

**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

2024

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.

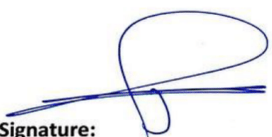
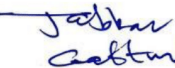
Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

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: Diyala
Faculty/Institute: College of Engineering
Scientific Department: Department of Electrical Power and Machines Engineering
Academic or Professional Program Name: Bachelor
Final Certificate Name: Bachelor of science in Electrical Power and Machines Engineering
Academic System: Course
Description Preparation Date: 13/8/2024
Completion Date: 13/8/2024

Signature: 
Head of Department Name:
Assit. prof. Dr. Balasim M. Hussein
Date: 13/8/2024

Signature: 
Scientific Associate Name:
Ass. prof. Dr. 
Date: 13/8/2024



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

Prof. Dr. Anees A. Khaden

Course description form

1. Course Name	
Applied Mathematics II	
2. Course Code	
(E202)	
3. Semester/Year	
2n'd Semester/Second Year	
4. The date this description was prepared	
2023 / 9 / 25	
5. Available forms of attendance	
Face-to-Face theoretical lectures	
6. Number of study hours (total) / number of units (total)	
60/4	
7. Name of the course administrator	
Name: Assist. Lect. Mounir Thamer Ismaiel Email: moneerthameer_enge@uodiyala.edu.iq	
8. Course objectives	
Objectives of the study subject	To study sequence, series and infinity series. Application of power series. Matrices, Eigen values and Eigen vectors. Vectors Fourier Series. A1- acquiring the essential knowledge in calculus and ability to use this knowledge in other engineering courses in electrical engineering. A2- The ability to solve different mathematical problems and gain the ability to analyze them.

				B1 - Teaching students the skills, to elaborate their mathematical tools to solve different engineering problems.	
9. Solution of non-linear equations and root findings.					
The Strategy				solve different mathematical problems and gain the ability to analyze them	
10. Numerical integration and differentiation.					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Interpolation and solving differential equations.
1	4	Sequence and Series: Convergence and Divergence Test, Geometric Series and Partial Sum	Understand the basic concepts of different tests such as simple sequence test, ratio test, and root test. The ability to determine when a sequence converges and when it diverges.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
2	4	Integral, Comparison, Ratio and Root Tests, Alternating series	Determine the convergence of a given series using function integration. If the function is positive, decreasing, volatile (decreasing variable), and convergent, then the sequence is convergent.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
3	4	Power Series, Taylor and Maclaurin Series	Understand the concept of strong series and its mathematical representation.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports

			Ability to analyze robust series properties such as convergence point and convergence range.		
4	4	Applications of Power Series	The ability to understand how functions are represented using power series. Identify the famous functions that can be represented using power series, such as algebraic,	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
5	4	Vectors: Dot and Cross Product, Equations of Lines and Planes	Understand the concept of cross-section between two triangular spaces. Ability to calculate the cross-section between two triangular spaces and interpret its meaning	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
6	4	Vector Function, Velocity and Acceleration	Understand the concept of speed and acceleration as physical quantities. The ability to calculate speed and acceleration using vector functions and interpret their meaning.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
7	4	Curvature and the Unit Normal Vectors	Understand the concept of curvature as a	Whiteboard and Data show	Daily, oral, monthly, written

			measure of the change in direction of a curve at a specific point on the curve. Ability to calculate curvature using the first and second derivatives of the representative function of the curve.		examinations and reports
8	4	Matrices: Eigen Values and Eigen Vectors	Understand the concept of eigenvalues and eigenvectors of a matrix. Learn about the importance of eigenvalues and eigenvectors in linear algebra and their applications..	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
9	4	Gauss Elimination	The ability to calculate the eigenvalues and eigenvectors of a given matrix. Using different methods, such as solving the linear equation for eigenvalues and eigenvectors.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
10	4	Rank of Matrix	Understand the concept of the method and its importance in solving systems of linear	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports

			equations. The ability to implement an algorithm to solve a system of linear equations.		
11	4	Applications of Matrices in Electric Circuits	Find the rank of the matrix	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
12	4	Multiple Integral: Double and Triple Integral, Area and Volume	Understand the concept of multiple integration and its importance in calculating area and volume in space.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
13	4	Double Integral in Polar Form	Understanding double integration in polar form: Understanding the concept of double integration and how to apply it in polar form.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
14	4	Triple Integrals in Rectangular Coordinates	Understand the concept of triple integration and its importance in mathematics and physics.	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports
15	4	Surface Integrals	Understand the concept of integrals and their role in mathematics and physics. And	Whiteboard and Data show	Daily, oral, monthly, written examinations and reports

			learn about the types of integrals, such as surface integrals on defined surfaces and general surfaces.		
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11. Course Evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

12. Learning and teaching resources

Required textbooks (methodology, if any)	Calculus and Analytic Geometry by Thomas.
Main references (sources)	Advanced Engineering Mathematics, Erwin Kryszig.
Recommended supporting books and references (scientific journals, reports....)	Calculus, Early Transcendentals by Stewart
Electronic references, Internet sites	