, and historical developments of computers. [10 hrs]</p> <p>Operating system definition and the role of the operating system, characteristics of the operating system, desktop operating system comparison with network operating, what is the minimum hardware requirements of different Microsoft operating systems, define file system and explain different file system characteristics. [8 hrs]</p> <p>Fundamental concepts of network definition, components and types of computer networks, purpose and characteristics of network, physical components of a network, cables, and mode of transmission, internet protocol addressing, Numerical number. [10 hrs]</p> <p>Class participation and discussion [2 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy will be to focus on developing a conceptual understanding of the fundamental principles of the main hardware components of computer systems, explaining the operating system concepts and roles of it, and overview of network principles, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive Labs, and by considering the type of simple experiments involving some interesting sampling activities for the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	60	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	15% (15)	5, 10, 12	LO #2, 4, 5, 7, 8 and 9
	<b>Assignments,</b>	2	6% (6)	6, 11	LO # 2, 4, 5, 7 and 9
	<b>Projects/ Lab. attendance</b>	1	15% (15)	Continuous	
	<b>Report</b>	1	4% (4)	12	LO # 2, 4, 7, 8, and 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hrs	10% (10)	8	LO # 1-5
	<b>Final Exam</b>	2hrs	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		



## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to computer science and information technology course.
<b>Week 2</b>	Computer architecture, historical development, computer classification, Definition of the basic Computer system components cases, power supplies.
<b>Week 3</b>	Describe Internal components characteristics (motherboards, CPU, Adaptor cards, Expansion slots).
<b>Week 4</b>	Describe Internal components characteristics (Memory modules, Storage drives).
<b>Week 5</b>	Internal cables, ports and its cable, common types of data, and power cables. Input devices, output devices.
<b>Week 6</b>	Operating System Fundamental, roles of the operating system, user interface (CLI, GUI), application management.
<b>Week 7</b>	Desktop operating system compared to network operating system.
<b>Week 8</b>	<b>Mid-term Exam</b>
<b>Week 9</b>	Applications Programming Interface (API), File systems, types of file systems.
<b>Week 10</b>	introduction to Hard disk drives, Solid State Drives.
<b>Week 11</b>	Networking Concepts. Principles of networking, computer network components, computer network Devices. Mode of transmission.
<b>Week 12</b>	Network Media, Types of Networks.
<b>Week 13</b>	Network equipment addressing, MAC address, and Internet Protocol (IP) address classes.
<b>Week 14</b>	Numerical number.
<b>Week 15</b>	Numerical number.
<b>Week 16</b>	<b>Final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1-2</b>	Lab 1: Introduction to Desktop computer hardware components.
<b>Week 3-4</b>	Lab 2: Computer connectivity with peripherals devices.
<b>Week 5-6</b>	Lab 3: Basics of personal computer assembly.
<b>Week 7-8</b>	Lab 4: Operating system user interface using Command User Interface (CLI).
<b>Week 9-10</b>	Lab 5: Microsoft Windows 10 user interface using Graphical User Interface (GUI).
<b>Week 11-12</b>	Lab 6: Microsoft Windows control panel utilities & settings.
<b>Week 13-14</b>	Lab 7: Introduction to Microsoft Office(power point).

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	"Complete CompTIA A+ Guide to IT Hardware and Software" SEVENTH EDITION, CHERYL A. SCHMIDT	(electronic reference) PDF available
<b>Recommended Texts</b>	Textbook: - IT Essentials "PC Hardware and Software Companion Guide" Third Edition, David Anfinson and Ken Quamme. - ITE Course " Version 6"	(electronic reference) PDF available
<b>Websites</b>		

## Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION OF MATHEMATICS I

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics I		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEE206		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronics Engineering
Module Leader	Ahmed A. Mohammed	e-mail	ahmed.mohammed@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Ahmed A. Mohammed	e-mail	ahmed.mohammed@uoninevah.edu.iq
Peer Reviewer Name	Dr. Sedki Thanoon	e-mail	sedki.thanoon@uoninevah.edu.iq
Scientific Committee Approval Date	16/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To develop problem solving skills.</li> <li>2. To use analytical methods to solve related problems.</li> <li>3. To understand the basics of linear algebra and its applications.</li> <li>4. To review previous knowledge of differentiation and gain new knowledge with new applications of differentiation.</li> <li>5. To understand logarithmic functions along with their properties, graphs, and derivatives.</li> <li>6. To tackle exponential functions along with their properties, graphs, and derivatives.</li> <li>7. Understanding further transcendental functions.</li> <li>8. The course primarily emphasizes basics of linear algebra and calculus.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To explore the concept of Linear Algebra.</li> <li>2. Perform matrix addition and multiplication, and identify special matrices.</li> <li>3. Define and understand the Rank of a Matrix.</li> <li>4. Describe a system of linear algebraic equations, and solving systems of equations with row operations and augmented matrix (Gaussian Elimination method, Gauss-Jordan elimination method).</li> <li>5. Finding the inverse of a 2X2 and 3X3 matrices, and using it to solve systems of equations.</li> <li>6. Understand the concept of trivial and non-trivial solutions.</li> <li>7. Find the matrix determinant.</li> <li>8. Apply the Cramer's rule to solve systems of equations.</li> <li>9. Define the Eigen Value and Eigen Vector Problem.</li> <li>10. Determine the Eigen values and vectors of a given Matrix.</li> <li>11. Apply differentiation techniques, also, discuss the implicit differentiation, and higher order differentiation, and applications of differentiation including maxima and minima, and curve plotting.</li> <li>12. To familiarize oneself with Transcendental functions (e.g., Exponential functions, Natural logarithm functions, Logarithmic function to an arbitrary base, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, and Inverse hyperbolic functions) along with their properties, and graphs.</li> <li>13. Compute derivatives of transcendental functions (e.g., Exponential functions, Natural logarithm functions, Logarithmic function to an arbitrary base, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, and Inverse hyperbolic functions).</li> <li>14. To become familiar with Vectors and Representation of vectors in space <math>(i;j;k)</math>, dot and cross products, vector functions, partial derivatives, directional derivative, Gradient, Del operator, Divergence and Curl.</li> </ol>
<p><b>Indicative Contents</b></p>	<p>Indicative content includes the following:</p>

المحتويات الإرشادية	<p>Basics of Linear Algebra: Matrices properties, special matrices, elementary row operations, and solving systems of equations using various techniques. [28 hrs.]</p> <p>Differentiation techniques, Chain rule, Implicit differentiation; Higher order differentiation; Applications of differentiation, maxima and minima; Curve plotting, Differentiation of trigonometric functions, etc. [8 hrs.]</p> <p>Transcendental functions (e.g., Exponential functions, Natural logarithm functions, Logarithmic function to an arbitrary base, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, and Inverse hyperbolic functions) along with their properties, and graphs. [8 hrs.]</p> <p>Differentiation of transcendental functions (e.g., Exponential functions, Natural logarithm functions, Logarithmic function to an arbitrary base, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, and Inverse hyperbolic functions). [8 hrs.]</p> <p>Vectors and Representation of vectors in space (i;j;k), dot and cross products, vector functions, partial derivatives, directional derivative, Gradient, Del operator, Divergence and Curl. [18 hrs.]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>The main strategy is to enhance the fundamental mathematical abilities of engineering students, which are essential for comprehending engineering disciplines efficiently. The topics covered in this course will serve as fundamental building blocks, enabling students to pursue specialized studies in various engineering and technological domains.</p>

## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	18% (18)	6, 9, 11	LO #1, 3, 4, 7, and 13
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 2, 5, 6 and 11
	<b>Onsite Assignments</b>	1	5% (5)	5	LO # 2, 5, 6 and 11
	<b>Report</b>	1	7% (7)	10	LO # 1-9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hrs	10% (10)	8	LO # 1-9
	<b>Final Exam</b>	2hrs	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	<b>Matrices:</b> - Matrix Algebra (Column and Row Vectors, Matrix Addition, Matrix Multiplication, Scalar Multiple of a Matrix, Transpose of a Matrix). - Rank of a Matrix. - Special Matrices.
<b>Week 2</b>	- Systems of Linear Algebraic equations. - Elementary Row Operations and Elimination methods. - Gaussian Elimination method. - Gauss-Jordan elimination method.
<b>Week 3</b>	- Linear Independence/Dependence. - Matrix Inverse. - Solving Systems of Linear Equations using Matrix Inverse.
<b>Week 4</b>	- Trivial and Non-trivial solutions.

	<ul style="list-style-type: none"> <li>- Determinants and their properties.</li> <li>- Cramer's rule.</li> </ul>
<b>Week 5</b>	- Eigen Values and Eigen Vectors.
<b>Week 6</b>	<b>Differentiation:</b> <ul style="list-style-type: none"> <li>- Tangents and the Derivative at a Point.</li> <li>- The Derivative as a Function.</li> <li>- Differentiation Rules.</li> <li>- The Derivative as a Rate of Change.</li> <li>- Derivatives of Trigonometric Functions.</li> </ul>
<b>Week 7</b>	Mid-term Exam
<b>Week 8</b>	<ul style="list-style-type: none"> <li>- The Chain Rule and Higher Order Derivatives.</li> <li>- Implicit Differentiation.</li> <li>- Concavity (Maxima and minima).</li> <li>- Curve sketching.</li> <li>- Indeterminate Forms and L'Hôpital's rule.</li> </ul>
<b>Week 9</b>	<b>Transcendental functions:</b> <ul style="list-style-type: none"> <li>- Exponential functions.</li> <li>- Logarithmic function to an arbitrary base.</li> <li>- Natural logarithm functions.</li> </ul>
<b>Week 10</b>	<ul style="list-style-type: none"> <li>- Inverse trigonometric functions.</li> <li>- Hyperbolic functions.</li> <li>- Inverse hyperbolic functions.</li> </ul>
<b>Week 11</b>	- Differentiation of Exponential, Logarithmic function to an arbitrary base, and Natural logarithm functions.
<b>Week 12</b>	- Differentiation of Inverse trigonometric functions, Hyperbolic and Inverse Hyperbolic functions.
<b>Week 13</b>	<b>Vectors:</b> <ul style="list-style-type: none"> <li>- Representation of vectors in 2D and in space (i;j;k).</li> <li>- Dot and cross products.</li> </ul>
<b>Week 14</b>	<ul style="list-style-type: none"> <li>- Vector functions.</li> <li>- Partial derivatives.</li> <li>- Directional derivative.</li> <li>- Gradient.</li> </ul>
<b>Week 15</b>	<ul style="list-style-type: none"> <li>- Del operator.</li> <li>- Divergence and Curl.</li> </ul>
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1-2</b>	
<b>Week 3-4</b>	
<b>Week 5-6</b>	

Week 7-8	
Week 9-10	
Week 11-12	
Week 13-14	

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas's Calculus 12 <sup>th</sup> edition	Yes
Recommended Texts	Advanced Engineering Mathematics 6 <sup>th</sup> edition by Dennis G. Zill	No
Websites		

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



# MODULE DESCRIPTION OF DC ELECTRIC CIRCUITS

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	DC Electric Circuits		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEE215		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronics Engineering
Module Leader	Omar Mowaffak Alsaydia	e-mail	omar.alsaydia@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Sara Ihsan	e-mail	sara.basheer@uoninevah.edu.iq
Peer Reviewer Name	Maan Aladwany	e-mail	maan.aladwany@uoninevah.edu.iq
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. To develop problem solving skills and understanding of circuit theory through the application of techniques.</li><li>2. To understand voltage, current, and power from a given circuit.</li><li>3. This course deals with the basic concept of electrical circuits.</li><li>4. This is the basic subject of all electrical and electronic circuits.</li><li>5. To understand Kirchoff's current and voltage Laws problems.</li><li>6. To perform mesh, Nodal analysis, and superposition theory.</li><li>7. Understanding of Thevenin's and Norton's theorems.</li><li>8. This course deals with the basic concept of RL and RC circuits.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Recognize how electricity works in electrical circuits.</li><li>2. List the various terms associated with electrical circuits.</li><li>3. Summarize what is meant by a basic electric circuit.</li><li>4. Describe electrical power, charge, and current.</li><li>5. Define Ohm's law.</li><li>6. Explain Series and parallel connection</li><li>7. Identify the basic circuit elements and their applications.</li><li>8. Discuss the various properties of resistors, capacitors, and inductors.</li><li>9. Explain the two Kirchoff's laws used in circuit analysis.</li><li>10. Apply Mesh and Nodal analysis for circuits analysis.</li><li>11. Apply superposition for circuit analysis.</li><li>12. Using Thevenin and Norton equivalent circuits for handy analysis techniques.</li><li>13. Explain the RL and RC circuits.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>DC circuits – Current and voltage definitions, and circuit elements, Combining resistive elements in series, parallel and Delta-Star Transformation. [18 hrs]</p> <p>Kirchoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis, Source transformation Thevenin and Norton theorem. [18 hrs]</p> <p>Inductor and Capacitor as Circuit Elements, RL and RC Circuits, Transient response [12 hrs]</p>

	Revision problem classes [8 hrs]
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	The main strategy will be to focus on developing a conceptual understanding of fundamental principles such as voltage, current, resistance, and circuit analysis techniques., while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering the type of simple experiments involving some interesting sampling activities for the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	88	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	10% (10)	6, 9, 11	LO #1, 3, 4, 7, and 13
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 2, 5, 6 and 11
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	10% (10)	13	LO # 5, and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-8
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to Circuit Theory
<b>Week 2</b>	Basics of Network Elements
<b>Week 3</b>	Resistance and Resistivity, Ohm's Law and Inductance, Capacitance
<b>Week 4</b>	Series and parallel Connection, Voltage and current Division
<b>Week 5</b>	Delta-Star Transformation
<b>Week 6</b>	Review of Kirchhoff's Laws
<b>Week 7</b>	Mesh Analysis
<b>Week 8</b>	Nodal Analysis
<b>Week 9</b>	Mid-term Exam + Source Transformations
<b>Week 10</b>	Superposition Theorem
<b>Week 11</b>	Thevenin and Norton Equivalent
<b>Week 12</b>	Review of Thevenin Equivalent
<b>Week 13</b>	Review of Inductor and Capacitor as Circuit Elements, RL and RC Circuits
<b>Week 14</b>	Analysis of RC-transient circuits
<b>Week 15</b>	Analysis of RL-transient circuits
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1-2</b>	Lab 1: Introduction to basic principles
<b>Week 3-4</b>	Lab 2: Ohm's law
<b>Week 5-6</b>	Lab 3: Kirchhoff's Laws
<b>Week 7-8</b>	Lab 4: Nodal Analysis
<b>Week 9-10</b>	Lab 5: Superposition Theorem
<b>Week 11-12</b>	Lab 6: Thevenin Theorem
<b>Week 13-14</b>	Lab 7: Transient Response

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Engineering Circuit Analysis: 8th edition, 2012 BY W. Hayt	Yes
<b>Recommended Texts</b>	Introductory Circuit Analysis: 10th edition, By R. L Boylestad	No
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Democracy and Human Rights</b>		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NV12		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	1
Administering Department	Dept. of Computer and Information	College	EE
Module Leader	Husham swadi hashim	e-mail	Husham.hashim@uoninevah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	PHD
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>1 - شرح مفهومي حقوق الانسان والديمقراطية</p> <p>2 - بيان اهمية حقوق الانسان في حياتنا العامة وعلى جميع الصعد ( الدراسية و الوظيفية و الاجتماعية .. الخ (</p> <p>3 - بيان اهمية ايجاد مفهوم واعي لمصطلح الديمقراطية ضمن انظمة الحكم وتأثيرها على الاستقرار السياسي</p> <p>4 - ضرورة فهم الترابط الوثيق ما بين حقوق وبنء مجتمع ديمقراطي يضمن حرية افرادة وضمان مصالحهم</p> <p>5- ضرورة التركيز على ان بناء مفهوم حقيقي لحقوق الانسان ومجتمع ديمقراطي لا يكون الا من خلال ين قوانين تضمن ذلك واهمية هذه القوانين في بناء مجتمع مستقر يضمن لجميع افرادة حقوقهم ضمن نظام سياسي ديمقراطي</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>1 - ترسيخ قيم الحرية والمساواة في اسس المشاركة الفعلية في بناء المجتمع</p> <p>2 - العمل على بناء بيءة حقيقية مستقرة من خلال تطبيق القوانين ضمن مجتمع ديمقراطي</p> <p>3 - والسعي لتوفير اسس لحماية الافراد ضمن المجتمعات الديمقراطية</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>القسم الأول:- التطور التاريخي لحقوق الإنسان - أولاً:- المجتمعات البدائية مرحلة ما قبل التاريخ - الحضارات الشرقية (بلاد وادي الرافدين والحضارة الفرعونية نموذجاً) - نموذجاً - الحضارات الغربية (اليونانية ) والرومانية ثانياً:- الشرائع السماوية الديانة اليهودية - الديانة المسيحية - الديانة الإسلامية(بصوره أكثر تفصيلاً) - ثالثاً:- تطور حقوق الانسان في القوانين الوضعية نظرية العقد الاجتماعي - الحروب العالمية وأثرها في حقوق الانسان - التنظيم الدولي - القسم الثاني :- حقوق الإنسان التعريف بها وأنواعها أولاً- التحديد والتعريف الحق في الفقه الإسلامي - الحق في الفقه القانوني - تعريف حقوق -</p>

الإنسان

ثانياً- تقسيمات حقوق الإنسان (وتتم بدراسة مفصلة ومقارنة بين القانون والشريعة الإسلامية)  
الحقوق الجماعية(حق تقرير المصير, حق التنمية, الحق في بيئة مناسبة, حق الإنسان في العيش بسلام)

-

الحقوق الفردية (الحقوق الاقتصادية والثقافية, الحقوق المدنية والسياسية الحقوق الصيغة بال شخصية)

-

القسم الثالث:- ضمانات احترام وحماية حقوق الإنسان

أولا - الضمانات في الشريعة الإسلامية

ثانياً:- الضمانات على الصعيد الوطني

ثالثاً:- الضمانات على الصعيد الدولي

مفردات ماده الديمقراطية

الكورس الأول:- يتضمن ماده الحريات العامة بين الشريعة والقانون

الكورس الثاني:- يتضمن ماده نظم إدارة الدولة بين الشريعة والقانون

الحريات العامة (بين الشريعة والقانون )

أولاً:- المقدمة

ثانياً:- التعريف بالحريات العامة

- الأصل اللغوي
- الأصل التاريخي
- الأساس القانوني
- الأساس الشرعي

ثالثاً:- أسس الحريات العامة

- العدالة
- المساواة
- الحرية

رابعاً:- الحريات العامة الوصفية

- حرية الرأي
- حرية الفكر
- حرية الأعلام
- المساواة

خامساً:- الشريعة الإسلامية والحريات العامة

- موقف الإسلام من المرأة (الميراث, الزواج, تولي الوظائف) -
- موقف الإسلام من حرية العقيدة -

نظم إدارة الدولة

أولاً:- في تحديد النظم السياسية

- فكره النظام السياسي
- شرعية النظم السياسية
- أنواع النظم السياسية

ثانياً:- في النظام الديمقراطي



	<p>مقدمة تأصيلية -  تعريف الديمقراطية -  أركان ومرتكزات النظام الديمقراطي -  ثالثاً: نماذج الديمقراطية  الديمقراطية المباشرة -</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	اتباع طريقة التعليم المباشر من خلال عرض المادة وشرحها والاستعانة بالادوات التعليمية لشرحها من خلال توضيح اليات المفهوم العلمي لمصطلحي الديمقراطية و حقوق الانسان

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	16	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	9	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	0.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	25		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	التطور التاريخي لحقوق الانسان
<b>Week 2</b>	الشرائع السماوية
<b>Week 3</b>	تطور حقوق الانسان في القوانين الوضعية
<b>Week 4</b>	حقوق الانسان التعريف بها وانواعها
<b>Week 5</b>	ضمانات احترام وحماية حقوق الانسان
<b>Week 6</b>	الضمانات في الشريعة وعلى الصعيدين الوطني والدولي
<b>Week 7</b>	Mid-term Exam
<b>Week 8</b>	مفهوم الديمقراطية
<b>Week 9</b>	الحريات العامة بين الشريعة والقانون
<b>Week 10</b>	التعريف بالحريات العامة و اسس الحريات
<b>Week 11</b>	الشريعة الاسلامية والحريات العامة
<b>Week 12</b>	نظم ادارة الدولة
<b>Week 13</b>	الديمقراطية مقدمة تأصيلية
<b>Week 14</b>	اركان ومرتكزات النظام الديمقراطي
<b>Week 15</b>	نماذج الديمقراطية
<b>Week 16</b>	Preparatory week before the final Exam

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	

Week 8	
Week 9	
Week 10	
Week 11	
Week 12	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		Yes
Recommended Texts		No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION OF COMPUTER PROGRAMMING II

وصف المادة الدراسية

برمجة الحاسوب II

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Programming II		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEECI121		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	2
Administering Department	CIE	College	College of Electronics Engineering
Module Leader	Faris Salih Alghareb	e-mail	faris.alghareb@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Nariman Najeeb	e-mail	@uoninevah.edu.iq
Peer Reviewer Name	Dr. Majed Dherar	e-mail	majid.younus@uoninevah.edu.iq
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEECI121	Semester	1
Co-requisites module		Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p><b>The module aims at delivering and achieving the following aspects:</b></p> <ol style="list-style-type: none"><li>1- Building a strong foundation in programming concepts</li><li>2- Learn code organization and readability (breaking down a program into smaller logical units to improve code readability and to make it easier to understand and maintain).</li><li>3- Understand how to create reusable user-defined functions that can be called whenever needed.</li><li>4- Learn how to encapsulate complex problems or tasks into Functions to provide a well-structured C code.</li><li>5- Learn how to enable communication between different parts of a program via passing of arguments (parameters) and return values.</li><li>6- Learn to program 1D and 2D arrays in C programming</li><li>7- Employ strings with 1D and 2D arrays</li><li>8- Reuse of code segments, leading to more efficient and concise programming.</li><li>9- Use built-in functions in headers (math.h , stdlib.h , string.h) for efficient programming.</li><li>10- Providing students with practical skills that are applicable in various real-world programming scenarios which involve the employment of functions with arrays.</li></ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Building algorithmic thinking to foster problem-solving skills in C programming Understanding the hierarchical level of programming and gaining a solid understanding of the core concepts of programming, such as functions, and Arrays, and Stings operations.</li><li>2. Mastering syntax and language features. Learn the syntax and language features of C programming, including how to write and structure C code correctly, use libraries, handle memory, and understand pointers and arrays.</li><li>3. Problem-Solving and algorithmic thinking through developing problem-solving skills and learn how to break down complex problems into smaller, more manageable tasks.</li><li>4. Learn to design and implement functions using C programming constructs.</li><li>5. Familiarity with Standard Library Functions to gain knowledge of the standard library functions available in C and how to use them effectively to perform common tasks, i.e., string manipulation, memory management, file I/O, and mathematical computations.</li><li>6. Building efficient and optimized code through exploring techniques for writing efficient and optimized code, such as optimizing algorithms for better runtime efficiency.</li><li>7. Understanding portability and interfacing via learning and gaining knowledge</li></ol>

	<p>of interfacing with other programming languages and libraries using techniques like calling external functions and using C APIs.</p> <p>These objectives provide a solid foundation for learning C programming and can highly assist students become proficient in developing coding skills of programming languages.</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following: [80 hrs]</p> <ul style="list-style-type: none"> <li>▪ Standard libraries versus user-defined library functions [2 hrs]</li> <li>▪ Function definition [4 hrs]</li> <li>▪ Passing arguments to function [8 hrs]</li> <li>▪ Function prototype [4 hrs]</li> <li>▪ Recursive function [4 hrs]</li> <li>▪ Arrays (1D and 2D) [16 hrs]</li> <li>▪ Functions with arrays [8 hrs]</li> <li>▪ String: 1D and 2D array of strings [4 hrs]</li> <li>▪ String functions [4 hrs]</li> <li>▪ Pointer [8 hrs]</li> <li>▪ File (read/write) [8 hrs]</li> <li>▪ Review classes and problem solving [10 hrs]</li> </ul>

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<p>The primary strategy being concentrated on is developing conceptual programming thinking, meanwhile refining and expanding their mathematical thinking skills. This will be achieved through classes, online lectures, interactive tutorials. Additionally, working on complex projects that challenge students' skills and require to apply advanced concepts. Such projects would help students exploring various aspects of C programming and gain hands-on experience in solving complex problems.</p>
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### Student Workload (SWL)

#### الحمل الدراسي للطالب

<p><b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل</p>	88	<p><b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً</p>	6
<p><b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل</p>	62	<p><b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً</p>	4.4
<p><b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل</p>	150		

## Module Evaluation

تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	3, 6, 12	LO #2, 4, 6, 7, 8, 11 and 13
	Assignments	3	10% (10)	4, 8, 12	LO #1, 2, 5, 7, 10, and 11
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 2, 6, 7, 8, 11, and 13
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-8
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week #	Material Covered
Week 1	Introduction to the types of functions: user-defined and standard library functions
Week 2	Structure of Program with Functions, describing the hierarchical abstraction levels of function call
Week 3	User-defined function: function prototype, function call, and function definition.
Week 4	Passing arguments (parameters) to a function
Week 5	Example of building user-defined functions for various selected problems.
Week 6	Recursive function, recursion versus loop structure for speed performance comparison
Week 7	Arrays: One dimension and two dimensions (1D and 2D): how to initialize and index array elements
Week 8	Example of solve complex problem of 1D array properties such that sorting array elements (ascending or descending).
Week 9	Mid-term Exam
Week 10	2D arrays: defining, initialization, and indexing elements. Examples: Solving complex problem of 2D array properties such that manipulating primary diagonal vs secondary diagonal, swapping elements between rows, and find min/max values among 2D array elements.
Week 11	Functions with arrays
Week 12	Global variables versus local variables
Week 13	Strings: 1D Array, 2D Array, and String functions
Week 14	Pointers in C programming
Week 15	Files and structure in C programming

<b>Week 16</b>	<b>Preparation week prior to the final Exam</b>
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<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
<b>Week#</b>	<b>Material Covered</b>
<b>Week 1-2</b>	Lab 1: Introduction to user-defined functions
<b>Week 3-4</b>	Lab 2: Passing parameters to functions and Recursive function.
<b>Week 5-6</b>	Lab 3: Arrays (1D and 2D)
<b>Week 7-8</b>	Lab 4: functions with arrays
<b>Week 9-10</b>	Lab 5: String 1D/2D arrays
<b>Week 11-12</b>	Lab 6: Pointers
<b>Week 13-14</b>	Lab 7: Files and structure (read from and write to files)

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	C Programming Absolute Beginner's Guide, 3rd Edition 2014. BY: Greg Perry and Dean Miller.	No
<b>Recommended Texts</b>	C How to Program with an introduction to C++" 8 <sup>th</sup> Edition 2016. BY: Paul Deitel and Harvey Deitel. Global Edition contribution by Piyali Sengupta	No
<b>Websites</b>	1- <a href="https://www.programiz.com/c-programming">https://www.programiz.com/c-programming</a> 2- <a href="https://www.coursera.org/specializations/c-programming">https://www.coursera.org/specializations/c-programming</a>	



## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION OF MATHEMATICS II

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Mathematics II</b>		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEE207		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronics Engineering
Module Leader	Ahmed A. Mohammed	e-mail	ahmed.mohammed@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Ahmed A. Mohammed	e-mail	ahmed.mohammed@uoninevah.edu.iq
Peer Reviewer Name	Dr. Sedki Thanoon	e-mail	sedki.thanoon@uoninevah.edu.iq
Scientific Committee Approval Date	16/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE206	Semester	1
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. To develop problem solving skills achieved in CIE112.</li><li>2. To dive into more advanced calculus analysis.</li><li>3. To understand what an integral is, and how it is related to derivatives.</li><li>4. To apply integration of transcendental functions.</li><li>5. To tackle most integration techniques.</li><li>6. To familiarize oneself with the polar coordinates system, and graph important polar equations.</li><li>7. To tackle the subject of sequences and series, define tests for series convergence and the strategy to choose the suitable test for a given series.</li><li>8. Explore the subject of power series, Taylor/Maclaurin series, and their applications.</li><li>9. The course primarily emphasizes calculus 2.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Comprehend Integration, definite, and indefinite integrals.</li><li>2. Apply Integration of transcendental functions.</li><li>3. Perform techniques of integration including integration using algebraic substitutions, trigonometric substitutions, integration by partial fraction expansion, integration by parts, and further substitutions.</li><li>4. Understand applications of integrals such as Arc length, surface area, etc.</li><li>5. Use the polar coordinates system, and graphs polar equations.</li><li>6. Define Sequences and series.</li><li>7. Comprehending Special Series such as Geometric series, P series, alternating series, etc.</li><li>8. Examining series for convergence using series tests for convergence.</li><li>9. Understand the power series.</li><li>10. Recognize and analyze Taylor/Maclaurin series.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Integration– Define what an integral is, definite and indefinite integrals, techniques of integration including integration using algebraic substitutions, trigonometric substitutions, integration by partial fraction expansion, integration by parts, and further substitutions. [30 hrs.].</p> <p>The polar coordinates system, and graph important polar equations. [10 hrs.].</p> <p>sequences and series: Define sequences, Define Series, special series, tests for series convergence and the strategy to choose the suitable test for a given series, power series, Taylor/Maclaurin series, and their applications. [ 30 hrs.].</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy is to enhance the fundamental mathematical abilities of engineering students, which are essential for comprehending engineering disciplines efficiently. The topics covered in this course will serve as fundamental building blocks, enabling students to pursue specialized studies in various engineering and technological domains.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	15% (15)	6, 9, 11	LO #1, 3, 4, 7, and 10
	<b>Assignments</b>	2	15% (15)	2, 12	LO # 2, 5, 6 and 10
	<b>Projects / Lab.</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	-	-
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hrs	10% (10)	8	LO # 1-4
	<b>Final Exam</b>	2hrs	50% (50)	16	All
<b>Total assessment</b>		100% (100 Marks)			

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	<b>Integration:</b> - The Fundamental Theorem of Calculus. - The Definite Integral + The Indefinite Integral.
<b>Week 2</b>	- Integration of Transcendental functions + Algebraic Substitutions.
<b>Week 3</b>	- Trigonometric substitutions.
<b>Week 4</b>	- Partial Fractions + - Integration by Partial Fraction Expansion.
<b>Week 5</b>	- Integration by parts.
<b>Week 6</b>	- Further substitutions + Arc length, surface area, etc.
<b>Week 7</b>	Mid Term Exam.
<b>Week 8</b>	The Polar Coordinates system + Polar equations.
<b>Week 9</b>	Graphs of Polar equations.
<b>Week 10</b>	Sequences and Series "the basics" + Special Series.
<b>Week 11</b>	Series – Convergence/Divergence + Integral Test.
<b>Week 12</b>	Comparison Test / Limit Comparison Test + Alternating Series Test.
<b>Week 13</b>	Absolute Convergence + Ratio Test + Root Test.
<b>Week 14</b>	Power Series + Power Series and Functions
<b>Week 15</b>	Taylor/Maclaurin series.
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1-2</b>	
<b>Week 3-4</b>	
<b>Week 5-6</b>	
<b>Week 7-8</b>	
<b>Week 9-10</b>	
<b>Week 11-12</b>	

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Thomas's Calculus	Yes
<b>Recommended Texts</b>	Engineering mathematics by o'neil, sixth edition	No
<b>Websites</b>		

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION OF AC ELECTRIC CIRCUITS

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	AC Electric Circuits		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEE216		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronics Engineering
Module Leader	Omar Mowaffak Alsaydia	e-mail	omar.alsaydia@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Sara Ihsan	e-mail	sara.basheer@uoninevah.edu.iq
Peer Reviewer Name	Maan Aladwany	e-mail	maan.aladwany@uoninevah.edu.iq
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE206	Semester	1
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1.</li><li>2. To develop problem solving skills and understanding of AC circuit theory through the application of techniques.</li><li>3. To understand waveform and frequency.</li><li>4. This course deals with the basic concept of AC electrical circuits.</li><li>5. To understand RMS value and average power.</li><li>6. This course deals with complex numbers in AC circuits.</li><li>7. Understanding AC in RL and RC</li><li>8. To perform mesh, Nodal analysis in AC circuits.</li><li>9. Understanding of Thevenin's in AC circuits.</li><li>10. Understanding RLC circuits and power factor</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Introduction to AC circuits.</li><li>2. List the various terms associated with AC electrical circuits.</li><li>3. Discuss RMS value and average power.</li><li>4. Describe electrical power, charge, and current.</li><li>5. Explain the complex numbers and how to use them in AC circuits.</li><li>6. Identify the capacitor and inductor phasor relationship with respect to voltage and current.</li><li>7. Explain Series and parallel connection to find total impedance.</li><li>8. Identify the phasor diagram.</li><li>9. Discuss the various properties of resistors, capacitors, and inductors.</li><li>10. Explain the two Kirchoff's laws used in circuit analysis.</li><li>11. Apply Mesh and Nodal analysis for AC circuits analysis.</li><li>12. Using Thevenin AC equivalent circuits for handy analysis techniques.</li><li>13. Explain the frequency response and resonance of a series RLC circuit.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>AC circuits – RMS and average value, complex numbers in AC, AC in R<sub>c</sub> and RL. [18 hrs]</p> <p>Phasor diagram, voltage and current divider, series and parallel AC circuits, mesh and nodal AC circuits analysis [18 hrs]</p> <p>Thevenin's equivalent in AC circuits, Frequency response and resonance of a series RLC circuit, power factor. [12 hrs]</p> <p>Revision problem classes [8 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم



<b>Strategies</b>	The main strategy will focus on developing a conceptual understanding of fundamental principles of AC circuit analysis techniques., while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering the type of simple experiments involving some interesting sampling activities for the students.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	88	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	10% (10)	6, 9, 13	LO #1, 3, 4, 7, and 12
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 2, 5, 6 and 11
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	10% (10)	13	LO # 5, and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-8
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
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	<b>Material Covered</b>
<b>Week 1</b>	Introduction to AC circuits
<b>Week 2</b>	RMS value and average power
<b>Week 3</b>	Complex number in AC
<b>Week 4</b>	AC through Resistor, capacitor, and inductor
<b>Week 5</b>	AC in RC circuits
<b>Week 6</b>	AC in RL circuits
<b>Week 7</b>	Phasor diagram
<b>Week 8</b>	Voltage and current divider in AC circuits
<b>Week 9</b>	Mid-term Exam
<b>Week 10</b>	Series and parallel in AC circuits
<b>Week 11</b>	Mesh Analysis in AC Circuits
<b>Week 12</b>	Nodal Analysis in AC Circuits
<b>Week 13</b>	Thevenin equivalent in AC circuits
<b>Week 14</b>	Frequency response and resonance of a series RLC circuit
<b>Week 15</b>	Power factor
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1-2</b>	Lab 1: Introduction to AC circuits
<b>Week 3-4</b>	Lab 2: Oscilloscope
<b>Week 5-6</b>	Lab 3: Capacitor phasor relationship with respect to voltage and current.
<b>Week 7-8</b>	Lab 4: Inductor phasor relationship with respect to voltage and current.
<b>Week 9-10</b>	Lab 5: Phasor diagram and phase shift
<b>Week 11-12</b>	Lab 6: AC circuit analysis
Week 13-14	Lab 7: frequency response and resonance of a series RLC circuit.

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Engineering Circuit Analysis: 8th edition, 2012 BY W. Hayt	Yes
<b>Recommended Texts</b>	Introductory Circuit Analysis: 10th edition, By R. L Boylestad	No
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a>	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required
<p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p>				

# MODULE DESCRIPTION OF DIGITAL TECHNIQUES

## وصف البرنامج الأكاديمي

Module Information		معلومات المادة الدراسية	
Module Title	Digital Techniques		
Module Type	Core	Module Delivery	
Module Code	NVEE217	<input checked="" type="checkbox"/> Theory	<input type="checkbox"/> Tutorial
ECTS Credits	6	<input checked="" type="checkbox"/> Lab	<input type="checkbox"/> Practical
SWL (hr/sem)	150	<input checked="" type="checkbox"/> Lecture	<input type="checkbox"/> Seminar
Module Level	1	Semester of Delivery	2
Administering Department	CIE	College	Electronics Engineering
Module Leader	SOHAIB RAJAB AWAD	E-mail	<a href="mailto:sohaib.awad@uoninevah.edu.iq">sohaib.awad@uoninevah.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	SOHAIB RAJAB AWAD	E-mail	<a href="mailto:sohaib.awad@uoninevah.edu.iq">sohaib.awad@uoninevah.edu.iq</a>
Peer Reviewer	Dr. Mohammed H. AL-Jammas	E-mail	<a href="mailto:mohammed.aljammas@uoninevah.edu.iq">mohammed.aljammas@uoninevah.edu.iq</a>
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules		العلاقة مع المواد الدراسية الأخرى	
Prerequisite module	None	Semester	----
Co-requisites module	None	Semester	----

Student Work Load (SWL)		الحمل الدراسي للطلاب	
Structured SWL (hour/semester)	88	Structured SWL (hour/week)	6
Unstructured SWL (hour/semester)	62	Unstructured SWL (hour/week)	4
Total SWL (hour/semester)	150		

Module Aims	أهداف المادة الدراسية
<p><b>1. Introduce the basic concepts of digital techniques:</b> This module aims to provide students with a solid understanding of the fundamental principles and terminology related to digital logic circuits. Students will learn about number systems, logic gates, Boolean algebra, truth tables, binary arithmetic, and Boolean function minimization.</p> <p><b>2. Develop skills in designing and analyzing digital circuits:</b> The module aims to equip students with the necessary skills to design and analyze digital logic circuits. Students will learn how to use various tools and techniques to build circuits, troubleshoot problems, and optimize circuit performance.</p> <p><b>3. Foster critical thinking and problem-solving abilities:</b> Through hands-on activities and exercises, this module aims to develop students' critical thinking and problem-solving skills in the context of digital circuits. Students will be challenged to apply logical reasoning to solve complex problems and develop efficient circuit designs.</p> <p><b>4. Explore different types of digital logic circuits:</b></p>	

The module aims to introduce students to a range of combinational digital logic circuits. Students will learn how these circuits are used to perform different functions, such as data manipulation and control.

**5. Promote teamwork and collaboration:**

This module aims to foster a collaborative learning environment where students can work together to solve problems and complete design projects. Through group activities and discussions, students will develop their teamwork and communication skills, which are essential in the field of digital techniques.

**6. Lay the foundation for advanced digital systems:**

The module aims to provide students with a strong foundation in digital logic circuits, which will serve as a basis for further studies in areas such as advanced digital design systems, computer architecture, embedded systems, and digital signal processing. Students will gain the knowledge and skills necessary to pursue more advanced topics in these domains.

*By the end of this module, students should have a solid understanding of number systems and digital logic principles, be able to design and analyze basic digital circuits, and possess the problem-solving skills required to tackle more complex digital system challenges.*

**Learning and Teaching Strategies**

**استراتيجيات التعلم والتعليم**

**1. Lectures:**

Engage students through interactive lectures that introduce key concepts, theories, and principles of digital techniques. Use visual aids, examples, and demonstrations to enhance understanding and provide real-world applications.

**2. Practical Laboratory Sessions:**

Provide hands-on experience through laboratory sessions where students can work with hardware components, logic gates, and design tools. Allow students to construct and test digital circuits, troubleshoot issues, and observe circuit behavior.

**3. Problem-Solving Exercises:**

Assign problem-solving exercises that require students to apply combinational logic circuits principles to solve practical problems. Encourage critical thinking and logical reasoning in identifying solutions and verifying their correctness.

**4. Group Discussions and Peer Learning:**

Foster collaboration and peer learning by organizing group discussions and activities. Encourage students to explain concepts to each other, share insights, and work together on complex problems or design projects.

**5. Case Studies and Real-World Examples:**

Present case studies or real-world examples that highlight the application of digital logic in various industries and technologies. Discuss how digital techniques are used in computer systems, telecommunications, or other relevant fields.

**6. Guest Lectures and Industry Talks:**

Invite guest speakers from industry or academia to share their expertise and experiences related to digital circuits. This provides students with practical insights and exposes them to real-world applications and career opportunities.

**7. Formative Assessments:**

Conduct regular formative assessments, such as quizzes or short assignments, to gauge students' understanding of concepts and identify areas that may require further clarification or reinforcement.

**8. Project-Based Learning:**

Assign individual or group projects that require students to design and implement digital circuits to solve specific problems or meet given requirements. This allows students to apply their knowledge in a practical context and develop their problem-solving and design skills.

**9. Online Resources and Interactive Tools:**

Provide access to online resources, such as video tutorials, interactive simulations, or digital textbooks, to support students' independent learning and reinforce concepts covered in lectures and practical sessions.

Indicative Contents	المحتويات الإرشادية
<p><b>1. Number Systems: [12 hours]</b>                      Decimal number system; Binary; Octal and hexadecimal number systems; Conversion from one to another number system; Addition; Subtraction; Multiplication and division using different number systems; Representation of binary number insignia-magnitude; Sign 1's and align 2's complements notation; Rules for addition and subtraction with complement Representation; BCD; EBCDIC; ASCII; Extended ASCII; Parity bit; Gray and other codes.</p> <p><b>2. Logic Gates and Boolean Algebra: [12 hours]</b>                      AND; OR; NOT; NAND; NOR; Ex-OR logic gates; Positive and negative logic; Fundamental concepts of Boolean algebra; De-Murrage's laws; Principles of duality; Simplification of Boolean expressions; Canonical and standard forms for Boolean function; SOP and POS forms; Realization of Boolean functions using NAND and NOR gates only; Design using available logic gates.</p> <p><b>3. Boolean Function Minimization: [8 hours]</b>                      Objectives of the minimization procedures; Karnaugh map method; Don't care conditions; Concept of prime implicates.</p> <p><b>4. Combinational Logic Circuits Using Discrete Logic Gates: [12 hours]</b>                      Half and full adder; Half and full subtractor; Parity bit generator and checker; Code converters; Binary multiplier; Majority circuits; magnitude comparator.</p> <p><b>5. Combinational Logic Circuit Using MSI Integrated Circuits: [12 hours]</b>                      Binary parallel adder; BCD adder; Encoder; Priority encoder; Decoder; Multiplexer and DeMultiplexer circuits; Implementation of Boolean functions using decoder and Multiplexer; Common anode and common cathode 7-segment displays; BCD to 7-segment decoder.</p>	

Module Learning Outcomes	مخرجات التعلم للمادة الدراسية
<p><b>By the end of this module, students should be able to:</b></p> <p><b>1. Understand the basic principles of digital techniques:</b>                      Demonstrate a comprehensive understanding of the concepts of digital techniques, including number systems, Boolean algebra, logic gates, truth tables, binary arithmetic, and the processes of minimizing Boolean functions.</p> <p><b>2. Design and analyze digital logic circuits:</b>                      Design and analyze digital logic circuits using appropriate tools and techniques. Apply knowledge of logic gates and Boolean algebra to create efficient and error-free circuit designs.</p> <p><b>3. Apply logical reasoning to problem-solving:</b>                      Apply logical reasoning skills to solve problems and troubleshoot issues related to combinational logic circuits.</p> <p><b>4. Construct and optimize digital logic circuits:</b>                      Construct and test digital logic circuits using appropriate hardware components.</p> <p><b>5. Comprehend different types of digital logic circuits:</b>                      Understand the principles and functionality of various types of combinational logic circuits.</p> <p><b>6. Collaborate effectively in team projects:</b></p>	

Work collaboratively with peers to complete combinational logic design projects.

**7. Demonstrate critical thinking and problem-solving skills:**

Apply critical thinking skills to analyze complex problems and devise appropriate solutions within the realm of digital logic.

**8. Communicate effectively about digital techniques concepts:**

Communicate technical concepts and ideas related to digital techniques effectively, both orally and in written form.

**9. Prepare for further studies in digital systems:**

Acquire a solid foundation in combinational logic circuits that serves as a basis for further studies in related fields.

Delivery Plan (Weekly Syllabus)		المنهاج الاسبوعي النظري
	Material Covered	
Week 1	Introduction to digital techniques Theory	
Week 2,3	Number Systems	
Week 4,5,6	Logic Gates and Boolean Algebra	
Week 7,8	Boolean Function Minimization	
Week 9	Mid-term Exam	
Week 10,11,12	Combinational Logic Circuits Using Discrete Logic Gates	
Week 13,14,15	Combinational Logic Circuit Using MSI Integrated Circuits	
Week 16	Preparatory week before the final Exam	

Delivery Plan (Weekly Laboratory Syllabus)		المنهاج الاسبوعي للمختبر
	Material Covered	
Week 1,2	Lab 1: Introduction to KL-31001 DIGITAL LOGIC LAB	
Week 3,4	Lab 2: Logic Gates	
Week 5,6	Lab 3: NAND,NOR,XOR Gates	
Week 7,8	Lab 4: AND-OR-INVERTER (A-O-I) Gates	
Week 9	Lab 5: Parity Bit Generator Circuits	
Week 10,11	Lab 6: Comparator Circuits	
Week 12,13	Lab 7: Adder and Subtractor Circuits	
Week 14,15	Lab 8: BCD Adder and 2's Complement Circuit	

Learning and Teaching Resources		مصادر التعلم والتدريس
	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> <li>• <b>Digital Design</b> by M. MORRIS MANO</li> <li>• <b>Digital Logic and Computer Design</b> by MORRIS MANO</li> </ul>	Yes
Recommended Texts	<ul style="list-style-type: none"> <li>• <b>Digital Computer Fundamentals</b> by BARTEE THOMAS</li> <li>• <b>Digital Integrated Electronics</b> by TAUB AND SCHILLING</li> <li>• <b>Modern Digital Design</b> by RICHARD SANDIGE</li> </ul>	No
Websites	<a href="http://www.allaboutcircuits.com/">http://www.allaboutcircuits.com/</a> This website provides a comprehensive resource for learning about electronics and digital logic. It offers tutorials, articles, and interactive tools to help beginners understand the basics of digital techniques and related concepts.	

Module Evaluation		تقييم المادة الدراسية			
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	4, 7, 13	# 1, 2, 3, 4, 5 and 6
	Assignments	3	10% (10)	3, 8, 13	# 2, 3, 4, 6 and 8
	Projects / Lab.	15	10% (10)	Continuous	# 1, 2, 5, 6, 7 and 8
	Report	1	10% (10)	12	# 8, and 9
Summative assessment	Midterm Exam	2 Hr.	10% (10)	9	# 1-8
	Final Exam	2 Hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Grading Scheme		مخطط الدرجات		
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 – 100)	A – Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C – Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	45 – 49	More work required but credit awarded
	F – Fail	راسب	0 – 44	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54). The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



# MODULE DESCRIPTION FORM ACADEMIC ENGLISH

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NV11		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronics Engineering
Module Leader	Noor Mothafar Hamid	e-mail	noorm.hame@duoninevah.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	MA
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. To develop skills, reading, writing and understanding of English language through the application of teaching techniques.</li><li>2. To understand scientific subjects and technical terms through reading and comprehension.</li><li>3. This course deals with the basic concepts of scientific subjects.</li><li>4. This course handles how to write simple research and how to make a successful presentation.</li><li>5. To understand the scientific language in English.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Recognize parts of speech and tenses in English language.</li><li>2. List the various terms associated with scientific texts.</li><li>3. Summarize what is meant by a basic electric circuit.</li><li>4. Discuss Electric currents, series and parallel circuits.</li><li>5. Describe electrical power, charge, and current.</li><li>6. Discuss computers, communication and the future of computers..</li><li>7. Identify the basic circuit elements and their applications.</li><li>8. Explain energy types and forms.</li><li>9. Discuss the various properties of radio waves and vacuum tubes.</li><li>10. Explain modulation.</li><li>11. Discuss Electromagnetism.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"><li>1. parts of speech _ verb _ noun _ pronoun</li><li>2. Tenses _ Past _ Present _ future</li><li>3. Electric currents and circuit _ AC/DC</li></ol>

	_parallel, serious _Grounding, fuse, short circuit 4. Radio waves and vacuum tubes 5. Electromagnetism. 6. The future of computers, communication applications. _fiber optics. 7. Induction. _Electric generator _Electric transformer _self-induction _servomechanism 8. Incandescent lamp. 9. Energy. _types of energy _forms of energy 10. Introduction to electron and electricity. 11. Electricity and electronics.
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### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation by reading, writing and comprehension in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, presentation, interactive tutorials, by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>
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### Student Workload (SWL)

#### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	30	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.4

<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	50
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<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	10% (10)	4,6	LO #1, 2, 3,4 ,5and 6
	<b>Assignments</b>	2	10% (10)	9, 12	LO # 7,8,9,10,and 11
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	10% (10)	13	LO # 6,10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-8
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Parts of speech
<b>Week 2</b>	Tenses
<b>Week 3</b>	Electric currents and circuit
<b>Week 4</b>	Radio waves and vacuum tubes
<b>Week 5</b>	The future of computers, communication applications.
<b>Week 6</b>	Induction -Electric generator -Electric transformer
<b>Week 7</b>	Mid-term Exam
<b>Week 8</b>	Induction -Self-induction -Servomechanism
<b>Week 9</b>	Incandescent lamp.
<b>Week 10</b>	Energy. -types of energy -forms of energy

<b>Week 11</b>	Introduction to electron and electricity.
<b>Week 12</b>	Electricity and electronics
<b>Week 13</b>	The cathode ray tube
<b>Week 14</b>	Propagation
<b>Week 15</b>	Modulation
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	English in electrical engineering and electronics. The language of electrical and electronic engineering in English.	Yes
<b>Recommended Texts</b>	English for electrical engineering and computing.	No
<b>Websites</b>	<a href="https://www.askoxford.com/betterwriting/sucesfulcv/application/?view=uk">https://www.askoxford.com/betterwriting/sucesfulcv/application/?view=uk</a>	

### Grading Scheme

## مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM ENGINEERING DRAWING AND AUTOCAD

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Engineering Drawing		Module Delivery	
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	NVEE201			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	1	Semester of Delivery		2
Administering Department	CIE	College	EE	
Module Leader	Yazen Hudhaifa Shakir		e-mail	yazen.shakir@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	MSc.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>After completing this course module, the student must be able to:</p> <ol style="list-style-type: none"><li>1. Define the terms related to computer-aided drafting systems in general and AutoCAD; for specific.</li><li>2. Identify the important tools used to create technical drawings in CAD;</li><li>3. Create electronic drawings (e-drawing) using CAD;</li><li>4. Apply the usefulness of the knowledge and skills in computer aided drafting as applied in his/her professional development.</li><li>5. Examine the utility of AutoCAD Electrical as a software solution for the creation and manipulation of schematic diagrams.</li><li>6. Applies knowledge of mathematics, science and engineering,</li><li>7. Design and conduct experiments, as well as to analyze and interpret data</li></ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1- Using AutoCAD Interface: Students should become familiar with the AutoCAD user interface, including the various tools, menus, and commands available in the software.</li><li>2- Creating 2D Drawings: Learners should gain proficiency in creating accurate and detailed 2D drawings using AutoCAD. This includes drawing lines, circles, arcs, polygons, and other geometric shapes.</li><li>3- Modifying and Editing Drawings: Students should be able to modify existing drawings by using AutoCAD's editing tools. This involves techniques such as scaling, stretching, rotating, mirroring, and trimming objects.</li><li>4- Working with Layers and Line-types: Participants should learn how to effectively use layers to organize and manage different elements of a drawing. They should also understand line-types and how to apply them to objects.</li><li>5- Adding Annotations and Dimensions: Learners should be able to add text annotations, labels, and dimensions to their drawings using AutoCAD's annotation tools. This includes adding dimensions, text, and leaders to convey information accurately.</li><li>6- Creating and Managing Blocks: Students should gain proficiency in creating reusable blocks in AutoCAD. This involves creating block definitions, inserting blocks into drawings, and modifying blocks when necessary.</li><li>7- Understanding 3D Concepts: Gain a clear understanding of fundamental 3D concepts, including coordinate systems, viewpoints, and 3D navigation techniques.</li><li>8- Creating Basic 3D Objects: Learn how to create basic 3D objects, such as cubes, spheres, cylinders, cones, and pyramids, using AutoCAD's 3D modeling tools.</li></ol>



	<p>9- Modifying 3D Objects: Develop the ability to modify 3D objects by moving, rotating, scaling, mirroring, or stretching them in 3D space to achieve the desired shape and position.</p> <p>10- Performing Printing and Plotting: Participants should learn how to set up and configure layouts for printing and plotting drawings. They should understand the different print settings, paper sizes, and scales.</p> <p>11- Glance to the basic electrical diagrams in AutoCAD Electrical</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A – 2D Drawing</u></p> <ol style="list-style-type: none"> <li>1- Drawing Area: The drawing area is where the actual geometry and objects are created.</li> <li>2- Lines and Polylines: Lines and polylines are fundamental objects used to represent edges, outlines, and boundaries of various components in the drawing. They can be straight or curved, and they form the basis for creating other geometric shapes.</li> <li>3- Circles and Arcs:</li> <li>4- Layers: Layers are used to organize and control the visibility of different elements in the drawing.</li> <li>5- Text: Text is used to add annotations, labels, and other textual information to the drawing</li> <li>6- Dimensions: AutoCAD offers various dimensioning tools to add accurate measurements to the drawing. Linear dimensions, angular dimensions, and radial dimensions can be added to specify distances, angles, and sizes of objects.</li> <li>7- Blocks and Symbols: Blocks are pre-defined groups of objects that can be reused multiple times in a drawing. They are often used to represent standard components or symbols. AutoCAD allows users to create custom blocks or use existing libraries of blocks and symbols.</li> <li>8- Plotting and Printing: AutoCAD provides tools for plotting and printing the final drawing. This includes specifying the paper size, scale, print area, and setting up the plot style to control line weights and colors when generating physical or digital outputs. <b>[60 hr.]</b></li> </ol> <p><u>Part B – 3D Drawing</u></p> <p>Introduction to 3D Modeling, Navigating the 3D workspace in AutoCAD          Creating basic 3D geometric shapes (cubes, spheres, cylinders) , Editing and modifying basic 3D objects , Applying basic transformations (move, rotate, scale) to 3D objects          Advanced 3D Objects, Using viewports to control multiple views of a 3D model          Controlling perspective and orthographic views, Understanding and utilizing the 3D navigation tools <b>[34 hr.]</b></p>

	<p><u>Part C – AutoCAD Electrical</u></p> <p>Introduction to workspace and main difference in panels</p> <p>Create simple projects inside AutoCAD Electrical [<b>6 hr.</b>]</p>
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### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ul style="list-style-type: none"> <li>• <b>Hands-On Practice:</b> Provide ample opportunities for students to practice using AutoCAD through hands-on exercises and projects.</li> <li>• <b>Visual Aids and Examples:</b> Utilize visual aids, such as slides, diagrams, and video tutorials, to complement your explanations and make complex concepts more understandable. Provide examples and showcase real-world applications of AutoCAD to demonstrate its relevance and inspire students.</li> <li>• <b>Resources and References:</b> Provide students with additional resources, such as textbooks, online tutorials, and reference guides, to support their learning outside the classroom. Recommend reputable websites, forums, and communities where they can seek further assistance and expand their knowledge.</li> <li>• <b>Continuous Learning:</b> Encourage students to continue learning AutoCAD beyond the classroom. Highlight the importance of staying up-to-date with new features, tools, and techniques by exploring online resources, attending webinars, or participating in AutoCAD user communities.</li> </ul>
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### Student Workload (SWL)

#### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

### Module Evaluation

#### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	3, 9	LO #2, 3, 5 and 6
	<b>Assignments</b>	2	10% (10)	4, 13	LO # 8, 9, 6 and 7
	<b>Projects / Lab.</b>	1	10% (10)	15	LO# 11
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	<b>Introduction to CAD , Introduction to AutoCAD</b>
Week 2	<b>AutoCAD Fundamentals</b> <ul style="list-style-type: none"> <li>• Screen layout</li> <li>• Have a brief look at the AutoCAD Toolbars</li> <li>• Opening existing Drawing files</li> <li>• Saving your works</li> <li>• Coordinates systems</li> </ul>
Week 3	<b>Basics of Drawing or drafting (2D) in AutoCAD</b> <ul style="list-style-type: none"> <li>• Preparing the area of drawing</li> <li>• Drawing Lines</li> <li>• Polyline</li> <li>• Polygons</li> <li>• Circle drawing methods</li> <li>• View Port Tools</li> </ul>
Week 4	<ul style="list-style-type: none"> <li>• Two practical examples for practicing on AutoCAD Interface and coordinate systems</li> </ul>
Week 5	<b>2D- Modify Commands</b> Using the following Commands: <ul style="list-style-type: none"> <li>• Move , Copy , Rotate ,Mirror</li> <li>• Trim, fillets, offset</li> <li>• Scale , Array</li> </ul>
Week 6	<ul style="list-style-type: none"> <li>• Two practical examples for practicing on AutoCAD Modify Tools</li> </ul>
Week 7	<b>Annotation and Layers</b> <ul style="list-style-type: none"> <li>• Multiline Texts</li> <li>• Create linear dimensions</li> <li>• Layer Properties</li> <li>• Create group of objects</li> </ul>
Week 8	<ul style="list-style-type: none"> <li>• Two practical examples for practicing on Dimensions and layers for two different figures</li> </ul>
Week 9	<ul style="list-style-type: none"> <li>• Review on 2D- drafting with answering questions for students</li> </ul>
Week 10	<b>Basics of 3D in AutoCAD-Part 1</b> <ul style="list-style-type: none"> <li>• Why use 3D drawing</li> <li>• Introduction to Orthographic Projection and Isometric</li> <li>• Switching to 3D- Modelling workspace in AutoCAD</li> </ul>
Week 11	<b>Basics of 3D in AutoCAD-Part 2</b> <ul style="list-style-type: none"> <li>• Introduction to the Modelling commands (Basics) (Extrude, Press Pull and Solid Editing Tools )</li> </ul>
Week 12	<ul style="list-style-type: none"> <li>• One practical examples for practicing on 3D figure and Solid editing</li> </ul>
Week 13	<ul style="list-style-type: none"> <li>• Two different multi-view projections tutorials</li> </ul>
Week 14	<b>Glance to AutoCAD Electrical</b> <ul style="list-style-type: none"> <li>• Introduction to AutoCAD electrical and how to use wire panel</li> </ul>
Week 15	<ul style="list-style-type: none"> <li>• Create projects and dealing with templates based on IEC standards for Control Engineers</li> </ul>
Week 16	<b>Preparatory week before the final Exam</b>

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	150 CAD Exercises Book by Sachidanand JHA	NO
Recommended Texts	<p>1- Fundamentals of Engineering Drawing - أساسيات الرسم الهندسي</p> <p>By : Ahmed Nidham Mohammed</p> <p>Publisher: Dar Al-Waddah For Publishing &amp; Distribution - Amman - Jordan</p> <p>ISBN: 9789923190906</p> <p>2. 2020 / أساسيات اوتوكاد / Fundamentals of AutoCAD 2020</p> <p>By : Ahmed Nidham Mohammed</p> <p>Edition: First</p> <p>Publisher: Dar Al-Waddah For Publishing &amp; Distribution - Amman - Jordan</p> <p>ISBN: 9789923190418</p>	Available online
Websites	<p><a href="https://www.youtube.com/c/CADCAMTUTORIAL">https://www.youtube.com/c/CADCAMTUTORIAL</a></p> <p><a href="https://www.computeraideddesignguide.com/">https://www.computeraideddesignguide.com/</a></p> <p><a href="https://autocadfiles.com/">https://autocadfiles.com/</a></p>	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
<p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p>				

# Module Description of Physical Electronics

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Physical Electronics		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CIE114		
ECTS Credits	4		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronic Engineering
Module Leader	Sama Nazar Mohamed	e-mail	sama.mohamed@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer Assistant	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Maan Aladwany	e-mail	maan.aladwany@uoninevah.edu.iq
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Electronics (CIE215)	Semester	Three
Co-requisites module	None	Semester	

# MODULE DESCRIPTION FORM of The Crimes of the Bath regime in Iraq

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	The Crimes of the Bath regime in Iraq		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NV13		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGI	Semester of Delivery	
Administering Department	Dept. of Biomedical Engineering- BME	College	College of Electronics Engineering- EE
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	Sep. 01, 2024	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	للتعرف والاطلاع على مجموعة من الجرائم التي ارتكبتها حزب البعث البائد والمنحل بحق أبناء الشعب العراقي ومن مختلف المكونات لأطيافه ولتأسيس وعي للطلبة لرفض جميع اشكال الظلم والتسلط لهذه الأنظمة والمطالبة بجميع الحقوق المدنية والسياسية
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1- تعرف الطالب على جرائم البعث وفق قانون المحكمة الجنائية العراقية</li><li>2- للتمييز بين مفهوم الجرائم واقسامها</li><li>3- لتوضيح الطالب المصطلح واللغة</li><li>4- للتعرف على اقسام الجرائم</li><li>5- للتعرف على أنواع الجرائم الدولية</li><li>6- للتعرف على القرارات الصادرة من المحكمة الجنائية</li><li>7- للتعرف على الجرائم النفسية والاجتماعية وابرز</li><li>8- للتعرف على الجرائم النفسية</li><li>9- للتعرف على آليات الجرائم النفسية</li><li>10- للتعرف على آثار الجرائم النفسية</li><li>11- للتعرف على الجرائم الاجتماعية</li><li>12- للتعرف على صور انتهاكات حقوق الانسان</li><li>13- للتعرف على تدمير المدن والقرى</li><li>14- للتعرف على تجفيف الاهوار</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"><li>1. <b>تعريف الجرائم وأقسامها:</b><ul style="list-style-type: none"><li>○ مفهوم الجريمة وأنواعها، بما في ذلك الجرائم الدولية والجرائم النفسية والاجتماعية.</li><li>○ تصنيف الجرائم إلى جرائم سياسية وعسكرية.</li></ul></li><li>2. <b>الجرائم تحت نظام البعث:</b><ul style="list-style-type: none"><li>○ موقف النظام البعثي من الدين وانتهاكات القوانين العراقية.</li><li>○ قرارات النظام المتعلقة بالانتهاكات السياسية والعسكرية.</li></ul></li><li>3. <b>آليات الجرائم والجرائم البيئية:</b><ul style="list-style-type: none"><li>○ دراسة آليات تنفيذ الجرائم.</li><li>○ الجرائم البيئية، بما في ذلك التلوث الحربي والإشعاعي وتجريف البساتين.</li></ul></li><li>4. <b>المقابر الجماعية:</b><ul style="list-style-type: none"><li>○ تفاصيل حول الجرائم المرتبطة بالمقابر الجماعية، التصنيف الزمني لمقابر الإبادة الجماعية، وأحداث المقابر.</li></ul></li><li>5. <b>التأثيرات الاجتماعية والبيئية:</b><ul style="list-style-type: none"><li>○ آثار عسكرية المجتمع، تدمير المدن والقرى، وتجفيف الأهوار.</li></ul></li></ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

Strategies	طريقة اللقاء والحوار والناقشة.
	1- استراتيجيات التعليم تخطيط المفهوم التعاوني . 2- استراتيجيات التعليم العصف الذهني. 3- استراتيجيات التعليم سلسلة الملاحظات

## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.133
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	50		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	13	LO #5, #8 and #10
	Midterm Exam	2hr	10% (10)	7	LO #1 - #7



Summative assessment	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
Week 1	مفهوم الجرائم واقسامها تعريف الجريمة اقسام الجرائم انواع الجرائم الدولية القرارات الصادرة من المحكمة الجنائية العلي
Week 2	الجرائم النفسية البيات الجرائم
Week 3	الجرائم الاجتماعية عسكرة المجتمع
Week 4	موقف النظام البعثي من الدين انتهاكات القوانين العراقية
Week 5	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث
Week 6	اماكن السجون والاحتجاز
Week 7	الجرائم البيئية لنظام البعث العراقي
Week 8	التلوث الحربي والاشعائي وانفجار الالغام
Week 9	تدمير المدن والقرى تجفيف الاهوار
Week 10	امتحان منتصف الكورس
Week 11	تجريف البساتين
Week 12	جرائم المقابر الجماعية
Week 13	احداث مقابر الابادة الجماعية

Week 14	التصنيف الزمني لمقابر الابداء الجماعية
Week 15	مواقع المقابر الجماعية

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	جرائم حزب البعث . مقرر دراسي من قبل الوزارة	No
Recommended Texts		
Websites	<a href="https://foulabook.com/ar/books/%D9%85%D8%B3%D8%B1%D8%AD%D9%8A%D8%A7%D8%AA/%D8%A7%D9%84%D8%A3%D8%AF%D8%A8-%D8%A7%D9%84%D8%B9%D8%A7%D9%84%D9%85%D9%8A">https://foulabook.com/ar/books/%D9%85%D8%B3%D8%B1%D8%AD%D9%8A%D8%A7%D8%AA/%D8%A7%D9%84%D8%A3%D8%AF%D8%A8-%D8%A7%D9%84%D8%B9%D8%A7%D9%84%D9%85%D9%8A</a>	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

# MODULE ANALOGUE COMMUNICATIONS

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Communication Principles</b>		Module Delivery
Module Type	<b>Support</b>		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>NVEE22</b>		
ECTS Credits	<b>4</b>		
SWL (hr/sem)	<b>100</b>		
Module Level	<b>2</b>	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronic Engineering
Module Leader	Maan A. S. Al-Adwany	e-mail	maan.aladwany@uoninevah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	M.Sc.
Module Tutor	Maan A. S. Al-Adwany	e-mail	maan.aladwany@uoninevah.edu.iq
Peer Reviewer Name	Mohammad Al-Jammas	e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE210	Semester	3
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Understanding Analogue Communication Theory.</li><li>2. Understanding Transmission Lines and their applications.</li><li>3. Understanding the modulation theory.</li><li>4. Understanding types of Amplitude Modulation.</li><li>5. Understanding Angle Modulation</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Describing Transmissions Lines Equations; Transmission Bandwidth Concept; Distortionless Transmission Conditions; Types of Transmission Media.</li><li>2. Understanding Amplitude Modulation through recognizing Modulation index; Spectrum of AM; DSB and SSB transmission with and without carriers; VSB Transmission; Amplitude Modulators; Envelop Detectors Balanced Modulator; SSB Signal Generation and Demodulation Schemes.</li><li>3. Understanding Angle Modulation through recognizing: Modulation Index; Spectrum Calculation for Sinusoidal Waveform; Phase Modulation; Relationship Between FM and PM; NBFM and WBFM; Frequency Modulators (Armstrong method).</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following:</p> <ol style="list-style-type: none"><li>1. Transmissions Lines Equations; Transmission Bandwidth Concept; Distortionless Transmission Conditions; Types of Transmission Media. ( 24 Hrs)</li><li>2. Amplitude Modulation: Modulation index; Spectrum of AM; DSB and SSB transmission with and without carriers; VSB Transmission; Amplitude Modulators; Envelop Detectors Balanced Modulator; SSB Signal Generation and Demodulation Schemes. ( 20 Hrs)</li><li>3. Angle Modulation: Modulation Index; Spectrum Calculation for Sinusoidal Waveform; Phase Modulation; Relationship Between FM and PM; NBFM and WBFM; Frequency Modulators (Armstrong method). ( 12 Hrs)</li></ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy will be to focus on developing a conceptual understanding of fundamental principles such as transmission lines and modulation theory , while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering the type of simple experiments involving some interesting sampling activities for the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	60	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	40	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.7
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	20% (20)	6, 11	LO #1,2,3
	<b>Assignments</b>	2	4% (4)	2, 12	LO #1,2,3
	<b>Onsite Assignments</b>	2	6% (6)	7,13	LO #1,2,3
	<b>seminars</b>	1	10% (10)	14	LO #1,2
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	8	LO # 1-2
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Transmission lines equations
Week 2	Space-time diagram
Week 3	Space-time diagram
Week 4	Smith chart
Week 5	Smith chart
Week 6	Smith chart
Week 7	Introduction to Modulation Theory
Week 8	Midterm Exam + Amplitude Modulation
Week 9	Amplitude Modulation
Week 10	Amplitude Demodulation
Week 11	Amplitude Demodulation
Week 12	Introduction to Angle Modulation
Week 13	Frequency Modulation
Week 14	Frequency Modulation
Week 15	Frequency Modulation
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1-2	
Week 3-4	
Week 5-6	
Week 7-8	
Week 9-10	
Week 11-12	
Week 13-14	

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Introduction to Communication Systems, By Stremler.	Yes
<b>Recommended Texts</b>	Introduction to Analog and Digital Communication Systems, By Haykin.	No
<b>Websites</b>	<a href="https://www.wiley.com/en-us/An+Introduction+to+Analog+and+Digital+Communications%2C+2nd+Edition-p-9781118313107">https://www.wiley.com/en-us/An+Introduction+to+Analog+and+Digital+Communications%2C+2nd+Edition-p-9781118313107</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION OF ENGINEERING ANALYSIS I

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Analysis I		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEE208		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	3
Administering Department	Dept. of Computer and Information	College	College of Electronics Engineering
Module Leader	Ahmed A. Mohammed	e-mail	ahmed.mohammed@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Ahmed A. Mohammed	e-mail	ahmed.mohammed@uoninevah.edu.iq
Peer Reviewer Name	Dr. Bilal Al-Layla	e-mail	bilal.allayla@uoninevah.edu.iq
Scientific Committee Approval Date	16/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE207	Semester	2
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To build on the achieved skills in CIE122.</li> <li>2. To employ advanced analytical methods in problem solving.</li> <li>3. Get familiar with most of problems in space.</li> <li>4. Evaluate integrals in space.</li> <li>5. The student would also be introduced to applications of derivatives and integrals in space.</li> <li>6. Tackle the subject of first-order differential equations their types, solutions methods, and applications.</li> <li>7. Tackle Higher order differential equations.</li> <li>8. Differentiate ordinary differential equations from partial differential equations.</li> <li>9. The course primarily emphasizes Calculus 3 and advanced engineering mathematics.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Review vectors, vector functions, and derivatives in space.</li> <li>2. Perform double integrals in Cartesian coordinates.</li> <li>3. Perform Double integrals in polar coordinates.</li> <li>4. Apply triple integration in Cartesian coordinates.</li> <li>5. Apply triple integration in cylindrical coordinates.</li> <li>6. Apply triple integration in spherical coordinates.</li> <li>7. Comprehend the concept of ODEs and their applications.</li> <li>8. Tackle 1st order ODEs, and use several methods to solve them.</li> <li>9. Tackle 2nd order and higher ODEs and their methods of solution.</li> <li>10. Extend the subject of ODEs to power series solution of differential equations.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p> <p>Review of vectors, Multiple integrals, double integrals in Cartesian and polar coordinates, triple integrals in Cartesian, cylindrical, and spherical coordinates. [20 hrs.]</p> <p>Introduction to differential equations, Initial value problem, differential equations as a mathematical model, First-order DEs, separable equations, Linear equations, exact equations, solution by substitution, Linear Models, and graphing solutions to First-order DEs. [28 hrs.]</p> <p>Higher Order differential equations, theory of linear equations (Homogeneous and non-homogeneous equations), Homogeneous equations with constant coefficients, Undetermined coefficients, variations of parameters, Cauchy-Euler equation. [24 hrs.]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy is to enhance the fundamental mathematical abilities of engineering students, which are essential for comprehending engineering disciplines efficiently. The topics covered in this course will serve as fundamental building blocks, enabling students to pursue specialized studies in various engineering and technological domains.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	60	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	18% (18)	4, 8, 13	LO #1, 3, 4, 7, and 10
	<b>Assignments</b>	2	10% (10)	5,10	LO # 2, 5, 6 and 10
	<b>Onsite Assignments</b>	1	5% (5)	9	LO # 1,3,5,6,8, and 9
	<b>Report</b>	1	7% (7)	14	LO # 1-15
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hrs	10% (10)	8	LO # 1-7
	<b>Final Exam</b>	3 hrs	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Multiple Integrals: - Double Integrals in Cartesian coordinates.
<b>Week 2</b>	- Double Integrals in Polar coordinates.
<b>Week 3</b>	Multiple Integrals: - Triple Integrals Cartesian + Cylindrical coordinates.
<b>Week 4</b>	- Triple Integrals spherical coordinates.
<b>Week 5</b>	- Introduction to differential equations, - Initial value problem, - Differential equations as a mathematical model
<b>Week 6</b>	- First-order DEs. - separable equations + exact equations,
<b>Week 7</b>	Mid-term Exam
<b>Week 8</b>	- Linear equations.
<b>Week 9</b>	- Solution by substitution.
<b>Week 10</b>	- Linear Models.
<b>Week 11</b>	- Graphing solutions to First-order DEs.
<b>Week 12</b>	Higher Order differential equations, theory of linear equations (Homogeneous and non-homogeneous equations), - Homogeneous equations with constant coefficients.
<b>Week 13</b>	- Undetermined coefficients
<b>Week 14</b>	- Variations of parameters.
<b>Week 15</b>	- Cauchy-Euler equation
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1-2</b>	
<b>Week 3-4</b>	
<b>Week 5-6</b>	
<b>Week 7-8</b>	
<b>Week 9-10</b>	

Week 11-12	
Week 13-14	

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas's Calculus 12 <sup>th</sup> edition	Yes
Recommended Texts	Advanced Engineering Mathematics by KREYSIK	No
Websites		

### Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM SIGNALS AND SYSTEMS

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Signals and Systems		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEE210		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	3
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Bilal Al-Layla	e-mail	E-mail: bilal.allayla@uoninevah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Bilal Al-Layla	e-mail	E-mail: bilal.allayla@uoninevah.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE207	Semester	2
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Introduce students to signals and systems along with their characteristics and properties.</li> <li>2. To develop an awareness and understanding of the system's impulse response and Convolution</li> <li>3. To develop problem-solving skills for basic signal processing techniques.</li> <li>4. Introduce students to the Fourier series representation of the signals.</li> <li>5. Introduce students to MATLAB and use it to generate signals, solve linear algebra problems, and simulate various signal processing techniques.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Recognize, sketch, and manipulate basic signals that are commonly used in engineering applications</li> <li>2. Learn the properties of these basic signals.</li> <li>3. Be able to classify signals using various criteria such as energy, power, and duration.</li> <li>4. Learn signal transformation operations.</li> <li>5. Be able to identify system properties of linearity, time (in)variance, causality, memory, and stability.</li> <li>6. Define the impulse response of LTI systems and perform CT convolution to obtain the output of these systems.</li> <li>7. Use the Fourier series to represent continuous time signals and describe their characteristics.</li> <li>8. Obtain single and double-sided spectrum of signals from their Fourier-series representation.</li> <li>9. Develop the ability to apply appropriate mathematical techniques to solve problems.</li> <li>10. Students will be able to use MATLAB to obtain systems' output and signal transformations and analyses.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Fundamental Concepts of Signals &amp; Systems [12 hrs]</u></p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Signals and Their Classification</li> <li>• Elementary Continuous and Discrete Time Signals</li> <li>• Operations on Signals</li> <li>• Systems and Classification of Systems</li> </ul> <p><u>Linear Time-Invariant Systems [9 hrs]</u></p> <ul style="list-style-type: none"> <li>• Response of a Continuous Time LTI System and Convolution Integral</li> </ul>

	<ul style="list-style-type: none"> <li>• Properties of Continuous and Discrete Time LTI System</li> <li>• Response of a Discrete Time LTI System and Convolution Sum</li> </ul> <p><u>Time Domain Representation of Signals Using Fourier Series [12 hrs]</u></p> <ul style="list-style-type: none"> <li>• Introduction to Fourier Series</li> <li>• Trigonometric Fourier Series</li> <li>• Single Sided Spectrum</li> <li>• Complex Exponential Fourier Series</li> <li>• Double Sided Spectrum</li> <li>• Parseval's Power Theorem</li> </ul>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>The main strategy that will be adopted is a combination of the flipped class and the conventional class to deliver this module and encourage students' participation in the exercises, while at the same time refining and expanding their problem-solving and critical thinking skills. This will be achieved through online videos, classes, interactive tutorials, and by considering MATLAB-based exercises to further improve the students' engagement with the module.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	75	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Quizzes	3	15% (15)	5, 10	LO #1, 2, 3, 5, and 8

Formative assessment	Assignments	5	5% (5)	2,4,6,10, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	15% (15)	14	LO # 11
	seminars	1	5% (5)	13	LO # 7-10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Fundamental Concepts of Signals & Systems and signal classification
Week 2	Signals Manipulation
Week 3	Elementary Continuous and Discrete Time Signals
Week 4	Signals Properties
Week 5	Systems representation
Week 6	Systems and Classification of Systems
Week 7	Response of a Discrete Time LTI System and Convolution Sum
Week 8	Mid-term exam
Week 9	Response of a Continuous Time LTI System
Week 10	Convolution Integral
Week 11	Introduction to Fourier series.
Week 12	Trigonometric Fourier Series
Week 13	Single-Sided Spectrum
Week 14	Parseval's Power Theorem
Week 15	Revision
Week 16	A preparatory week before the Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1-2	Lab 1: Introduction to MATLAB



<b>Week 3-4</b>	Lab 2: Dealing with vectors and matrices using MATLAB
<b>Week 5</b>	Lab 3: Matrix Functions
<b>Week 6-7</b>	Lab 4: Mathematical Operations using MATLAB
<b>Week 8</b>	Lab 5: Overview of MATLAB Plotting
<b>Week 9-10</b>	Lab 6: Generating Signals
<b>Week 11</b>	Lab 7: Control Flow and Operators
<b>Week 12</b>	Lab 8: Convolution
<b>Week 13</b>	Lab 9: Fourier Series
<b>Week 14</b>	Fourier Transform

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Signals and Systems by Simon S. Haykin	Yes
<b>Recommended Texts</b>	Digital Signal Processing: Concepts and Applications, Bernard Mulgrew, Peter Grant, and John Thompson. Palgrave Macmillan, 2nd Edition, ISBN 0-333-96356-3	No
<b>Websites</b>	<a href="https://www.youtube.com/@bilalal-layla5493">https://www.youtube.com/@bilalal-layla5493</a>	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work is required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	A considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION OF ELECTRONICS

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Electronics</b>		Module Delivery
Module Type	<b>Core</b>		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>NVEE224</b>		
ECTS Credits	<b>5</b>		
SWL (hr/sem)	<b>125</b>		
Module Level	UGII	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronics Engineering
Module Leader	Mohammad Jassim Mohammad	e-mail	<a href="mailto:mohammad.jassim@uoninevah.edu.iq">mohammad.jassim@uoninevah.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Maan Aladwany	e-mail	<a href="mailto:maan.aladwany@uoninevah.edu.iq">maan.aladwany@uoninevah.edu.iq</a>
Scientific Committee Approval Date	15/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE218	Semester	2
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Introduce characteristics and applications of semiconductor devices:<ul style="list-style-type: none"><li>• Explain the properties and behaviors of transistors.</li><li>• Explore various applications of transistors in electronic circuits and systems.</li></ul></li><li>2. Understand construction and operation of transistors:<ul style="list-style-type: none"><li>• Describe the construction and internal workings of transistors.</li><li>• Explain how transistors function within electronic circuits.</li></ul></li><li>3. Analyze analog amplifier circuits:<ul style="list-style-type: none"><li>• Teach different analysis methods for analog amplifier circuits, including gain, frequency response, and distortion analysis.</li><li>• Enable students to understand the behavior and performance of analog amplifiers.</li></ul></li><li>4. Study biasing techniques for electronic circuits:<ul style="list-style-type: none"><li>• Introduce various biasing methods used to establish the operating conditions of transistors.</li><li>• Explain how biasing affects the performance and stability of electronic circuits.</li></ul></li><li>5. Develop design skills for electronic circuits:<ul style="list-style-type: none"><li>• Enable students to apply their knowledge of transistors and amplifier circuits to design electronic circuits.</li><li>• Teach techniques for designing circuits that meet specific requirements and perform desired functions.</li></ul></li><li>6. Explore parameters affecting amplifier circuits:<ul style="list-style-type: none"><li>• Introduce parameters such as input/output impedance, voltage gain, power gain, and bandwidth that affect amplifier circuits.</li><li>• Explain how these parameters influence the performance and behavior of amplifier circuits.</li></ul></li><li>7. Understand practical applications of transistors and circuits:<ul style="list-style-type: none"><li>• Demonstrate real-world applications of transistors and circuits, such as audio amplifiers, power supplies, and communication systems.</li><li>• Provide examples of electronic systems where these components are commonly used.</li></ul></li></ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Explanation of the structure and operation of NPN and PNP bipolar junction transistors.</li><li>2. Analysis of BJT biasing circuits, including fixed bias, emitter bias, and voltage-divider bias.</li><li>3. Understanding the transistor operating regions (active, cutoff, saturation) and load line analysis.</li><li>4. Introduction to BJT amplifier configurations, including common-emitter,</li></ol>

	<p>common-base, and common-collector.</p> <ol style="list-style-type: none"> <li>5. Understanding the stability of BJT transistor.</li> <li>6. Understanding of the cascade system of BJT transistor.</li> <li>7. Introduction to BJT frequency response (low and high).</li> <li>8. Overview of the construction and operation of junction FETs (JFETs)</li> <li>9. Understanding FET biasing techniques such as fixed bias, self-bias, and voltage-divider bias.</li> <li>10. Analysis of FET amplifier configurations, including common-source, common-gate, and common-drain.</li> <li>11. Understanding of the cascade system of FET transistor.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> <li>1. Bipolar Junction Transistors (BJTs) [18 hrs]: <ul style="list-style-type: none"> <li>• Introduction to bipolar junction transistors and their operation: NPN and PNP transistors, transistor construction, and modes of operation.</li> <li>• BJT biasing techniques and stability analysis: Base bias, emitter bias, voltage-divider bias, and bias stabilization methods.</li> <li>• BJT amplifier configurations and analysis: Common-emitter, common-base, and common-collector configurations, small-signal analysis, and frequency response.</li> <li>• BJT switching circuits: Transistor as a switch, saturation, and cutoff regions, and switching speed considerations.</li> </ul> </li> <li>2. Field-Effect Transistors (FETs) [18 hrs]: <ul style="list-style-type: none"> <li>• Introduction to field-effect transistors and their operation: JFET (Junction Field-Effect Transistor) principles of operation.</li> <li>• FET biasing and amplifier configurations: Self-bias configuration, voltage-divider bias configuration, common-source, common-gate, and common-drain amplifier configurations.</li> <li>• JFET characteristics and analysis: regions of operation, pinch-off voltage, JFET voltage-controlled device characteristics, and FET small-signal analysis.</li> </ul> </li> </ol> <p>Revision problem classes [8 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy will be focus on developing proficiency in small-signal analysis techniques, including determining voltage gain, input/output impedance, and frequency response using small-signal models. This knowledge will enable students to effectively analyze, design, and troubleshoot electronic circuits involving transistors, enhancing their understanding and practical skills in transistor circuitry. This will be achieved through classes, interactive tutorials, and by considering the type of simple experiments involving some interesting sampling activities for the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	90	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	35	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	6, 11	LO #1, 3, 4, 9, and 12
	<b>Assignments</b>	2	8% (8)	7, 12	LO # 2, 5, 6 and 11
	<b>Projects / Lab.</b>	1	15% (15)	14	LO #1,3,4,9 and 12
	<b>Report</b>	1	7% (7)	13	LO # 1,3,4,5,9,12 and 13
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to transistor circuits: Different DC circuit biasing for CB, CE & CC;
<b>Week 2</b>	Small signal analysis and design: small signal equivalent circuit for CB; CB Input/Output resistance; calculation of current and voltage gain;
<b>Week 3</b>	CE configuration Input/Output resistance; calculation of current and voltage gain;
<b>Week 4</b>	CB configuration Input/Output resistance; calculation of current and voltage gain;
<b>Week 5</b>	DC Load line; Operating point; AC load line; Graphical Analysis for voltage gain;
<b>Week 6</b>	Two port networks; Hybrid parameters to analyze transistor circuits;
<b>Week 7</b>	Two port networks; Hybrid parameters to analyze transistor circuits;
<b>Week 8</b>	Darlington Pair analysis and its equivalent circuit;
<b>Week 9</b>	<b>Mid-term Exam + Source Transformations</b>
<b>Week 10</b>	Frequency response: Definition and Concepts; Gain in decibel; The effect of the Coupling capacitor.
<b>Week 11</b>	Low cut-off frequency analysis due to the R-C Coupled amplifier in BJTs;
<b>Week 12</b>	High frequency behavior of CB; High cut-off frequency; Gain Band-Width products.
<b>Week 13</b>	FET transistor: Introduction to the theory and operations of FET Transistor; configurations
<b>Week 14</b>	FET Transistors transfer characteristics. Transistor biasing circuit.
<b>Week 15</b>	Small signal analysis of FET transistor. Common source circuit. Common gate and Common Drain circuit.
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1-2</b>	Lab 1: Bipolar Junction Transistor Characteristics Circuit
<b>Week 3-4</b>	Lab 2: Common Emitter Biasing Circuit
<b>Week 5-6</b>	Lab 3: Common Collector & Common Base Amplifier Circuits
<b>Week 7-8</b>	Lab 4: Transistor as a Switch & Device Driver
<b>Week 9-10</b>	Lab 5: Darlington Pair Circuit
<b>Week 11-12</b>	Lab 6: FET Characteristics
<b>Week 13-14</b>	Lab 7: JFET Amplifiers (CS and CD)

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Electronic device and circuit theory 11th edition By ROBERT BOYLESTAD and LOUIS NASHIELSKY	Yes
<b>Recommended Texts</b>	Microelectronic Circuits (The Oxford Series in Electrical and Computer Engineering) 4th Edition by Adel S. Sedra, Kenneth C. Smith	No
<b>Websites</b>	<a href="https://www.nesoacademy.org/ee/04-analog-electronics">https://www.nesoacademy.org/ee/04-analog-electronics</a>	

## Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION OF Object Oriented Programming

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Object Oriented Programming</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	NVEECI211		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	3
Administering Department	Dept. of Computer and Information	College	College of Electronic Engineering
Module Leader	Yahya Saud Idham	e-mail	Yahya.idham@uoninevah.edu.iq
Module Leader's Acad. Title	Ass. Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Majid Derar	e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEECI21	Semester	2
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To teach the student the concepts of object oriented and procedure programming</li><li>2. To differentiate between functions, classes and objects</li><li>3. To learn to overload functions and operators</li><li>4. To design applications using dynamic memory management techniques</li><li>5. To teach the student to implement generic programming and exception handling</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Describe OOPs concepts</li><li>2. Use functions and pointers in your C++ program</li><li>3. Understand tokens, expressions, and control structures</li><li>4. Explain arrays and strings and create programs using them</li><li>5. Describe and use constructors and destructors</li><li>6. Understand friend functions.</li><li>7. Using Operators Overloading.</li><li>8. Understand dynamic memory management techniques</li><li>9. Applying Inheritance</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ul style="list-style-type: none"><li>• Indicative content includes the following.</li><li>• OOP Overview – object-oriented programming principles and techniques. [8 hr]</li><li>• Classes, private, public, constructors, destructors, member data, member functions, inline function.[8 hrs]</li><li>• Operator Overloading, Functions Overloading.[4 hrs]</li><li>• Dynamic memory management, new and delete operators, object copying,[4 hrs]</li><li>• Inheritance: Class hierarchy, derived classes, single inheritance, multiple, multilevel[4hrs]</li></ul>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be focus on developing a conceptual understanding of fundamental principles of OOP, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and by considering the type of simple experiments involving some interesting sampling activities for the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	60	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	40	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.7
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	15% (15)	6, 9, 12	LO #2, 5, 6, 7,8 and 9
	<b>Assignments</b>	5	5% (5)	3,5,7,13,11	LO # 2, 5, 6, 7,8 and 9
	<b>Projects / Lab.</b>	1	15% (15)	14	LO#1,2,3,4,5,6,7,8 and 9
	<b>Report</b>	1	5% (5)	10	LO # 1-7
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-6
	<b>Final Exam</b>	3 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview of C and C++.
Week 2	Pointers.
Week 3	String.h and math.h
Week 4	Files
Week 5	Object Oriented Programming Overview and Classes
Week 6	Inline Functions
Week 7	Constructor and Destructors
Week 8	Friend Functions
Week 9	Mid Term Exam
Week 10	Functions Overloading
Week 11	Operators Overloading
Week 12	Array of Objects
Week 13	C++'s Dynamic Allocation Operators
Week 14	Inheritance
Week 15	Inheritance
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1-2	Lab 1: Pointers And Strings
Week 3-4	Lab 2: Files
Week 5-6	Lab 3: Classes
Week 7-8	Lab 4: Constructor and Destructors
Week 9-10	Lab 5: Friend Functions
Week 11-12	Lab 6: Functions and Operators Overloading
Week 13-14	Lab 7: Memory allocations and Inheritance

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Herbert Schildt, "The complete Reference of C++", 3rd ed.	No
Recommended Texts	Robert Lafore, "Object Oriented Programing"	No
Websites	<a href="https://sites.google.com/uoninevah.edu.iq/yahyasidham/home">https://sites.google.com/uoninevah.edu.iq/yahyasidham/home</a>	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
<p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p>				

# MODULE DESCRIPTION OF DIGITAL DESIGN I

## وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Digital Design I</b>		Module Delivery
Module Type	<b>Core</b>		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>NVEECI212</b>		
ECTS Credits	<b>5</b>		
SWL (hr/sem)	<b>125</b>		
Module Level	<b>2</b>	Semester of Delivery	
Administering Department	Dept. of Computer and Information	College	College of Electronic Engineering
Module Leader	Mohammed H. Al-Jammas	e-mail	<a href="mailto:mohammed.aljammas@uoninevah.edu.iq">mohammed.aljammas@uoninevah.edu.iq</a>
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	Ph.D
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Sedki Baker	e-mail	<a href="mailto:sedki.thanoon@uoninevah.edu.iq">sedki.thanoon@uoninevah.edu.iq</a>
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NVEE217	Semester	2
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To minimize 5-variables functions by K-Map minimization.</li> <li>2. Minimize Boolean function use (tabular method).</li> <li>3. Basic subject of VHDL.</li> <li>4. Minimize function use (Entered Variable).</li> <li>5. Design a Logic Circuits with SSI.</li> <li>6. Implement function use MSI (Decoders, Multiplexers).</li> <li>7. Introduction to PLD (ROM, PLA, PAL).</li> <li>8. Design Arithmetic Logic Unit (ALU)</li> <li>9. Study the effect of Hazard.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Simplify the Boolean functions.</li> <li>2. Learn new methods for minimization.</li> <li>3. Understand the effects of minterms and dontcares.</li> <li>4. Understand the implements function in SOP and POS.</li> <li>5. Learn the new hardware language for modeling (VHDL).</li> <li>6. Design the function use available standard gates (SSI)</li> <li>7. Use MSI (Decoders, and Multiplexers) for design functions.</li> <li>8. Learn the different types of PLD (ROM, PLA, PAL).</li> <li>9. Design the multiple functions by using PLD.</li> <li>10. Design Arithmetic Logic Unit (ALU)</li> <li>11. Learn the effects of Hazard and how can be solve these problems.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p> <ul style="list-style-type: none"> <li>- Minimization Methods – 5 Variables K-Map, Tabular method (Quine-Mcklusky), and Map Entered variables. [18 hrs]</li> <li>- VHDL – Introduction to VHDL and implement a combinational Logic Circuit. [6 hrs]</li> <li>- SSI, MSI – Implement and design the Boolean functions [6 hrs]</li> <li>- PLD – ROM, PLA, and PAL [6 hrs]</li> <li>- Arithmetic Logic Unit (ALU) [3 hrs]</li> <li>- Solve Hazard – [3 hrs]</li> </ul>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be focus on developing a conceptual understanding of fundamental principles such as voltage, current, resistance, and circuit analysis techniques., while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering the type of simple experiments involving some interesting sampling activities for the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	74	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	Quizzes	3	15% (10)	3, 8, 12	LO #1, 3, 7, and 10
	Assignments	5	5% (10)	2, 4, 7, 10, 12	LO # 2, 4, 6, 8, and 9
	Projects / Lab.	4	15% (10)	14	
	Report	1	5% (10)	11	LO # 5
<b>Summative assessment</b>	Midterm Exam	2 hrs	10% (10)	9	LO # 1-6
	Final Exam	3 hrs	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Five Variables Minimization
Week 2	Additional Minimization Techniques (Tabular Quine-Mcklusky)
Week 3	Additional Minimization Techniques (Tabular Quine-Mcklusky)
Week 4	Introduction to VHDL
Week 5	VHDL
Week 6	Entered Variables
Week 7	Logic Design using SSI Chips
Week 8	Logic Design using MSI Chips (Multiplexer)
Week 9	Mid-term Exam
Week 10	Logic Design using MSI Chips (Decoders)
Week 11	Logic Design using ROM
Week 12	Logic Design using PLA
Week 13	Logic Design using PAL
Week 14	Arithmetic Logic Unit (ALU)
Week 15	Logic Hazards
Week 16	Preparatory week before the final Exam



## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Implements a Combinational Logic Circuit (Full Adder, Full Subtractor)
<b>Week 2</b>	Lab 2: Implements a Combinational Logic Circuit (Minimize 5 variables function in SOP, POS)
<b>Week 3</b>	Lab 3: VHDL (Half Adder, Full Adder)
<b>Week 4</b>	Lab 4: Encoder Circuit
<b>Week 5</b>	Lab 5: Decoder Circuit
<b>Week 6</b>	Lab 6: Multiplexer and Type 1 Multiplexer
<b>Week 7</b>	Lab 7: Memory Circuit
<b>Week 8</b>	Lab 8: ALU
<b>Week 9</b>	Lab 9: VHDL (Multiplexer and DeMultiplexer)
<b>Week 10</b>	Lab 10: VHDL (Encoder and Decoder)

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Digital Fundamentals, Thomas L. Floyd, 11 ed., 2015 Digital Logic with VHDL Design, Stephen Brown, 2 <sup>nd</sup> , 2005	Yes
<b>Recommended Texts</b>	Digital Design, M. Morris Mano Introduction to Logic Design, Alan B. Marcovic, 2002	No
<b>Websites</b>	<a href="https://www.coursera.org/learn/digital-systems">https://www.coursera.org/learn/digital-systems</a>	

## Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p style="text-align: center;"><b>Module Aims</b></p> <p style="text-align: center;">أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To develop problem-solving skills and an understanding of circuit theory through the application of techniques.</li> <li>2. To understand transport phenomena in semiconductors, doping, n-type, and p-type semiconductors, mass action law.</li> <li>3. This course deals with the basic concept of electronic circuits.</li> <li>4. To understand junction diode (PN) characteristics, types, and their applications in circuit analysis.</li> <li>5. To perform diode as half wave rectifier, full wave rectifier, center tapped full wave, full bridge rectifier.</li> <li>6. To perform diode clipping, clamping circuits, and diode logic gates.</li> <li>7. Understanding bipolar transistor characteristics, types, current and voltage analysis.</li> </ol>
<p style="text-align: center;"><b>Module Learning Outcomes</b></p> <p style="text-align: center;">مخرجات التعلم للمادة الدراسية</p>	<p>On completion of this module students are expected to:</p> <ol style="list-style-type: none"> <li>1. Know, understand, and be able to state the basic concepts of semiconductor devices.</li> <li>2. Describe the operation of a p-n junction.</li> <li>3. Draw diagrams and explain the operation of diodes.</li> <li>4. Understand and be able to apply physics and electronics concepts.</li> <li>5. Possess skills relevant to physics and electronics, e.g. experimental design and experimental technique.</li> <li>6. Be able to demonstrate skills in mathematical analysis and problem-solving.</li> <li>7. Analyze and design basic circuits for transistors.</li> <li>8. Be sufficiently prepared for undertaking the module Electronics II.</li> </ol>
<p style="text-align: center;"><b>Indicative Contents</b></p> <p style="text-align: center;">المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Intrinsic and extrinsic semiconductors, doping, n-type, P-type semiconductors, mass action law, electrical properties of the semiconductors. [12hrs]</p> <p>PN Junction characteristics, PN junction Bias, The volt-ampere characteristics of the diode, Solving problems about PN junction, Types of diode, Varactor, Schottky, Tunnel, Zener diodes. [16hrs]</p> <p>Diode as half wave and full wave rectifiers, full bridge rectifier, Diode clipping and clamping circuits, diode logic gates. [16hrs]</p> <p>Bipolar Junction Transistor (BJT), BJT Types, Current and voltage analysis of BJT. [12hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

#### Strategies

The main strategy will be to focus on developing a conceptual understanding of fundamental principles such as semiconductor, diode, transistor, and circuit analysis techniques., while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, and by considering the type of simple experiments involving some interesting sampling activities for the students.

## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	88	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	15% (15)	6,9,11	LO # 2 and 4
	<b>Assignments</b>	2	6% (6)	6, 13	LO # 1, 2, 4 and 7
	<b>Projects / Lab.</b>	1	15% (15)	continuous	
	<b>Report</b>	1	4% ( 4)	12	LO # 3 and 4
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-5
	<b>Final Exam</b>	2hr	50% (50)	15	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Energy Bands in Solids
Week 2	Introduction to transport phenomena in semiconductors.
Week 3	Intrinsic semiconductor and extrinsic semiconductor, doping, n-type semiconductor.
Week 4	P-type semiconductor, mass action law, electrical properties in semiconductor.
Week 5	Junction diode characteristics, PN junction.
Week 6	PN junction Bias, The volt-ampere characteristics of the diode.
Week 7	Diode models, Diode as rectifier, half wave rectifier.
Week 8	<b>Mid-term Exam.</b>
Week 9	half wave rectifier with transformer coupled, full wave bridge rectifier.
Week 10	Diode clipping circuits, positive clipper, negative clipper.
Week 11	Diode clampers, diode logic gates, , types of diode.
Week 12	Bipolar Junction Transistor (BJT), BJT Types.
Week 13	Current and voltage analysis of BJT.
Week 14	<b>The preparatory week before the Final Exam.</b>
Week 15	<b>The Final Exam.</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1-2	Lab 1: Introduction to basic principles.
Week 3-4	Lab 2: Half-wave Rectifier circuit.
Week 5-6	Lab 3: Full-wave Rectifier circuit.
Week 7-8	Lab 4: Full-wave Rectifier circuit with a filter capacitor.
Week 9-10	Lab 5: Diode Clipping circuits.
Week 11-12	Lab 6: Diode Clamping circuits.
Week 13-14	Lab 7: Diode equivalent circuit for the AND gate and OR gate.

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Integrated Electronics - Jacob Millman and Christos Hallkias	No
<b>Recommended Texts</b>	Electronic Devices and Circuit Theory- Robert L. Boylestad, Louis Nashelsky.	Yes
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week#	Material Covered
Week 1-2	Lab 1: Introduction to C Programming: Declare variables and constants and (Hello world!) program
Week 3-4	Lab 2: Standard input/output head <stdio.h> including printf and scanf standard functions
Week 5-6	Lab 3: Arithmetic, logical, and bitwise operators
Week 7-8	Lab 4: Math header for math functions <math.h>
Week 9-10	Lab 5: Assignment and increment & decrement operators
Week 11-12	Lab 6: Relational and conditional operators
Week 13-14	Lab 7: Loop operators

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C Programming Absolute Beginner's Guide, 3rd Edition 2014. BY: Greg Perry and Dean Miller.	No
Recommended Texts	C How to Program with an introduction to C++, 8 <sup>th</sup> Edition 2016. BY: Paul Deitel and Harvey Deitel. Global Edition contribution by Piyali Sengupta	No
Websites	1- <a href="https://www.programiz.com/c-programming">https://www.programiz.com/c-programming</a> 2- <a href="https://www.coursera.org/specializations/c-programming">https://www.coursera.org/specializations/c-programming</a>	

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