Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2025

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Nineveh

Faculty/Institute: College of Electronics Engineering

Scientific Department: Department of Electronics Engineering

Academic or Professional Program Name: Bachelor of Science in Electronics Engineering

Final Certificate Name: Bachelor of Science in Electronics Engineering

Academic System: Annual with the Bologna System for the first and second years

Description Preparation Date:

File Completion Date:

Signature: **Signature**:

Head of Department Name: **Scientific Associate Name**:

Assistant Professor Harith Ahmed   **Assistant Professor Bilal Alaa**

Mohammed   **El–Din Jabr**

Date: **Date**:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
Electronics Engineering should specialize in electronics engineering sciences and be distinguished by its engineering education and scientific research leading to the advancement of knowledge, the development of the profession, and serving the community through partnership with industries, engineering and service institutions, and the graduation of cadres to provide the community with highly qualified cadres.

2. **Program Mission**
1. Education : Providing specialized engineering educational programs with a precise specialization for undergraduate and graduate studies. Providing a distinguished and recognized educational environment so that its graduates have high professional experience and basic engineering education that enables them to contribute effectively to serving their community and raising the level and progress of their profession. All of this falls within the international standard specifications and is implemented by adopting the ABET quality system in the field of engineering education.   2. Research: Providing a high-level research environment so that its professors, researchers and students can conduct research in basic, applied and exploratory engineering fields and disseminate and apply available and new knowledge in a way that serves the community and the region and interacts with the world.   3. :Leadership Developing leadership capabilities for staff and students, and instilling self-learning, reflection, and deduction abilities in those who possess talent in the field of profession.   4. Community Service : Interacting with the community and engaging in the field of developing the country's industry and engineering institutions, which leads to the social and economic development of the country through consultations, continuous education, and commitment to industrial problems as research to provide solutions for them.

3. Program Objectives

A. Graduation of engineers Specialists in the field of engineering sciences Electronics and its applications with high specifications, they have the ability to work in Public and private sector.

B. Effective contribution to the renaissance and progress of society through holding seminars, conferences and continuous education.

C. Producing solid applied scientific research in the field of electronic engineering for the purpose of solving industrial and service problems in society.

D. Strengthening the leadership aspect among members and graduates and instilling a spirit of cooperation among them.

E. Granting postgraduate degrees in the department's various specializations with high specifications.

F. Adopting the approach of updating the curricula and improving performance in activities and events to ensure achieving the desired goals of the department according to (ABET) quality standards.

4. Program Accreditation

NOTHING

5. Other external influences

NOTHING

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	4	12	7.8%	Basic
College Requirements	8	36	23.4	Basic
Department Requirements	25	106	68.8	Basic

Summer Training	Third class			
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First / Semester ١	NVEE206	Mathematics I	٣	-
First / Semester ١	NVEE215	DC Circuits Analysis	٣	-
First / Semester ١	NVEE218	Physical Electronics	٣	٣
First / Semester ١	NVEEEL114	Computer science	٢	-
First / Semester ١	NVEE203	Mechanical engineering principles	2	٢
First / Semester ١	NV12	Democracy and Human Rights	٢	-
First / Semester ٢	NVEE216	AC Circuits Analysis	٢	-
First / Semester ٢	NVEE207	Mathematics II	٣	٣
First / Semester ٢	NVEE219	Physics Of Semiconductor	٣	
First / Semester ٢	NVEE217	Digital Techniques	٢	-
First / Semester ٢	NVEE201	Engineering Drawing	٢	٢
First / Semester ٢	NVU11	English	-	٣
			٢	
Second Medical Equipment Electronics				
/ Second Semester ١	NVEE208	Engineering Analysis I	٢	-
/ Second Semester ١	NVEEELM211	Signal Analysis	٢	٢
/ Second Semester ١	NVEEELM212	Electronic I	٢	٣
/ Second Semester ١	NVEE223	Digital design	٣	-
/ Second Semester ١	NVEE215	Electromagnetic fields I	٢	٢
/ Second Semester ١	NVEEELM 213	Human Physiology	٢	-
/ Second Semester ٢	NVEE210	signals and systems	٢	٢
/ Second Semester ٢	NVEE209	Engineering Analysis II	٢	-
/ Second Semester ٢	NVEEELM221	Electronic II	٢	-

Second / Semester ٢	NVEEELM222	programming	٢	٢
Second / Semester ٢	NVEE221	Electromagnetics FieldsII	٢	
Second / Semester ٢	NVU13	The Crimes of the Defunt Baath Party	٢	-
SecondIndustrial				
Second / Semester ١	NVEE208	Engineering Analysis I	٢	-
Second / Semester ١	NVEEELI212	Electronic I	٢	٣
Second / Semester ١	NVEEELI213	DC Machines	٢	٢
Second / Semester ١	NVEEELI214	Computer Programming	٢	٢
Second / Semester ١	NVU13	The crimes of the defunct Baath Party	٢	-
Second / Semester ١	NVEE221	Fundamentals of Electromagnetics	٢	-
Second / Semester ٢	NVEE209	Engineering Analysis II	٢	-
Second / Semester ٢	NVEEELI222	Electronics II	٢	٢
Second / Semester ٢	NVEEELI223	AC Machines	٢	٢
Second / Semester ٢	NVEEELI224	Computer Languages	٢	٢
Second / Semester ٢	NVEE223	Digital Design	٣	-
Second / Semester ٢	NVEE210	Signals and Systems	٢	٢
the third	EE3301	Electronic II	3	-
the third	EE3201	Digital Signal Processing	٣	-
the third	EE3302	Control Engineering	3	-
the third	EE3303	Microprocessors	٣	-
	EE3304A	Digital System Design I		
the third	EE3304B	Digital System Design II	٣	-
the third	EE3305	Communications	٣	-
the third	EE3306	ELECTRONIC INSTRUMENTATION	٣	-
the third	EE3307	Laboratory	-	٦
Fourth	E E4301	Industrial Electronic	٣	-
Fourth	EE4302	DATA TRANSMISSION& COMPUTER ETWORKS	٣	-
Fourth	EE4303	Microprocessor & Micro Controller	٣	-

Fourth	EE4304	Microelectronics	٣	-
Fourth	EE4305	Radiation	٣	-
Fourth	EE4306	Computer aided design	٣	-
Fourth	EE4307	Engineering Project	1	٣
Fourth	EE408	Laboratory	-	٦

8. **Expected learning outcomes of the program**	
Knowledge	
Learning Outcomes 1	Enabling graduate students to gain knowledge, understanding, principles and basic theories in the field of electronics engineering. Empowering students Graduates will understand and comprehend advanced modern scientific topics in the field of specialization in electronics engineering. Enabling graduate students to understand the mathematical principles and basics of representing, analyzing, and studying systems and how to design different electronic systems. Helping the student to learn about the most important computer software used in the field of solving engineering problems and to be able to understand the basics of the operation of electronic systems and how to program them to perform specific practical tasks.
Skills	
Learning Outcomes 2	Ability to design and implement the assembly components of electronic systems. Ability to design and implement various software, in addition to those related to basic operating systems and information systems, and the ability to use the advanced and various technologies. and use it in different applications.
Learning Outcomes 3	Ability to understand the basics of designing and operating electronic devices and keeping up with modern technology. The ability to set appropriate specifications for electronic devices and the basic programs required to operate them, in addition to the technical equipment required to implement automation and e-government operations.
Ethics	
Learning Outcomes 4	Developing the student's ability to perform the tasks assigned to him and complete them on time with accuracy and dedication. the development of scientific analytical thinking based on basic scientific and logical rules.

Learning Outcomes 5	Enabling the student to dialogue and discuss issues related to his specialization in a fruitful manner. Exchange views and allow others to clarify different points of view on the issues raised.

9. Teaching and Learning Strategies

Continuous follow-up of the academic program and all its activities.
Form groups of students and involve them in solving a real problem and discussing the proposed solutions.
Opening the door to dialogue on some issues and hearing different opinions aboutthe program and its continuous development.
Focus on the nature of the problems addressed by graduation projects. For the past year, andemphasize on the practical aspects of it, which give the student additional experience that will benefit him later in the field of work when employed.

10. Evaluation methods

- online.
- Submitting laboratory reports.
- Evaluation of the practical implementation of experiments.
- Providing various activities.
- Daily, quarterly, and final exams in person and online.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Mr	Physics	plasma			Staff	
assistant professor	Electrical Engineering	Microelectronics			Staff	
assistant professor	Electrical Engineering	communication			Staff	

assistant professor	Computer Engineering	communication			**Staff**	
assistant professor	Electrical Engineering	Power electronics			**Staff**	
assistant professor	Electrical Engineering	communication			**Staff**	
assistant professor	PhD	date			**Staff**	
Teacher	Electrical Engineering	Microelectronics			**Staff**	
Teacher	Computer Engineering	communication			**Staff**	
Teacher	Computer Engineering	Computer and information technology			**Staff**	
Teacher	Computer Engineering	Digital image analysis and processing			**Staff**	
Teacher	Electrical Engineering	Electronics and communications			**Staff**	
Teacher	Electrical Engineering	Electronics and communications			**Staff**	
Teacher	Electrical Engineering	Electronics and communications			**Staff**	
Teacher	Electronic engineering	Electronic			**Staff**	
Teacher	Electronic engineering	Electronic			**Staff**	
Teacher	Electrical Engineering	Solid state			**Staff**	
Teacher	Electrical Engineering	Electronics and communications			**Staff**	
Assistant Professor	Electrical Engineering	Power electronics			**Staff**	
Assistant Professor	Electrical Engineering	Electronics and communications			**Staff**	
Assistant Professor	Electrical Engineering	Electronics and communications			**Staff**	
Assistant Professor	Computer Engineering	Computer and information technology			**Staff**	
Assistant Professor	Electrical Engineering	Power electronics			**Staff**	

Assistant Professor	Electronic engineering	Electronic			**Staff**	
Assistant Professor	Computer Engineering	Calculators			**Staff**	
Assistant Professor	Electronic engineering	Electronic			**Staff**	
Assistant Professor	Electrical Engineering	Electronic			**Staff**	
Assistant Professor	Electronic engineering	Electronic			**Staff**	
Assistant Professor	Mechanical Engineering	Thermal engineering			**Staff**	
Assistant Professor	Electronic engineering	Computer and information technology			**Staff**	
Assistant Professor	Mechanical Engineering	Thermal engineering			**Staff**	
Assistant Professor	Electrical Engineering	Electronics and communications			**Staff**	
Assistant Professor	Electrical Engineering	Electronics and communications			**Staff**	
Assistant Professor	Electrical Engineering	Power and machinery			**Staff**	
Assistant Professor	Electrical Engineering	Power electronics			**Staff**	
Assistant Professor	Electronic engineering	Electronics			**Staff**	
Assistant Professor	Mechanical Engineering	Thermal engineering			**Staff**	
nothing	engineering	engineering			**Staff**	
nothing	engineering	engineering			**Staff**	
nothing	engineering	engineering			**Staff**	
nothing	engineering	engineering			**Staff**	
nothing	engineering	engineering			**Staff**	
nothing	engineering	engineering			**Staff**	
nothing	engineering	engineering			**Staff**	
nothing	engineering	engineering			**Staff**	

nothing	engineering	engineering			**Staff**	
nothing	Management and Economics	Management and Economics			**Staff**	
nothing	institute	institute			**Staff**	

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full−time, and part−time faculty at the institution and department level.
Professional development of faculty members
Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12.   **Acceptance Criterion**
The approved admission plan for new students in the department's programs naturally follows the central admission plan of the Ministry of Higher Education and Scientific Research and is implemented by the university and the college. It can be said that the students enrolled in the department's programs represent the highest levels of their grades among applicants to the College of Electronics Engineering , as the principle of comparison is based on the average of the preparatory study and the student's desire to determine the study program within the programs of the College of Electronics Engineering. Therefore, the nature of the students accepted in the department's programs are distinguished by their academic and intellectual levels and their giving throughout the program period.

13.   **The most important sources of information about the program**
Detailed information about the department's programs can be obtained By visiting the official website of the University of Nineveh and browsing the

website of the College of Electronics Engineering:
www.uoninevah.edu.iq

Self-evaluation report and annual department guide within the university
 and college guide .

14.	Program Development Plan
The curriculum is updated annually according to the latest relevant scientific books and labor market requirements, in addition to using the international information network to view the curriculum items of the subject in other leading international universities in this field.	

				Required program Learning outcomes											
				Knowledge				Skills				Ethics			
Year/Level	Course Code	Course Name	Basic or optional	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
the first	NVEE206	Mathematics I	Basic	✳	✳	✳	✳	✳		✳		✳	✳	✳	✳
	NVEE215	DC Circuits Analysis	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳		✳	✳
	NVEE218	Physical Electronics	Basic	✳	✳	✳		✳	✳	✳	✳	✳	✳	✳	✳
	NVEEELM111	Computer science	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	
	NVEE203	Mechanical engineering principles	Basic	✳		✳		✳	✳	✳	✳	✳	✳	✳	
	NVU12	Democracy and Human Rights	Basic	✳			✳					✳	✳		✳
	NVEE216	AC Circuits Analysis	Basic	✳	✳	✳	✳	✳		✳	✳	✳	✳	✳	✳
	NVEE207	Mathematics II	Basic	✳	✳		✳	✳	✳		✳	✳	✳	✳	✳
	NVEE219	Physics Of Semiconductor	Basic	✳		✳	✳	✳	✳	✳	✳			✳	✳

Program Skills Outline

			Basic												
	NVEE217	Digital Techniques	Basic	✳	✳	✳	✳	✳	✳		✳	✳	✳	✳	✳
	NVEE201	Engineering Drawing	Basic	✳	✳		✳	✳	✳	✳	✳	✳	✳	✳	✳
	NVU11	English	Basic	✳	✳		✳	✳		✳	✳	✳	✳	✳	✳
			Basic												
/the second medical	NVEE208	Engineering Analysis I	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	
	NVEEELM211	Signal Analysis	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳		✳	✳
	NVEEELM212	Electronic I	Basic	✳	✳	✳	✳	✳	✳	✳	✳		✳	✳	✳
	NVEE223	Digital design	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	
	NVEE215	Electromagnetic fields I	Basic	✳	✳		✳	✳	✳		✳	✳	✳	✳	✳
	NVEEELM 213	Human Physiology	Basic	✳	✳		✳	✳		✳		✳			✳
	NVEE210	signals and systems	Basic	✳		✳	✳	✳	✳	✳	✳	✳	✳	✳	✳
	NVEE209	Engineering Analysis II	Basic	✳	✳	✳	✳		✳	✳		✳	✳	✳	
	NVEEELM221	Electronic II	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳

	Code	Course	Type												
	NVEEELM222	programming	Basic	∗	∗	∗	∗	∗	∗	∗	∗	∗		∗	
	NVEE221	Electromagnetics FieldsII	Basic	∗	∗	∗	∗	∗	∗		∗	∗		∗	
	NVU13	The Crimes of the Defunt Baath Part	Basic		∗	∗			∗	∗		∗		∗	
Second/Indus trial	NVEE208	Engineering Analysis I	Basic	∗	∗	∗	∗	∗	∗		∗	∗		∗	
	NVEEELI212	Electronic I	Basic	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗
	NVEEELI213	DC Machines	Basic	∗	∗	∗	∗		∗	∗	∗	∗		∗	
	NVEEELI214	Computer Programming	Basic	∗	∗	∗		∗	∗	∗		∗	∗	∗	∗
	NVU13	The crimes of the defunct Baath Party	Basic		∗		∗	∗	∗	∗	∗	∗	∗	∗	*
	NVEE221	Fundamentals of Electromagnetics	Basic	∗	∗		∗	∗	∗	∗	∗	∗	∗	∗	∗
	NVEE209	Engineering Analysis II	Basic	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	
	NVEEELI222	Electronics II	Basic	∗		∗	∗	∗		∗	∗	∗	∗	∗	∗
	NVEEELI223	AC Machines	Basic	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	

	Code	Course	Type												
	NVEEELI224	Computer Languages	Basic	✳	✳	✳	✳		✳	✳	✳	✳	✳	✳	✳
	NVEE223	Digital Design	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳
	NVEE210	Signals and Systems	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳
the third	EE3301	Electronic II	Basic	✳	✳	✳	✳		✳	✳		✳	✳	✳	✳
	EE3201	Digital Signal Processing	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳
	EE3302	Control Engineering	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳
	EE3303	Microprocessors	Basic	✳	✳	✳		✳	✳	✳	✳	✳	✳	✳	✳
	EE3304	DIGITAL SYSTEM DESIGN	Basic	✳		✳	✳			✳	✳		✳	✳	✳
	EE3305	Communications	Basic	✳	✳		✳	✳		✳	✳	✳	✳	✳	✳
	EE3306	ELECTRONIC INSTRUMENTATION	Basic	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳	✳
	EE3307	Laboratory	Basic	✳	✳	✳	✳	✳	✳	✳	✳		✳	✳	✳
			Basic												

Year	Code	Course	Type	1	2	3	4	5	6	7	8	9	10	11	12
Fourth	EE4301	Industrial Electronic	Basic	✻		✻	✻	✻	✻		✻	✻	✻	✻	✻
	EE4302	DATA TRANSMISSION& COMPUTER ETWORKS	Basic	✻	✻	✻		✻	✻	✻		✻	✻	✻	*
	EE4303	Microprocessor & Micro Controller	Basic	✻		✻	✻		✻	✻	✻	✻	✻	✻	*
	EE4304	Microelectronics	Basic	✻	✻	✻	✻	✻	✻	✻	✻	✻	✻	✻	*
	EE405	Microwave Engineering	Basic	✻	✻	✻	✻	✻	✻	✻	✻	✻	✻	✻	*
	EE4306	Computer aided design	Basic	✻	✻	✻	✻		✻		✻	✻	✻	✻	✻
	EE4201	Engineering Project	Basic	✻	✻	✻	✻	✻	✻	✻	✻	✻	✻	✻	*
	EE4307	Laboratory	Basic	✻	✻	✻	✻		✻	✻	✻	✻	✻	✻	*

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation**

• Course Description Form

1.	Course Name:
DC Circuits Analysis	

2.	Course Code:
NVEE215	

3.	Semester / Year:
First / 2024−2025	

4.	Description Preparation Date:
10−12−2024	

5.	Available Attendance Forms:
In-person attendance	

6.	Number of Credit Hours (Total) / Number of Units (Total)
125 / 5	

7.	Course administrator's name (mention all, if more than one name)
Name: Zahraa Siddiq Yahya Email:	

8. Course Objectives

Course Objectives	• To identify the basic concepts of DC Electrical Eng. circuits. • To understand how is the calculation of current, voltage, and power . • To understand and cover the basic DC circuit analysis methods and theorems

9. Teaching and Learning Strategies

Strategy	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.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	6	Explain the function of each element in DC Electrical circuits	Voltage & current+ Lab (basic informatio	In person lectures	Discussions and quizzes

		Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.			
2	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Power & Energy + Lab (basic informatio	In person lectures	Discussions and quizzes
3	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Dependent and independent sources	In person lectures	Discussions and quizzes
4	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate	Ohm's laws	In person lectures	Discussions and quizzes

		analysis method to reach the aim in its simplest form.			
5	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	series & parallel connections	In person lectures	Discussions and quizzes
6	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Delta-star connection and transformations	In person lectures	Discussions and quizzes
7	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Kirchhoff's Current & Voltage Laws (KCL), (KVL)	In person lectures	Discussions and quizzes
8	6	Explain the function of each element in DC Electrical circuits	Source transformation	In person lectures	Discussions and quizzes

		Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.			
9	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Linearity & superposition	In person lectures	Discussions and quizzes
10	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Nodal analysis	In person lectures	Discussions and quizzes
11	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation	Mesh analysis	In person lectures	Discussions and quizzes

		methods. Applying the appropriate analysis method to reach the aim in its simplest form.			
12	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Thevenin's Theorem	In person lectures	Discussions and quizzes
13	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Norton's Theorem	In person lectures	Discussions and quizzes
14	6	Explain the function of each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.	Max. power transfer	In person lectures	Discussions and quizzes
15	6	Explain the function of	Preparatory week before the final exam	In person lectures	Discussions and quizzes

each element in DC Electrical circuits Use the basic circuit analysis methods and theorems to simplify the DC Electrical circuits. Explain the difference between transformation methods. Applying the appropriate analysis method to reach the aim in its simplest form.				

11. Course Evaluation

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 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**"Engineering Circuit Analysis"** By W. Hayt
Recommended books and references (scientific journals, reports…)	**"Introductory Circuit Analysis"** By Boylested

Course Description Form

1. Course Name:	
Computer science	
2. Course Code:	
NVEEELM114	
3. Semester / Year:	
First	
4. Description Preparation Date:	
12/2024	
5. Available Attendance Forms:	
In person attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
100H / 4 ECTS	
7. Course administrator's name (mention all, if more than one name)	
Name: Asmaa Nabeel Email: **asmaa.khaleel@uoninevah.edu.iq**	

8. Course Objectives

Course Objectives	General overview of personal computer architecture Computer peripherals, keyboard, screen, mouse, and storage media Computer buses, 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

9. Teaching and Learning Strategies

Strategy	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.			

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	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	Introduction to the part of computers in hardware and software, computer types, storage media	In person lectures	Discussion and Quizzes
2	4	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	Explain the computer ports, computer networks	In person lectures	Discussion and Quizzes
3	4	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	Introduction to MSDOS operating system and the internal commands of it	In person lectures	Discussion and Quizzes

		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			
4	4	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	External Ms DOS command, file and folder related commands and the editor	In person lectures	Discussion and Quizzes
5	4	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	Windows operating system	In person lectures	Discussion and Quizzes
6	4	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	Windows commands)change the background, screen saver, resolution), change the status of files, printing files, copy and save files, backups, Recycle	In person lectures	Discussion and Quizzes

		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	bin, compressing files, viruses Microsoft office word (creating new word file, bars, types and styles of fonts, copy and select of texts, saving of word file)		
7	4	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	Windows commands)change the background, screen saver, resolution), change the status of files, printing files, copy and save files, backups, Recycle bin, compressing files, viruses Microsoft office word (creating new word file, bars, types and styles of fonts, copy and select of texts, saving of word file)	In person lectures	Discussion and Quizzes
8	4	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	MS WORD: spell checking, inserting symbols, add borders, change the document setup, insert table, page numbering, insert equations and effects)	In person lectures	Discussion and Quizzes
9	4	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	MS Power point:(how to design professional presentation, change the layout of presentation and background of it, numbering slides,	In person lectures	Discussion and Quizzes

		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	insert charts, insert table and audio)		
10	4	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	MS Power point(insert an effect to the object in slide, transition between slides, grouping of objects, insert equation, copy, save and print the slides then how to start the presentation)	In person lectures	Discussion and Quizzes
11	4	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	MS EXCEL (getting started with excel, how to create a spreadsheet, copy and rename the work book, entering and deleting of data in sheet, inserting and deleting rows& columns, selecting cells, adding border to sheet)	In person lectures	Discussion and Quizzes
12	4	1.Understanding the important components of the computer and its operating system. 2. Understanding the meaning of MSDOS operating system and its commands.	MS EXCEL:how to write a formula in sheet, functions, summation of data in row or column, average function, max& min functions, count& counta,		Discussion and Quizzes

		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	round function, save and print the spread sheet		
13	4	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	Overview of High & Low level languages	In person lectures	Discussion and Quizzes
14	4	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	Matlab	In person lectures	Discussion and Quizzes
15	4	1.Understanding the important components of the computer and its operating system. 2. Understanding the meaning of MSDOS operating system and its	Matlab	In person lectures	Discussion and Quizzes

		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			
16	4		Preparatory week before the week final exam	In person lectures	Discussion and Quizzes

11. Course 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**	١,٥hours	30 % (20)	10	LO #1-4
	Final Exam	3 hours	5 0% (4 0)	16	All
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Computer Science"**
Recommended books and references (scientific journals, reports…)	**MATLAB Handbook"**
Electronic References, Websites	https://www.tutorialsmate.com/2021/12/parts-of-computer https://www.koenig-solutions.com/matlab-programming

Course Description Form

1.Course Name:
Mathmatics1
2. Course Code:
NVEE206
Semester / Year:
First
Description Preparation Date:
12/2024
Available Attendance Forms:
In person addendance
Number of Credit Hours (Total) / Number of Units (Total)
150 H / 6 ECTS
Course administrator's name (mention all, if more than one name)
hani.mohamed@uoninevah.edu.iq
Course Objectives

Course Objectives	. Gain proficiency in differentiating trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.
	. Master differentiation techniques for various types of jobs.
	. To learn how to sketch curves and deal with the transcendental functions.
	. To increase the skills related to differentiation applications.
	. Develop a strong foundation in Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.
	. Understand the concept of Application of the definite integral, including finding volumes of revolution, lengths of curves, and surface areas of revolution.
	. To learn the methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.
	. Apply calculus principles to solve real-world engineering problem developing problem-solving skills and the ability to apply calculus conce to practical situations.

Teaching and Learning Strategies

Strategy	This module's major aim is to foster student engagement, improve critical thinking abilities, and promote collaborative learning. Interactive seminars, interesting tutorials, and exercises active participation,

allowing students to hone their critical thinking skills and encourage engineering mathematics principles to problem solving. Moreover, 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.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas	Introduction – Differentiation definitions and notations, review of basic differentiation rules , chain rule, and Implicit differentiation.	In person lectures	Discussion and quizzes

		between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
2	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept of integration: types of integrals. definite integrals, infinite integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural	Partial differentiation and higher order differentiation.	In person lectures	Discussion and quizzes

				In person lectures	Discussion and quizzes
		logarithm, exponential function, and general exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
3	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept of integration: types of integrals. definite integrals, infinite	Differentiation of trigonometric functions and hyperbolic functions. Applications of differentiation; slope, tangents and normal.	In person lectures	Discussion and quizzes

		integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
4	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and	Rate of change, velocity and acceleration, maximum and minima, inflexion points and Curve plotting	In person lectures	Discussion and quizzes

		derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
5	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and	Transcendental Functions – definitions, properties, and graphs, derivative.	In person lectures	Discussion and quizzes

		Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
6	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions	Definitions and notations of integration, Types of integrals: definite integrals and infinite integrals. Integration of trigonometric function.	In person lectures	Discussion and quizzes

		and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
7	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit	Integration of inverse trigonometric function, hyperbolic function. Mid-term Exam	In person lectures	Discussion and quizzes

		differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
8	4	Understand the concept of differentiation as a	Integration of inverse	In person lectures	Discussion and quizzes

		rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.		

		Develop critical thinking and problem-solving skills by applying calculus.			
9	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution.	In person lectures	Discussion and quizzes

		Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
10	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution.	In person lectures	Discussion and quizzes

		surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
11	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 .	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution.	In person lectures	Discussion and quizzes

		Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
12	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept of integration: types of integrals. definite integrals, infinite integrals. Integration of trigonometric function, inverse trigonometric	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	In person lectures	Discussion and quizzes

		function, hyperbolic function, natural logarithm, exponential function, and general exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
13	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept of integration: types of	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	In person lectures	Discussion and quizzes

		integrals. definite integrals, infinite integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
14	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve.	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	In person lectures	Discussion and quizzes

		Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
15	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	In person lectures	Discussion and quizzes

| | | differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus. | | | | |

Course Evaluation

		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)		

Learning and Teaching Resources

Required textbooks (curricular books, if any)	G. B. Thomas Jr., M. D. Weir, J. Hass, and F. Giordano, "Thomas' Calculus," 12th ed., Pears 2019.
Electronic References, Websites	https://www.coursera.org/learn/introduction-to-calculus#syllabus https://www.edx.org/learn/calculus https://www.khanacademy.org/math/calculus-1

Course Description Form

Course Name:
Mathmatics1
Course Code:
NVEE206
Semester / Year:
First
Description Preparation Date:
12/2024
Available Attendance Forms:
In person attendance
Number of Credit Hours (Total) / Number of Units (Total)
150 H / 6 ECTS
Course administrator's name (mention all, if more than one name)
hani.mohamed@uoninevah.edu.iq

Course Objectives

Course Objectives	
	. Gain proficiency in differentiating trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.
	. Master differentiation techniques for various types of jobs.
	0. To learn how to sketch curves and deal with the transcendental functions.
	1. To increase the skills related to differentiation applications.
	2. Develop a strong foundation in Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.
	3. Understand the concept of Application of the definite integral, including finding volumes of revolution, lengths of curves, and surface areas of revolution.
	4. To learn the methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.
	Apply calculus principles to solve real-world engineering problem developing problem-solving skills and the ability to apply calcu concepts to practical situations.

Teaching and Learning Strategies

Strategy	This module's major aim is to foster student engagement, improve critical thinking abilities, and promote collaborative learning. Interactive seminars, interesting tutorials, and exercises active participation, allowing students to hone

their critical thinking skills and encourage engineering mathematics principles to problem solving. Moreover, 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.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of	Introduction – Differentiation definitions and notations, review of basic differentiation rules , chain rule, and Implicit differentiation.	In person lectures	Discussion and quizzes

		revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
2	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration	Partial differentiation and higher order differentiation.	In person lectures	Discussion and quizzes

				In person lectures	Discussion and quizzes
		to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
3	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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	Differentiation of trigonometric functions and hyperbolic functions. Applications of differentiation; slope, tangents and normal.	In person lectures	Discussion and quizzes

		exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
4	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept of integration: types of integrals. definite integrals, infinite integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural	Rate of change, velocity and acceleration, maximum and minima, inflexion points and Curve plotting	In person lectures	Discussion and quizzes

		logarithm, exponential function, and general exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
5	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept of integration: types of integrals. definite integrals, infinite integrals. Integration of trigonometric function, inverse trigonometric	Transcendental Functions – definitions, properties, and graphs, derivative.	In person lectures	Discussion and quizzes

		function, hyperbolic function, natural logarithm, exponential function, and general exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
6	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept of integration: types of integrals. definite integrals, infinite integrals. Integration of	Definitions and notations of integration, Types of integrals: definite integrals and infinite integrals. Integration of trigonometric function.	In person lectures	Discussion and quizzes

		trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
7	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept of integration: types of integrals. definite	Integration of inverse trigonometric function, hyperbolic function. Mid-term Exam	In person lectures	Discussion and quizzes

		integrals, infinite integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
8	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. Understand the concept	Integration of inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.	In person lectures	Discussion and quizzes

		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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
9	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution.	In person lectures	Discussion and quizzes

		derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
10	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve.	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution.	In person lectures	Discussion and quizzes

		Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
11	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems.	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution.	In person lectures	Discussion and quizzes

		Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
12	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation.	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	In person lectures	Discussion and quizzes

		Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
13	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions.	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	In person lectures	Discussion and quizzes

		Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
14	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	In person lectures	Discussion and quizzes

		and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus.			
15	4	Understand the concept of differentiation as a rate of change and slope of the curve. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation,	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.	In person lectures	Discussion and quizzes

| | | Differentiation of trigonometric functions and Hyperbolic Functions. Learn the applications of differentiation. Solve Maximum and Minimum problems. Learn how to Plot the Curve. Learn Transcendental functions: graphs, and derivative. 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 . Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. Develop critical thinking and problem-solving skills by applying calculus. | | | | |

Course Evaluation

		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)		

Learning and Teaching Resources

Required textbooks (curricular books, if any)	G. B. Thomas Jr., M. D. Weir, J. Hass, and F. Giordano, "Thomas' Calculus," 12th ed., Pears 2019.
Electronic References, Websites	https://www.coursera.org/learn/introduction-to-calculus#syllabus https://www.edx.org/learn/calculus https://www.khanacademy.org/math/calculus-1