Ninevah University

جامعة نينوى

First Cycle – Bachelor's degree (B.Sc.) – Electronic Engineering

بكالوريوس علوم - هندسة الالكترونيك

Table of Contents | جدول المحتويات

1. Mission & Vision Statement

Vision Statement

Our program envisions graduates who are well-equipped to address complex challenges in the field of electronics, especially in the field of electronics engineering. They will possess strong analytical and problem-solving abilities, along with the creativity to design innovative solutions for industrial electronics and medical device electronics. We are committed to nurturing a culture of research and innovation, encouraging our students to push the boundaries of knowledge and contribute to advancements in electronics engineering. Through collaborations with industry partners and academic institutions, we aim to provide opportunities for interdisciplinary research and technology transfer, ensuring our graduates are at the forefront of industry developments. Through our commitment to excellence, innovation, and ethical engineering practices, we aspire to be recognized as a leader in Electronics Engineering education, producing graduates who are sought-after by industry, academia, and research institutions worldwide.

Mission Statement

Our mission is to provide a rigorous and comprehensive education in Electronics Engineering, equipping students with the knowledge, skills, and ethical values necessary to excel in the rapidly developing field of electronics engineering and technologies. Our program emphasizes the mastery of core principles in areas such as signal processing, micro-electronics, electronic devices, and emerging technologies. We strive to equip our students with a strong foundation that enables them to analyze, design, and optimize electronic systems to meet the demands of the industrial age. Our mission is to produce graduates who are not only technically proficient in electronic engineering but also possess the ability to think critically, solve complex problems, and contribute meaningfully to the advancement of medical devices, industrial electronics and technologies. By upholding high academic standards, promoting a culture of excellence, and fostering a supportive and inclusive learning environment, we aim to be recognized as a distinct program in Electronic Engineering, producing skilled professionals who are in demand by industry, academia, and research institutions worldwide.

2. Program Specification

Programme code:	BSc-CM	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

Recognizing the significant influence of electronics in our everyday lives, it became crucial to adapt and provide education that outfits to the evolving landscape. As a result, the College of Electronics Engineering took the initiative in 2002 to establish a specialized undergraduate program in Ninevah province specifically focused on electronics engineering. This program was carefully designed to train students with a comprehensive understanding of various subjects that form the foundation of knowledge in this rapidly progressing field. By offering a diverse range of courses, the program aims to prepare students for the dynamic challenges and opportunities brought forth by the modern era of electronics.

The program follows a structured curriculum, with Level 1 serving as an introduction to the fundamentals of electronics engineering, providing a solid basis for progressing into specialized topics within the field. Programme-specific core subjects are covered at Level 2, laying the groundwork for more specialized modules at Levels 3 and 4. Additionally, the program incorporates a sufficient number of modules dedicated to general knowledge, science, and mathematics. At Levels 3 and 4, students are exposed to a wide range of modules that are specifically tailored to strengthen their understanding of industrial and medical devices engineering and applications. These modules ensure that graduates with a degree in electronics engineering possess the breadth of knowledge expected of them. Learning outcomes from these modules enable students to acquire the necessary skills to understand, analyze, and design processing elements at different stage of electronics systems. These stages include comprehensive modules as signals and systems, digital signal processing, computer programming and microprocessor design for electronics purposes, analogue and digital circuits. Moreover, there are numerous advance modules for various types of electronics distributed in the courses such as electromagnetic fields, power electronics and devices, electronics communication, radiation and preparation theories, medical devices, etc. The program adopts a research-oriented ethos from the outset, integrating practical within lecture modules or dedicated practical modules, as well as facilitating research seminars and tutorials. Moreover, at Level 4, students undertake a capstone research project under the guidance of a supervisor who monitors their progress throughout the process. Furthermore, the program offers opportunities for summer training, internships, and industrial placements. Individual needs and preferences are discussed with the appropriate tutors, and accommodations are made whenever possible to ensure a fulfilling and well-rounded educational experience.

3. Program Goals

The following program goals are designed to equip students with a strong technical foundation, practical skills, ethical values, and a holistic understanding of electronics engineering. They prepare graduates for successful careers in various sectors, including medical devices, industrial electronics, power electronics, and cutting-edge advancements.

1. Develop Technical Proficiency: Provide students with a strong foundation in the principles and theories of electronics engineering, including signal processing, data transmission, laser and fiber application, microwave propagation, micro-electronics, and emerging technologies. Develop technical skills necessary for the design, analysis, and optimization of electronics systems.

2. Enhance Design and Implementation Skills: Equip students with the knowledge and skills to design, implement, and evaluate electronics systems. Develop proficiency in utilizing software tools, simulation techniques, and laboratory experiments to validate and optimize system performance.

3. Foster Effective Communication: Enhance students' oral and written communication skills to effectively convey technical information and ideas. Develop the ability to collaborate in student work teams, present technical concepts, and prepare professional reports and documentation.

4. Encourage Research and Innovation: Promote a culture of research and innovation by providing opportunities for undergraduate research, encouraging involvement in industry projects, and supporting collaboration with faculty and industry partners. Develop critical thinking and research skills to address emerging challenges in communication engineering.

4. Student Learning Outcomes

The field of electronics engineering focuses on the study of the organization and operation of medical devices and industrial systems at various levels, including design, analysis the signal processing of these systems. Graduates gain comprehensive knowledge of the various aspects of electronics systems and apply fundamental principles and theory to address broader concepts. The Electronics Engineering department offers a Bachelor of Science program in Electronics Engineering (with two branch: industrial electronics and medical devices engineering) through providing courses with wide range of spectrum to deliver a comprehensive education in the field of electronics engineering. The curriculum and experiences in the department are designed to prepare students, in part, for entry into professional programs in technology and engineering, pursue advanced studies, embark on technical careers, and engage in education.

1. Proficiency in fundamental concepts: Demonstrate a strong knowledge of fundamental principles and core concepts in electronics engineering, including signal processing, power electronics, and medical instrumentations in addition to understand the theoretical concepts of various electronics systems.
2. Problem-solving skills: Develop the ability to analyze problems related to different type of electronics systems, and apply critical thinking and problem-solving techniques to design, implement, and evaluate efficient and innovative solutions.
3. Technical competency: Acquire practical skills and proficiency in utilizing various equipment and instruments in the electronics laboratories. These tools include specialist electronics circuits, control systems and power electronics. Moreover, these are different available software's that support the practical experiments such as Matlab, C++, and advanced design system software's.
4. Collaboration and teamwork: Demonstrate effective teamwork and collaboration skills by actively participating in group seminars and projects, engaging in team-based and collaborative

problem-solving activities, and effectively communicating with peers working in an interdisciplinary project.

5. Communication skills: Develop strong written and oral communication skills to effectively convey technical concepts, ideas, and solutions in a clear and formal manner to both technical and non-technical audiences, including presenting research findings, documenting communication systems, and preparing comprehensive technical reports.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

Ninevah University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

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:				
Number 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.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   CGPA of a 4-year B.Sc. degree:

   CGPA = [(1st ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

7. Modules

Module Information		
Module Title	**D.C Circuits Analysis**	**Module Delivery**
Module Type	**Base**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical**
Module Code	NVEE215	
ECTS Credits	5	
SWL (hr/sem)	125	

		☐ **Seminar**	
Module Level	1	**Semester of Delivery**	1
Administering Department		**College**	
Module Leader	Zahraa Siddiq Yahya	**e-mail**	
Module Leader's Acad. Title	Lecturer assistant	**Module Leader's Qualification**	
Module Tutor	Zahraa Siddiq Yahya	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module		**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. To identify the basic concepts of DC Electrical Eng. circuits. 2. To understand how is the calculation of current, voltage, and power. 3. To understand and cover the basic DC circuit analysis methods and theorems.
Module Learning Outcomes	1. Explain the function of each element in DC Electrical circuits. 2. Use the basic circuit analysis methods and theorems to simplified the DC Electrical circuits. 3. Explain the different between transformation methods. 4. Applying the appropriate analysis method to reach the aim in its simplest form.

Indicative Contents	Indicative content includes the following. Part A – BASIC CONCEPTS: Voltage & current; Power & Energy; Dependent and Independent sources; Ohm's laws series & parallel connections; Delta- star connections and transformations. [15 hrs] Part B - D.C. Network Theorems: Source transformation; Linearity & superposition; Thevenin's & Norton's Theorems; Source transportation; source superposition; Nodal analysis; Mesh analysis. [35 hrs]

Learning and Teaching Strategies	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
Structured SWL (h/sem)ل	30	**Structured SWL (h/w)**	4

Unstructured SWL (h/sem)	30	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	**60**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	[3,6,9,12]	LO (#1- #12)
	Assignments	1	10% (10)	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11
Summative assessment	**Midterm Exam**	1.5 hr	10% (10)	10	LO #(1-8)
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Voltage & current
Week 2	Power & Energy
Week 3	Dependent and Independent sources
Week 4	Ohm's laws
Week 5	series & parallel connections
Week 6	Delta- star connections and transformations
Week 7	Kirchhoff's Current & Voltage Laws (KCL), (KVL)
Week 8	Source transformation
Week 9	Linearity & superposition
Week 10	Nodal analysis
Week 11	Mesh analysis
Week 12	Thevenin's Theorem
Week 13	Norton's Theorem
Week 14	Max. power transfer
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	**" Engineering Circuit Analysis"** By W. Hayt	Yes
Recommended Texts	**"Introductory Circuit Analysis"** By Boylested	Yes

Grading Scheme

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 Information

Module Title	**Computer science**	**Module Delivery**	
Module Type	**Core**		☐ **Theory**
Module Code	**NVEEELM114**		☒ **Lecture**
ECTS Credits	٤		X **Lab**
SWL (hr/sem)	**100**		**Tutorial**
			Practical
			☐ **Seminar**

Module Level	1	**Semester of Delivery**	1
Administering Department	ELM	**College**	NE
Module Leader	Asmaa Nabeel	**e-mail**	**asmaa.khaleel@uoninevah.edu.iq**
Module Leader's Acad. Title	Lecturer Assist	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	4/7/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	**General overview of personal computer architecture** **Computer peripherals, keyboard, screen, mouse, and storage media** **Computer busses, ports, interfaces** **Overview of MSDOS operating system** **MSDOS internal commands** **MSDOS external commands** **Introduction to computer languages** **Overview of windows operating system** **Windows desktop, changing settings, starting programs** **Creating, deleting, copying, moving, searching for files and folders** **Using my computer, my document, and help facility** **Using windows control panel** **Using the windows accessories paint, notepad, word pad, …..etc** **Setup applications to windows, remove applications from windows** **Connecting to the internet, using the windows explorer** **Using the Microsoft Word** **Using the Microsoft Excel** **Using the Matlab**

Module Learning Outcomes	1.Understanding the important components of the computer and its operating system. 2. Understanding the meaning of MSDOS operating system and its commands. 3. Understanding the windows operating system 4. Understanding the Microsoft office (word, power point, excel). 5. Understanding the high and low level languages 6. Learn about how the strings represented in C language. 7. introduction to matlab
Indicative Contents	1. explain the components of computer hardware and software 2.introduction to the types of computers 3. storage media 4. computer ports 5. computer networks and the types of it 6. the internal and external MSDOS commands 7. windows operating system 8. word office program 9.power point office program 10. Excel program 11. Matlab

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)			
Structured SWL (h/sem)	125	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	65	**Unstructured SWL (h/w)**	2
Total SWL (h/sem)	190		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	٢, 4, 5,6	LO #1, 2, 10 and 11
	Assignments	1	10% (10)	14	LO # 3, 4, 6 and 7
	Projects / Lab.	٠	٠	٠	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	١	٢٠	١٤	
Summative assessment	Midterm Exam	١.5hr	30% (20)	10	LO # 1-4
	Final Exam	3hr	50% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	**Introduction to** the part of computers in hardware and software ,computer types, storage media
Week 2	**Explain the computer ports , computer networks**
Week 3	**Introduction to MSDOS operating system and the internal commands of it**
Week 4	**External Ms DOS command , file and folder related commands and the editor**
Week 5	Windows operating system
Week 6	Windows orders(change the background, screen saver, resolution), change the status of files, printing files, copy and save of files, backups, Recycle bin ,compressing files, viruses
Week 7	Microsoft office word (creating new word file, bars , types and styles of fonts, copy and select of texts ,save of word file)

Week 8	MS WORD: spell checking, inserting symbols, add borders, change the document setup , insert table, page numbering, insert equations and effects)
Week 9	MS Power point:(how to design professional presentation, change the layout of presentation and background of it, numbering slides, insert charts , insert table and audio)
Week 10	MS Power point(insert an effect to the object in slide, transition between slides , grouping of objects, insert equation, copy ,save and printing the slides then how to start the presentation)
Week 11	MS EXCEL (getting started with excel, how to create a spreadsheet, copy and rename the work book, entering and deleting of data in sheet, insert and delete of rows& columns, selecting cells, adding border to sheet)
Week 12	MS EXCEL:how to write a formule in sheet, functions, summation of data in row or column ,average function, max& min functions, count& counta, round function, save and print the spread sheet
Week 13	Overview of High &Low level languages
Week 14	**Matlab**
Week 15	
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1-15	The application of each part of the covered drawing subject theoretically and according to the weekly sequence of the curriculum in the AutoCAD laboratory **Note: By two hours a week**

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	1.“**Computer Science”**	No
Recommended Texts	**2.''MATLAB Handbook”**	No

Websites	https://www.tutorialsmate.com/2021/12/parts-of-computer https://www.koenig-solutions.com/matlab-programming	

Grading Scheme				
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 is required, but credit is given.
	F – Fail	راسب	(0-44)	A significant amount of work is 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 Information

معلومات المادة الدراسية					
Module Title	Mathmatics1			**Module Delivery**	
Module Type	Base			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NVEE206**				
ECTS Credits	٦				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Electronic Eng. Dep.		**College**	Electronics Engineering	
Module Leader	Hani M. S. Salman		**e-mail**	hani.mohamed@uoninevah.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	MSc	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**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	
Module Objectives أهداف المادة الدراسية	4. Gain proficiency in differentiating trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function. 5. Master differentiation techniques for various types of functions. 6. To learn how to sketch curves and to deal with the transcendental functions. 7. To increase the skills related to differentiation applications. 8. Develop a strong foundation in Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.

	9. Understand the concept of Application of the definite integral, including finding volumes of revolution, lengths of curves, and surface areas of revolution. 10. To learn the methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. 11. Apply calculus principles to solve real-world engineering problems, developing problem-solving skills and the ability to apply calculus concepts to practical situations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the concept of differentiation as a rate of change and slope of the curve. 2. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. 3. Learn the applications of differentiation. 4. Solve Maximum and Minimum problems. 5. Learn how to Plot the Curve. 6. Learn Transcendental functions: graphs, and derivative. 7. Understand the concept of integration: types of integrals. definite integrals, infinite Integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function. 8. Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. 9. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. 10. Develop critical thinking and problem-solving skills by applying calculus.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Differentiation:</u> Definitions and notations, basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions: . Applications of differentiation – slope tangents and normal, rate of change, velocity and acceleration, maxima and minima and inflexion points, and Curve plotting. [16 hrs] Transcendental Functions – definitions, properties, graphs, derivative. [4 hrs] <u>Part B – Integration:</u>

	Definitions and notations, types of integrals: definite integrals, infinite Integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function. [12 hrs] Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution. [12 hrs] Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. [16 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's major aim is to foster student engagement, improve critical thinking abilities, and promote collaborative learning. Interactive seminars, interesting tutorials, and exercises encourage active participation, allowing students to hone their critical thinking skills and apply engineering mathematics principles to problem solving. Furthermore, students collaborate on engineering mathematics issues, examine real-world scenarios, and explore the practical applications of the principles acquired through group activities, projects, and conversations. This method not only increases students' comprehension of engineering mathematical concepts, but it also fosters cooperation, communication, and key interpersonal skills that will be useful in their future engineering activities.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	30% (30)	5 and 10	LO #1 #2 #3 and #4, #7, #8
	Assignments	1	10% (10)	12	LO #7 - #9
	Projects / Lab.	-	-	-	-
	Report	-	-	-	-
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – Differentiation definitions and notations, review of basic differentiation rules, chain rule, and Implicit differentiation.
Week 2	Partial differentiation and higher order differentiation.
Week 3	Differentiation of trigonometric functions and Hyperbolic Functions. Applications of differentiation; slope, tangents and normal.
Week 4	Rate of change, velocity and acceleration, maxima and minima, inflexion points and Curve plotting
Week 5	Transcendental Functions – definitions, properties, and graphs, derivative.
Week 6	Definitions and notations of integration, Types of integrals: definite integrals and infinite integrals. Integration of trigonometric function.

Week 7	Integration of inverse trigonometric function, hyperbolic function. Mid-term Exam
Week 8	Integration of inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.
Week 9	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution.
Week 10	
Week 11	
Week 12	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	G. B. Thomas Jr., M. D. Weir, J. Hass, and F. R. Giordano, "Thomas' Calculus," 12th ed., Pearson, 2019.	Yes
Recommended Texts		
Websites	https://www.coursera.org/learn/introduction-to-calculus#syllabus https://www.edx.org/learn/calculus https://www.khanacademy.org/math/calculus-1	

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 Information		
Module Title	**Physical Electronics**	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial**
Module Code	NVEE218	
ECTS Credits	6	

SWL (hr/sem)	150			☐ **Practical** ☐ **Seminar**	
Module Level		1	**Semester of Delivery**		1
Administering Department		Electronic	**College**	Ninevah university	
Module Leader	Hamsa Fawaz Thanoon		**e-mail**	hamsa.thanoon@uoninevah.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date		04/07/2023	**Version Number**		1.0

Relation with other Modules

Prerequisite module		**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. To develop problem solving skills and understanding of Atomic Structure 2. To understand Energy band structure of metal, insulator, and semiconductor.

	3. To understand Properties of intrinsic P and N type semiconductors. 4. To understand Electrical conduction in intrinsic semiconductor. 5. To understand Properties of extrinsic semiconductors. 6. To understand Electrical conduction in extrinsic semiconductor
Module Learning Outcomes	1. Recognize how semiconductors works in electronics circuits. 2. List the various terms associated with electronics circuits. 3. Summarize what is meant by a basic of semiconductors. 4. Discuss the reaction and involvement of semiconductors in generate the currents. 5. Describe mobility of electrons and conductivity in metals. 6. Define Ohm's law. 7. Identify the pure semiconductors. 8. Identify the impure semiconductors 9. Discuss the impure semiconductors N and P types 10. Explain the type of electronic emission.
Indicative Contents	Indicative content includes the following. <u>Part A - Energy Bands in Solids</u> <u>Describe the structure of an atom ◆ Discuss insulators, conductors, and semiconductors and how they differ. [9 hrs]</u> <u>Revision problem classes [3 hrs]</u> <u>Part B - Transport Phenomena in Semiconductor</u> <u>Describe how current is produced in a semiconductor ◆ Describe the properties of n-type and p-type semiconductors. [30 hrs]</u>

Learning and Teaching Strategies	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL)			
Structured SWL (h/sem)	111	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	65	**Unstructured SWL (h/w)**	2
Total SWL (h/sem)	**176**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	10	[2,4,5,6]	LO (#1- #12)
	Assignments	2	10	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11

Summative assessment	**Midterm Exam**	1.5 hr	20% (20)	10	LO #(1-8)
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Energy Bands in Solids
Week 2	Fermi-Dirac distribution function
Week 3	Properties of intrinsic P and N type semiconductors
Week 4	Mobility and conductivity
Week 5	Electrical conduction in intrinsic semiconductor
Week 6	Hall Effect
Week 7	Generation and recombination of charges
Week 8	Diffusion current continuity equation
Week 9	Injection minority carrier charges

Week 10	N-type semiconductor
Week 11	Solved problems
Week 12	P-type semiconductor
Week 13	Solved problems
Week 14	Photo-conductivity
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1.“NTEGRATEDELECTRONICS"ByMILLMAN&HALKIES	Yes

	2. “SEMICONDUCTOR DEVICES & CIRCUITS" ،JOHN WILEY & SONS	
Recommended Texts	1. (Floyed) 2. ثيراجا فصل ٥١	Yes

Grading Scheme				
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 Information

Module Title	**Mechanical Engineering Principle**	**Module Delivery**	
Module Type	**Base**	☐ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE203		
ECTS Credits	6		
SWL (hr/sem)	**150**		
Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader		**e-mail**	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	2/07/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	Students will be able to: 1. Students will be able to: 2. Knowing the different methods of making calculations related to forces and their effects on two- and three-dimensional systems 3. Clarify that the subject represents a very important introduction to other subjects for the later stages of the student's study and building a scientific base for the student to ensure the possibility of understanding the relevant subjects in the later stages. 4. The student will learn different applications of commonly used Mechanical machinery. 5. The student will learn strong basics of Mechanical Engineering fundamentals.
Module Learning Outcomes	1. Have understood and overcome any misconceptions about basic concepts in physics (force, energy, work etc). 2. Restate existing problem solving skills in a form more suitable for engineering applications. 3. Interpret basic engineering applications of mechanics in more detail. 4. Acquire four basic thinking skills: 1. Perceive, or resolve, contradictions involving their preconceptions about mechanics. 2. Organize the basic ideas of mechanics in a form suitable for problem solving. 3. Apply basic principles in mechanics to realistic engineering situations. 4. Solve realistic engineering problems.
Indicative Contents	**Indicative content includes the following:-** **Statics – Introduction [25 hrs]** ○ Vectors ○ Newton's Laws ○ Fundamental Units ○ Types of force ○ Parallelogram law ○ Resultant forces ○ Moments and couples ○ Moment of couples ○ Eequilibriums ○ Free body diagram ○ Coplanar system ○ Friction: Nature of friction; Theory of friction; Coefficient of friction **Dynamics – Introduction [20 hrs]** ○ Basic concepts ○ Newton's Laws ○ Formulation and solution of problems

	○ Kinematics of Particles ○ Rectilinear motion ○ Curvilinear motion ○ Relative motion ○ Kinetics of Particles ○ Newton's second Law ○ Work and energy -

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)			
Structured SWL (h/sem)	25	**Structured SWL (h/w)**	2
Unstructured SWL (h/sem)	20	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	45		

Module Evaluation				
As	**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**

Formative assessment	**Quizzes**	6	5% (5)	٢, ٥, ٩,12,13,15	LO #1, 2, 10 and 11
	Assignments	6	5% (5)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0%		
	Report	0	0%	0	
Summative assessment	**Midterm Exam**	3hr	30% (30)	10	LO # 1-7
	Final Exam	3hr	60% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Force system; Units system;
Week 2	Parallelogram law; Forces + components
Week 3	Resultant of coplanar forces
Week 4	Components of force in space
Week 5	Moment of a force
Week 6	Moment of a force
Week 7	Moment of a force
Week 8	Free body diagram; Coplanar system
Week 9	Friction: Nature of friction; Theory of friction
Week 10	Coefficient of friction
Week 11	Coefficient of friction
Week 12	Coefficient of friction
Week 13	Normal and tangential components of acceleration
Week 14	Normal and tangential components of acceleration
Week 15	

Week 16	Normal and tangential components of acceleration

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	1. Engineering Mechanics (statics) By: J.L. MERIAM 2. Engineering Mechanics (Dynamics) By: J.L. MERIAM	Yes
Recommended Texts	➢	No
Websites		

Grading Scheme				
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 is required, but credit is given.
	F – Fail	راسب	(0-44)	A significant amount of work is 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 Information
معلومات المادة الدراسية

Module Title	**Democracy and Human Rights**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NV12**		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		

Module Level	1	**Semester of Delivery**	1
Administering Department	Dept. of Electronic	**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

Module Aims أهداف المادة الدراسية	١ – شرح مفهومي حقوق الانسان والديمقراطية ٢ – بيان اهمية حقوق الانسان في حياتنا العامة وعلى جميع الصعد (الدراسية و الوظيفية و الاجتماعية ..الخ) ٣ – بيان اهمية ايجاد مفهوم واعي لمصطلح الديمقراطية ضمن انظمة الحكم وتاثيرها على الاستقرار السياسي ٤ – ضرورة فهم الترابط الوثيق مابين حقوق وبناء مجتمع ديمقراطي يضمن حرية افرادة وضمان مصالحهم

	٥- ضرورة التركيز على ان بناء مفهوم حفيفي 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
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١ – ترسيخ قيم الحرية والمساواة في اسس المشاركة الفعلية في بناء المجتمع ٢ – العمل على بناء بيءة حقيية مستقرة من خلال تطبيق القوانين ضمن مجتمع ديمقراطي ٣ – والسعي لتوفير اسس لحماية الافراد ضمن المجتمعات الديمقراطية
Indicative Contents المحتويات الإرشادية	القسم الأول:- التطور التاريخي لحقوق الإنسان - أولا:- المجتمعات البدائية مرحلة ما قبل التاريخ - الحضارات الشرقية (بلاد وادي الرافدين والحضارة الفرعونية نموذجاً) - نموذجاً - الحضارات الغربية (اليونانية (والرومانية ثانيا:- 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 أولا- التحديد والتعريف الحق في الفقه الإسلامي - الحق في الفقه القانوني -

تعريف حقوق - 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 بالشخصية) - القسم الثالث:– ضمانات احترام وحماية حقوق الإنسان أولا – الضمانات في الشريعة الإسلامية ثانياً:– الضمانات على الصعيد الوطني ثالثا:– 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) أولا:– المقدمة ثانياً:– التعريف بالحريات العامة - الأصل اللغوي - الأصل التاريخي - الأساس القانوني - الأساس الشرعي ثالثا:– أسس الحريات العامة - العدالة - المساواة	

	- الحرية رابعاً:- الحريات العامة الو صفية - حرية الرأي - حرية الفكر - حرية الأعلام - المسا واه خامساً:- الشريعة الإسلامية والحريات العامة - موقف الإسلام من المرأة (الميراث, الزواج, تولي الوظائف) - موقف الإسلام من حرية العقيدة نظم إدارة الدولة أولا:- في تحديد النظم السياسية - فكره النظام السياسي - شرعية النظم السياسية - أنواع النظم السياسية ثانياً:- في النظام الديمقراطي - مقدمة تأصيلية - تعريف الديمقراطية - أركان ومرتكزات النظام الديمقراطي ثالثاً:- نماذج الديمقراطية - الديمقراطية المباشرة

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	اتباع طريقة التعليم المباشر من خلال عرض المادة وشرحها والاستعانة بالادوات التعليمية لشرحها من خلال توضيح اليات المفهوم العلمي لمصطلحي الديمقراطية و حقوق الانسان

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

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

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
	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.

Courses specification for first class (Second Course)

Module Information					
Module Title	**Digital Techniques**			**Module Delivery**	
Module Type	**Base**			☒ **Theory**	
Module Code	**NVEE217**			☒ **Lecture**	
ECTS Credits	**5**			☐ **Lab**	
SWL (hr/sem)	**125**			☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Level		1	**Semester of Delivery**		2
Administering Department			**College**	Type College Code	
Module Leader	(Younis Saber Othman), (Noor Alhuda Saad Abbas)		**e-mail**		
Module Leader's Acad. Title		Lecturer Assistant	**Module Leader's Qualification**		M.Sc.
Module Tutor			**e-mail**		

Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	4/7/2023	**Version Number**	1.0

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1. To learn new number systems and how to convert between them 2. To identify and learn the logic gates and Boolean algebra 3. How to minimize the Boolean functions using Boolean algebra and Karnaugh maps 4. To understand, draw, and identify the combinational logic circuits using the discrete logic 5. To understand, draw, and identify the combinational logic circuits using the MSI integrated circuits 6. To use the 3-varaiables and 4-varaiables Karnaugh map for Boolean minimization
Module Learning Outcomes	Students will be able to: 1. Learning new number systems and how to convert between them 2. Identify the logic gates and learn the Boolean algebra 3. Minimize the Boolean functions 4. Understand, draw, and identify the combinational logic circuits using the discrete logic and MSI integrated circuits 5. Identify and use the 3-varaiables and 4-varaiables Karnaugh map
Indicative Contents	**Indicative content includes the following:-** **NUMBER SYSTEMS:- [10 Hrs]** Decimal number system; Binary; Octal and hexadecimal number systems; Conversion from one number to another number system; Addition; Subtraction; Multiplication and division using different number system; Representation of binary number insignia-magnitude; Sign 1's Complement and align 2's complement notation; Rules for addition and subtraction with complement Representation; BCD; EBCDIC; ASCII; Extended ASCII; Gray and other codes. **LOGIC GATES AND BOOLEAN ALGEBRA:- [10 Hrs]** 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 only NAND and NOR gates. **BOOLEAN FUNCTION MINIMIZATION:- [10 Hrs]** Objectives of the minimization procedures; Karnaugh map method; The 3-Variable Karnaugh Map; The 4-Variable Karnaugh Map; Karnaugh Map SOP Minimization; Don't

	care conditions; Karnaugh Map POS Minimization; Converting Between POS and SOP Using the Karnaugh Map. **COMBINATIONAL LOGIC CIRCUITS USING DISCRETE LOGIC GATES:- [5 Hrs]** Parity generator and checker; Code converters; Majority circuits; magnitude comparator. **COMBINATIONAL LOGIC CIRCUIT USING MSI INTEGRATED CIRCUITS:- [10 Hrs]** Encoder; priority encoder; decoder; Multiplexer and demultiplexer circuits; Implementation of Boolean functions using decoder and Multiplexer; BCD to 7-segment decoder; Common anode and common cathode 7-segment displays; Random access memory; Read only memory and erasable programmable ROMS

Learning and Teaching Strategies

Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)	45	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	45	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	90		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	1-14	LO #1-14
	Assignments	1	5% (5)	6	LO # 1-6
	Projects / Lab.	10 Lab	10% (10)	5-14	LO # 5-14
	Report	3	5% (5)	5-14	LO # 5-14
Summative assessment	Midterm Exam	1.5hr	20% (20)	10	LO # 1-10
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	**NUMBER SYSTEMS:-** Decimal number system; Binary; Octal and hexadecimal number systems; Conversion from one number to another number system; Addition; Subtraction; Multiplication and division using different number system; Representation of binary number insignia-magnitude; Sign 1's Complement and align 2's complement notation; Rules for addition and subtraction with complement Representation; BCD; EBCDIC; ASCII; Extended ASCII; Gray and other codes.
Week 2	
Week 3	
Week 4	**LOGIC GATES AND BOOLEAN ALGEBRA:-** 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 only NAND and NOR gates.
Week 5	
Week 6	
Week 7	**BOOLEAN FUNCTION MINIMIZATION:-** Objectives of the minimization procedures; Karnaugh map method; The 3-Variable Karnaugh Map; The 4-Variable Karnaugh Map; Karnaugh Map SOP Minimization; Don't care conditions; Karnaugh Map POS Minimization; Converting Between POS and SOP Using the Karnaugh Map.
Week 8	
Week 9	
Week 10	
Week 11	**COMBINATIONAL LOGIC CIRCUITS USING DISCRETE LOGIC GATES:-**
Week 12	Parity generator and checker; Code converters; Majority circuits; magnitude comparator.

Week 13	**COMBINATIONAL LOGIC CIRCUIT USING MSI INTEGRATED CIRCUITS:-** Encoder; priority encoder; decoder; Multiplexer and demultiplexer circuits; Implementation of Boolean functions using decoder and Multiplexer; BCD to 7-segment decoder; Common anode and common cathode 7-segment displays; Random access memory; Read only memory and erasable programmable ROMS
Week 14	
Week 15	
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 5-14	Introduction to KL-31001 DIGITAL LOGIC LAB Exp. 1: Logic Gates Exp. 2: NAND, NOR, XOR Gates Exp. 3: AND-OR-INVERTER(A-O-I) Circuits Exp. 4: Bit Parity Generator Circuits Exp. 5: Comparator Circuits Exp. 6: Decoder Exp. 7: Encoder Exp. 8: Multiplexer Exp. 9: Demultiplexer

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	**Digital Fundamentals** | Eleventh Edition Global Edition | by Thomas L. Floyd | Pearson Education 2015	PDF
Recommended Texts	**Logic and Computer Design Fundamentals** | Fifth Edition Global Edition | by Morris Mano • Charles R. Kime • Tom Martin | Pearson Education 2016	PDF

Websites	(Telegram Group and Google classroom)	

Grading Scheme				
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 is required, but credit is given.
	F – Fail	راسب	(0-44)	A significant amount of work is 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 Information

Module Title	**A.C circuits Analysis**	**Module Delivery**	
Module Type	**Base**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE216		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Zahraa Siddiq Yahya	**e-mail**	
Module Leader's Acad. Title	Lecturer assistant	**Module Leader's Qualification**	
Module Tutor	Zahraa Siddiq Yahya	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module		**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	12. To identify the basic concepts of energy storage elements. 13. To identify the basic of Alternating Current AC. 14. To understand and cover the basic AC circuit analysis methods and theorems.
Module Learning Outcomes	11. Explain the function of each element in AC Electrical circuits. 12. Use the basic circuit analysis methods to simplified the AC Electrical circuits. 13. Applying the appropriate analysis method to reach the aim in its simplest form.
Indicative Contents	Indicative content includes the following. <u>Part A – energy storage elements:</u> The capacitor; The Inductor; Analysis of RC-transient circuits; Analysis of RL-transient circuits; RLC transient circuits. [15 hrs] <u>Part B - A.C. circuit analysis:</u> the basic of Alternating Current AC; The Phasor equivalent circuit; series & parallel connections and equivalent impedance; Methods of Ac-circuit Analysis; superposition; Nodal & Mesh analysis; Thevenin's Theorem; Norton's Theorem; Power factor and average power in the sinusoidal Ac-circuits; Complex power; Series & parallel resonance. [35 hrs]

Learning and Teaching Strategies	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
Structured SWL (h/sem)ل	30	**Structured SWL (h/w)** ا	4
Unstructured SWL (h/sem)	30	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	**60**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	[3,6,9,12]	LO (#1- #12)
	Assignments	1	10% (10)	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		

	Report	1	10% (10)	12	LO #11
Summative assessment	**Midterm Exam**	1.5 hr	10% (10)	10	LO #(1-8)
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	The capacitor & The inductor
Week 2	Analysis of RC & RL -transient circuits
Week 3	Analysis of RLC transient circuits
Week 4	The basic of Alternating Current AC
Week 5	The Phasor equivalent circuit
Week 6	series & parallel connections and equivalent impedance
Week 7	Methods of Ac-circuit Analysis
Week 8	superposition
Week 9	Nodal & Mesh analysis

Week 10	Thevenin's Theorem
Week 11	Norton's Theorem
Week 12	Power factor and average power in the sinusoidal Ac-circuits
Week 13	Complex power
Week 14	Series & parallel resonance
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	**" Engineering Circuit Analysis"** By W. Hayt	Yes

Recommended Texts	**"Introductory Circuit Analysis"** By Boylested	Yes

Grading Scheme				
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 Information معلومات المادة الدراسية					
Module Title	**Engineering Drawing**			**Module Delivery**	
Module Type	Core			☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	NVEE201				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		1	**Semester of Delivery**		2
Administering Department			**College**		
Module Leader	Noor Yassar		**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
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	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Students will be able to: 6. Drawing engineering shapes manually and clearly, including the effective use of the computer-aided drawing program (AutoCAD). 7. Develop a solid understanding of the basic principles of engineering drawing, Included the ability to work with concepts, analytically, and visualize them and a functional understanding of how these ideas will manifest in the real world. 8. Determine the strategies to be used and the assumptions to be made. 9. Use both manual and computer approaches in drawing figures. 10. Develop the ability to use engineering tools flexibly and creatively. 11. Develop an integrated understanding of the AutoCAD module. 12. Developing their ability to communicate scientific ideas. 13. Develop expertise in experimental methodologies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	14. Understand and apply the basics of drawing types of lines. 15. Define, explain and apply engineering drawing operations. 16. Understand the basics of drawing an ogee curves 17. Understand and apply the basic idea of central projection theory. 18. Explanation of the central and parallel projection theory to understand the projection process. 19. Explain Different Views are Front View (FV), Top View (TV) and Side View (SV) FV is a view projected on VP. TV is a view projected on HP. SV is a view projected on PP. 20. Ability to draw using AutoCAD.
Indicative Contents المحتويات الإرشادية	**Introduction to engineering drawing and its tools** Introduction and introducing students to the subject of engineering drawing, which includes Identification of engineering tools and how to use them. **Engineering shapes and the arcs , lamina. , Dimensions:** - Various engineering operations: - - Drawing a straight line parallel to a known straight line - The division of the rectum into two halves - Angle division is known. - Drawing a straight line parallel to a known straight line from a point that does not belong to the known straight line. - Draw a tangent to a circle from a point that does not belong to it. - Draw a tangent to two contiguous circles from the outside. - Draw a tangent to two contiguous circles from the inside

	Multi view projection - Perpendicular Projection Theory of Objects: - Types of projections resulting from vertical projection and approved in the projection of various engineering objects - Front view - Side view. - Top view **Using AutoCAD** - Apply everything that has been explained in the manual engineering drawing on the AutoCAD program and drawing the three-dimensional models

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	6	20% (20)	5 and 10	LO #1, 2, 10 and 11
	Assignments	3	10% (10)	2 and 12	LO # 3, 4, 6 and 7
	Projects / Lab.	3	10% (10)	Continuous	All
	Report	0	0% (0)	0	
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO # 1-4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and introducing students to the subject of engineering drawing, which includes identification of engineering tools and how to use them.
Week 2	Teach students how to apply and draw the following engineering operations: Drawing a straight line parallel to a known straight line, the division of the rectum into two halves, angle division and drawing a straight line parallel to a known straight line.
Week 3	Teach students how to draw a tangent to two contiguous circles from the outside, Draw a tangent to two contiguous circles from the inside
Week 4	Draw a tangent to one circle from the inside and the other from the outside and draw a tangent to a circle passing through a straight line.
Week 5	Multi view projection Perpendicular Projection Theory of Objects:

	• Types of projection in drawing and its practical importance
Week 6	Types of projections resulting from vertical projection and approved in the projection of various engineering objects: Front view, Side view ,Top view
Week 7	Mid-term Exam + Introduction to AutoCAD
Week 8	Apply everything that has been explained in the manual engineering drawing on the AutoCAD program and drawing the three-dimensional models
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-15	The application of each part of the covered drawing subject theoretically and according to the weekly sequence of the curriculum in the AutoCAD laboratory

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**

Required Texts	EGINEERING DRAWING AND GRAPHIC TECHNOLOGY", Fourteenth Edition, By: THOMAS E.FRENCH, CHARLES .VIERCK, ROBERT J.FOSTER,McGRAW-HILL	Yes
Recommended Texts	➢ William D.CallisterJr.&David D.Rethwisch.(2010)"Material Science and Engineering An introduction", eightEdition.	No
Websites	ENGINEERING DRAWING Any edition	

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 Information معلومات المادة الدراسية					
Module Title	**MathematicsII**			**Module Delivery**	
Module Type	**Base**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NVEE 207**				
ECTS Credits	٦				
SWL (hr/sem)	١٥٠				
Module Level		1	**Semester of Delivery**		1
Administering Department		Electronic Eng. Dep.	**College**	Electronics Engineering	
Module Leader	Hani M. S. Salman		**e-mail**	hani.mohamed@uoninevah.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	**Module Leader's Qualification**		MSc
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NEEM1211	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To obtain a good knowledge of dealing with complex numbers. 2. Establish a strong foundation in matrices and their operations, determinants, and inverse matrices. This includes covering definitions, notations, properties, types, and basic operations on matrices, enabling effective application in problem-solving. 3. enhancing students' proficiency in matrix-based solutions for linear systems of equations using Cramer's rule, the inverse method, and the Gauss elimination method

	4. To provide the students with the knowledge to deal with vectors and their mathematical operations. 5. To Learn about the polar coordinates, and the graphs of polar equations. 6. Apply calculus principles to solve real-world engineering problems, developing problem-solving skills and the ability to apply calculus concepts to practical situations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	21. Comprehend and utilize complex numbers within the Argand diagram, and 22. master complex number operations (Addition, subtraction, product, quotient, power, and roots) and De Moivre's Theorem. 23. Understand the concept of linear algebra and matrices. 24. Identify the types of matrices such as square matrices, zero matrix and identity. 25. Perform the common matrix operations such as addition, subtraction, scalar multiplication, and multiplication. 26. Find the transpose of a matrix. 27. Compute the determinants. 28. Compute the inverse of the matrix. 29. Identify whether the matrix is invertible or singular. 30. Relate a matrix to a homogenous system of linear equation. 31. Solve a system of linear equations by matrices: using Cramer's rule. 32. Solve a system of linear equations by matrices: using the inverse method. 33. Solve a system of linear equations by matrices: using Gauss Elimination Method. 34. Identify the rank of the matrix and its relation to the solution of linear equations. 35. Find the eigenvalues and eigenvectors of a matrix. 36. Represent a vector in space. 37. Compute dot and cross products in vectors. 38. Understand the meaning of del operator, gradient, divergence, and curl and to compute the del operation, gradient, divergence, and curl. 39. Learn about the vector functions. 40. Convert from Cartesian to Polar coordinates and vice versa. 41. Sketch in polar system. 42. Utilize mathematical reasoning and critical thinking skills to analyze and interpret mathematical concepts and their applications in Electronics engineering. 43. Develop proficiency in mathematical problem-solving, both independently and collaboratively, and communicate solutions effectively.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Review of Complex Numbers:</u> The Argand diagram, Addition, Subtraction; Product, Quotient, power and roots, and Demoiver's Theorem. [4hrs]

	Part B – Matrices and Determinants: Matrices and Determinants: Definitions and notations, Properties, types of matrices, basic operations on matrices, computation of the determinants of matrices, properties of determinants. [8 hrs] Inverse of the Matrices. [4 hrs] Solution of the system of linear equations-solution of the system of linear equation using Cramer's rule, solution of the system of linear equation using the inverse method. [12 hrs] Revision problem classes [4 hrs] solution of the system of linear equation using Gauss Elimination Method. [4 hrs] Eigenvalues and eigenvector. [4 hrs] Part C – Review of Vectors: Representation of vectors in space (i;j;k), unit vectors, Scalar product, and Vector product. [8 hrs] Part D – Vector Calculus: Vectors – del operator, Parametric Equations of Lines in Space, the distance from a Point to a line in Space, plane equation in space, the Distance from the Point to a Plane, Angles Between Planes, vector function versus Scalar function, del operator, Gradient, Divergence and Curl. [12 hrs] Part E – Polar Coordinates: Polar coordinates – polar coordinate system, transformation between polar and Cartesian coordinates, graphs of polar equations. [4 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's major aim is to foster student engagement, improve critical thinking abilities, and promote collaborative learning. Interactive seminars, interesting tutorials, and exercises encourage active participation, allowing

	students to hone their critical thinking skills and apply engineering mathematics principles to problem solving. Furthermore, students collaborate on engineering mathematics issues, examine real-world scenarios, and explore the practical applications of the principles acquired through group activities, projects, and conversations. This method not only increases students' comprehension of engineering mathematical concepts, but it also fosters cooperation, communication, and key interpersonal skills that will be useful in their future engineering activities.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	30% (30)	6 and 14	LO #1 - #11, #16- #19
	Assignments	1	10% (10)	13	LO #12-#15
	Projects / Lab.	-	-	-	-
	Report	-	-	-	-
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #11
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The Argand diagram, Addition, Subtraction; Product, Quotient, power and roots, and Demoiver's Theorem.
Week 2	Matrices and Determinants: Definitions and notations, Properties, types of matrices, basic operations on matrices, computation of the determinants of matrices, properties of determinants.
Week 3	
Week 4	Inverse of the Matrices.
Week 5	Solution of the system of linear equations-solution of the system of linear equation using Cramer's rule.
Week 6	solution of the system of linear equation using the inverse method.
Week 7	solution of the system of linear equation using Gauss Elimination Method.
Week 8	Revision problem classes, Mid-term Exam
Week 9	Eigenvalues and eigenvector. [4 hrs]
Week 10	Representation of vectors in space (i;j;k), unit vectors, Scalar product, and Vector product.
Week 11	
Week 12	Vectors – del operator, Parametric Equations of Lines in Space, the distance from a Point to a line in Space, plane equation in space, the Distance from the Point to a Plane, Angles Between Planes, vector function versus Scalar function, del operator, Gradient, Divergence and Curl.
Week 13	
Week 14	
Week 15	Polar coordinates – polar coordinate system, transformation between polar and Cartesian coordinates, graphs of polar equations.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**"Higher Engineering Mathematics", 7th edition by John Bird**	No
	G. B. Thomas Jr., M. D. Weir, J. Hass, and F. R. Giordano, "Thomas' Calculus," 12th ed., Pearson, 2019.	Yes
Recommended Texts	**"Introduction to Linear Algebra". 4th edition by Strang, Gilbert** **"Linear Algebra for Everyone". 2020 by Strang, Gilbert** **Zill, D. G., Wright, W. S., & Cullen, M. R. (2011).** **Advanced Engineering Mathematics. Jones & Bartlett Publishers.**	No
Websites	https://ocw.mit.edu/courses/18-06-linear-algebra-spring-2010 https://www.khanacademy.org/math/linear-algebra https://www.ohio.edu/mechanical-faculty/williams/html/PDF/MatricesLinearAlgebra.pdf	

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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	**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 Information

Module Title	**Physical of semiconductors**	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	NVEE219	
ECTS Credits	6	
SWL (hr/sem)	150	

Module Level	1	**Semester of Delivery**	2
Administering Department	EI	**College**	NE
Module Leader	Hamsa Fawaz Thanoon	**e-mail**	hamsa.thanoon@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc
Module Tutor		**e-mail**	E-mail
Peer Reviewer Name		**e-mail**	E-mail
Scientific Committee Approval Date	04/07/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module		**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. To develop problem solving skills and understanding of Atomic Structure 2. To understand Energy band structure of metal, insulator, and semiconductor. 3. To understand Properties of intrinsic P and N type semiconductors.

	4. To understand Electrical conduction in intrinsic semiconductor. 5. To understand Properties of extrinsic semiconductors. 6. To understand Electrical conduction in extrinsic semiconductor
Module Learning Outcomes	1. Recognize how semiconductors works in electronics circuits. 2. List the various terms associated with electronics circuits. 3. Summarize what is meant by a basic of semiconductors. 4. Discuss the reaction and involvement of semiconductors in generate the currents. 5. Describe mobility of electrons and conductivity in metals. 6. Define Ohm's law. 7. Identify the pure semiconductors. 8. Identify the impure semiconductors 9. Discuss the impure semiconductors N and P types 10. Explain the type of electronic emission.
Indicative Contents	Indicative content includes the following. <u>Part A - Energy Bands in Solids</u> <u>Describe the structure of an atom ◆ Discuss insulators, conductors, and semiconductors and how they differ. [9 hrs]</u> <u>Revision problem classes [3 hrs]</u> <u>Part B - Transport Phenomena in Semiconductor</u> <u>Describe how current is produced in a semiconductor ◆ Describe the properties of n-type and p-type semiconductors. [30 hrs]</u>

Learning and Teaching Strategies

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL)			
Structured SWL (h/sem)	111	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	65	**Unstructured SWL (h/w)**	2
Total SWL (h/sem)	**176**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	10	[2,4,5,6]	LO (#1- #12)
	Assignments	2	10	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11
Summative assessment	**Midterm Exam**	1.5 hr	20% (20)	10	LO #(1-8)
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	PN junction in equilibrium
Week 2	Volt Ampere characteristics; Temperature dependence
Week 3	diffusion capacitance
Week 4	Non-linear properties; Ideal diode; Basic theory and analysis of simple diode circuit; DC load line; Small signal analysis and concept of dynamic resistance; AC load line
Week 5	Diode capacitance ;Temperature effects of diode
Week 6	Different types of diodes (Zener; schottckey);
Week 7	(Varactor diode; Tunnel and negative resistance diodes).
Week 8	Circuit analysis of half wave and full wave rectifiers
Week 9	Bridge rectifier; Ripple and form factor calculations
Week 10	Types of filters; C filters , L filter ,L .C. filter, PIE filter; Analysis of filter and calculation of ripple and regulation.
Week 11	Solved problems
Week 12	Clipping and Clam Ping Circuit:

Week 13	Transistors: PNP; NPN
Week 14	The BJT as an Amplifier
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	1: " SOLID STATE DIVICES" ‹PHI; 4TH EDITION ‹1995.By STREETMAN ‹	Yes

	2: “SEMICONDUCTOR DEVICES & CIRCUITS" ،JOHN WILEY & SONS ،1992.By : M.S. TYAGI 3: " ELECTRONICS DEVICES & CIRCUITS THEORY" ،HI; By BOYLSTED & NASHELSKY	
Recommended Texts	3. (Floyed) 4. ثيراجا فصل ٥١	Yes

Grading Scheme

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 Information
معلومات المادة الدراسية

Module Title	**English**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NVU11**		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		

Module Level	1	**Semester of Delivery**	2
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	
Module Aims أهداف المادة الدراسية	7. To develop skills, reading, writing and understanding of English language through the application of teaching techniques. 8. To understand scientific subjects and technical terms through reading and comprehension. 9. This course deals with the basic concepts of scientific subjects. 10. This course handles how to write simple research and how to make a successful presentation. 11. To understand the scientific language in English.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	5. Recognize parts of speech and tenses in English language. 6. List the various terms associated with scientific texts. 7. Summarize what is meant by a basic electric circuit. 8. Discuss Electric currents, series and parallel circuits. 9. Describe electrical power, charge, and current. 10. Discuss computers, communication and the future of computers.. 11. Identify the basic circuit elements and their applications. 12. Explain energy types and forms. 13. Discuss the various properties of radio waves and vacuum tubes. 14. Explain modulation. 15. Discuss Electromagnetism.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1.parts of speech _verb _ noun _ pronoun 2.Tenses _Past _Present _future 3.Electric currents and circuit _AC/DC

	_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.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	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.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	33	**Structured SWL (h/w)**	2

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	4,6	LO #1, 2, 3,4 ,5and 6
	Assignments	2	5% (5)	9, 12	LO # 7,8,9,10,and 11
	Presentation	1	10% (10)	Continuous	
	Report	1	5% (5)	13	LO # 6,10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-8
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Parts of speech
Week 2	Tenses
Week 3	Electric currents and circuit

Week 4	Radio waves and vacuum tubes
Week 5	The future of computers, communication applications.
Week 6	Induction -Electric generator -Electric transformer
Week 7	Mid-term Exam
Week 8	Induction -Self-induction -Servomechanism
Week 9	Incandescent lamp.
Week 10	Energy. -types of energy -forms of energy
Week 11	Introduction to electron and electricity.
Week 12	Electricity and electronics
Week 13	The cathode ray tube
Week 14	Propagation
Week 15	Modulation
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	English in electrical engineering and electronics.	Yes

	The language of electrical and electronic engineering in English.	
Recommended Texts	English for electrical engineering and computing.	No
Websites	https://www.askoxford.com/betterwriting/succesfulcv/application/?view=uk	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
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8. Contact

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