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: ....

Faculty/Institute: ....

Scientific Department: ....

Academic or Professional Program Name: ....

Final Certificate Name: ....

Academic System: ....

Description Preparation Date:

File Completion Date:

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

Program vision is written here as stated in the university's catalogue and website.

2. Program Mission

Program mission is written here as stated in the university's catalogue and website.

3. Program Objectives

General statements describing what the program or institution intends to achieve.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

5. Other external influences

Is there a sponsor for the program?

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
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

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

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

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline																
				Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

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

Course Description Form

1. Course Name:
Engineering and Numerical Analysis

2. Course Code:

3. Semester / Year:
Second semester / Second Year

4. Description Preparation Date:
3/4/2024

5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
Weekly 4 hours (Total 60 hours)/ 3 units

7. Course administrator's name (mention all, if more than one name)
Lecturer Intisar Swedain Ali (Intisar @kecbu.uobaghdad.edu.iq)

8. Course Objectives

Course Objectives	1.Find the solution of the first order and second order equation with constant coefficient 2. Find the summation of series finite difference techniques 3. Find the solution of ordinary differential equation of first order by Euler, Taylor and Runge-Kutta methods 4. Derive Least – Squares curve fitting procedures, fitting a straight line, nonlinear curve fitting, Curve fitting by a sum of exponentials. 5 .Find the derivatives using Newton's forward difference formula, Newton's backward difference formula, Derivatives using central difference formulae, Stirling's interpolation formula, Newton's divided difference formula, Maximum and minimum values of a tabulated function. 6. Derive Trapezoidal rule, Simpson's 1/3 – rule, Simpson's 3/8 – rule, and Weddle's rules from General Quadrature formula and find the Euler – Maclaurin Formula of summation and The Euler transformation. 7. Find the solution of linear systems by using Direct methods, Matrix inversion method, Gaussian elimination methods, Gauss-Jordan Method, Method of factorization, Solution of Tridiagonal Systems.

9. Teaching and Learning Strategies

Strategy	The learning and teaching strategies in the Engineering and Numerical Analysis module involve lectures to present theoretical concepts, tutorial for hands-on experience, problem-solving exercises to enhance critical thinking, case studies to understand real-world applications, and assessments to evaluate knowledge. These

strategies foster active learning, enabling students to understand and apply Engineering and Numerical Analysis principles effectively. By combining theory, practice, problem-solving, and collaboration, students develop a well-rounded understanding of Engineering and Numerical Analysis and gain the skills necessary to tackle real-world challenges in the field.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Introduction to Engineering and Numerical Analysis			
2	4	Laplace transform			
3	4	Laplace transform			
4	4	Curve fitting :Least – Squares curve fitting procedures, fitting a straight line			
5	4				
6	4	Curve fitting: nonlinear curve fitting, Curve fitting by a sum of exponentials.			
7	4	Numerical differentiation: Derivatives using Newton's forward difference formula, Newton's backward difference formula, Derivatives using central difference formula.			
8	4				
9	4	Numerical differentiation: Stirling's interpolation formula, Newton's divided difference formula, Maximum and minimum values of a tabulated function.			
10	4				
11	4	Numerical integrations: General Quadrature formula on errors, Trapezoidal rule, Simpson's 1/3 – rule, Simpson's 3/8 – rule, and Weddle's rules, Euler			
12	4				
13	4				
14	4	Solution of simultaneous Linear Systems of Equations: Solution of linear systems – Direct methods, Matrix inversion method, Gaussian elimination methods Solution simultaneous Linear Systems of Equations: Gauss-Jordan Method, Method of factorization, Solution of Tridiagonal Systems. Solution simultaneous Linear Systems of Equations: Iterative methods. Jacobi's method, Gauss-siedal method. Numerical solution of ordinary differential equations: Introduction, Solution by Taylor's Series, Picard's method of successive			
15	4				

		approximations Numerical solution of ordinary differential equations : Euler's method, Modified Euler's method, Runge – Kutta methods. Numerical solution of partial differential equations Numerical solution of partial differential equations		

11. Course Evaluation

Quizes, mid-term exam, assignments, labs, and seminar

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Calculus of Finite Differences And Numerical Analysis by Prof. P.P.Gupta and G.S. Malik – Krishna Prakashan Media (P) Ltd. Meerut (U.P) (2006)
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	