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 staP 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, quaJerly), 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:
Optimization
2. Course Code:
Elective
3. Semester / Year:
Third stage, First semester
4. Description Preparation Date:
2/9/2024
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Nazar K. Hussein Email: nazar.dikhil@tu.edu.iq
8. Course Objectives
1- This course deals with the basic concepts of unrestricted one-variable optimization problems. 2- Providing the student with skills in solving unrestricted optimization problems with one variable using different methods and finding the optimal solution to the problem. 3- Finding convexity, concavity, and maximum and minimum points for unrestricted problems with one variable. 4- Understanding and solving Taylor series with one variable
9. Teaching and Learning Strategies

Strategy	Stimulating and encouraging students to understand the role of the game theory in the developed knowledge society and to become aware of the scientific applications of the competitive game theory using the computer through 1- Determine the scientific concepts and principles that will be learned and put forward in the form of a question or problem. 2- Preparing the educational materials needed to implement the lesson. 3- Formulating the problem in the form of sub-questions so as to develop the skill of imposing assumptions among the learners 4- Determine the discovery activities or experiments that the learners will carry out. 5- Evaluate learners and help them apply what they have learned in situations

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4	Basic concepts: Optimization, Optimization Problem Statement, Single Variable Unrestricted Optimization Problem, Definition: Domestic Minimum Value, Local Maximum Value, Global Minimum Value, Global Maximum Value	General introduction	Lectures	Discussion and tests
2	4	concave and convex functions of one variable, necessary and sufficient conditions for one variable functions,	General introduction	Lectures	Discussion and tests
3	4	Unrestricted optimization problem methods for a single variable Dichotomy method, introduction, algorithm, examples	Basic definitions	Lectures	Discussion and tests
4	4	Newton's method, introduction, flowchart, advandge and examples	Optimization methods for a single variable	Lectures	Discussion and tests
5	4	Half-interval method, introduction, algorithm, examples.	Optimization methods for a single variable	Lectures	Discussion and tests
6	4	Fibonacci method, introduction, algorithm, examples.	Optimization methods for a single variable	Lectures	Discussion and tests
7	4	Midterm Exam	Midterm Exam	Lectures	Discussion and tests
8	4	Golden section method, introduction, algorithm, examples.	Optimization methods for a single variable	Lectures	Discussion and tests
9	4	Taylor series expansions with examples.	Optimization for more than one variable	Lectures	Discussion and tests
10	4	Definition of the Hessian matrix and matrix test (positive, negative or undefined)	Optimization for more than one variable	Lectures	Discussion and tests
11	4	Define the function for many examples as convex, concave, convex, or concave straight.	Optimization for more than one variable	Lectures	Discussion and tests

12	4	Limiting optimization with some therom and lagrange method with minimal function examples.	Optimization for more than one variable	Lectures	Discussion and tests
13	4	Lagrange method with maxmine function examples .	Optimization for more than one variable	Lectures	Discussion and tests
14	4	Cohn-Tucker condition with examples of a minimum function.	Optimization for more than one variable	Lectures	Discussion and tests
15	4	Tucker constituency condition with examples to maximize the function .	Optimization for more than one variable	Lectures	Discussion and tests

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports …etc

12. Learning and Teaching Resouces

Required textbooks (curricular books, if any)	1- Rao, S. S. (2019). *Engineering optimization: theory and practice*. John Wiley & Sons. 2- Chong, E. K., & Żak, S. H. (2013). *An introduction to optimization* (Vol. 75). John Wiley & Sons.

Main references(sources)	
Reconnended books and references (scientific journals, reports,…)	1- Sivanandam, S., Sumathi, S., Deepa, S., 2007. Introduction to fuzzy logic using MATLAB. Springer.
Electronic references, websites	3- Chen, G., Pham, T.T., 2000. Introduction to fuzzy sets, fuzzy logic, and fuzzy control systems. CRC press. Ross, T.J., 2005. Fuzzy logic with engineering applications. John Wiley & Sons.