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: **University of Baghdad**
Faculty/Institute: **AL–Khwarizmi College of Engineering**
Scientific Department: **Mechatronics Engineering**
Academic or Professional Program Name: **B.Sc.**
Final Certificate Name: ……
Academic System: **Quarterly**
Description Preparation Date: **1/4/2024**
File Completion Date: **1/4/2024**

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

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

The scientific department seeks to present academically, scientifically, and even practically in the local and international arena. The reliability of scientific laboratories is within national standards first and international standards second. Apply advanced studying and teaching systems and keeping updated with the latest developments in this field, especially e-learning. Furthermore, studying recent experiences in education and working on apply them in line with the changing standards of scientific and practical requirements. Planning to build postgraduate studies with high standard quality by preparing material requirements from laboratories and others and the scientific needs of researchers, in addition to researchers and supervisors who own a distinguished research line and global scientific publication.

2. Program Mission

The primary goal of the Mechatronics Engineering Department is to train and develop the most highly skilled engineers and leaders in the engineering field of that field. It also aims to balance knowledge in scientific research to benefit the local, regional, and global community. Additionally, the department trains and sharpens students' scientific and cognitive skills while highlighting social and cultural values and meeting local market demands. This objective necessitates adapting and developing the curricula to the various factors, ranging from the shifting demands to the various technological advancements in the scientific domains. A department's desire to realize its vision is what drives it to communicate with the outside world about the most recent advancements in science by attending international conferences and seminars, in addition to hosting many workshops and student events.

3. Program Objectives

Providing graduate engineers with the information and abilities needed for mechatronics system development and design, including applications of mechanical, electrical, electronic, control, and computer engineering. Furthermore, he will possess unique expertise that enables him to create, build, maintain, and use contemporary systems and equipment in a way that advances science. He will also be able to research issues of mechatronics. Graduate an engineer skilled in the application of sophisticated ideas linked to contemporary engineering methods in the field of mechatronics. preparing engineering personnel with a solid background so they can interact with all community members and improve and enrich the needs in Iraq. supplying information and skills that industries and businesses in the domains of robotics, industrial automation, smart systems, medical devices, and other technical and industrial applications require to prepare engineers for the labor market. Developing a scientific engineering personality that can interact with the demands of the government or the private sector of the job market.

4. Program Accreditation

N/A

5. Other external influences

N/A

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	
2023-2024/ Second	**MTE228**	**Electronics II**	**Theoretical 30**	**Practical 30**

8. Expected learning outcomes of the program

Knowledge	
Understand Fundamental Op-Amp Concepts:	Grasp the basic principles, characteristics, and operational modes of operational amplifiers (Op-Amps).
Analyze Op-Amp Circuits:	Apply circuit analysis techniques to analyze and solve problems involving Op-Amp circuits, including inverting and non-inverting configurations.
Design Op-Amp Circuits:	Design and simulate various Op-Amp circuits to meet specific requirements, considering factors like gain, bandwidth, and stability.
Implement Op-Amp Applications:	Implement and test different Op-Amp applications such as amplifiers, filters, comparators, ADC and DAC.
Integrate Op-Amps in System Design:	Integrate Op-Amps into broader electronic systems, understanding their role and impact on overall system performance.
Skills	
Circuit Analysis Skills:	Ability to analyze and evaluate Op-Amp circuits using various circuit analysis techniques, including nodal and mesh analysis.

Design Skills:	Proficiency in designing Op-Amp circuits tailored to specific requirements, considering parameters like gain, bandwidth, and component tolerances.
Measurement and Testing Skills:	Skills in using electronic test equipment like oscilloscopes, multimeters, and function generators to measure and verify Op-Amp circuit performance.
Documentation Skills:	Proficiency in documenting design processes, circuit schematics, and test results effectively.
Teamwork and Collaboration Skills:	Capacity to work effectively in teams on projects involving Op-Amp circuit design and implementation, demonstrating collaborative problem-solving abilities.
Ethics	
Professional Integrity:	Uphold professional standards and integrity in all aspects of Op-Amp circuit design, implementation, and testing, ensuring accuracy, honesty, and transparency.
Responsible Design:	Recognize the potential impact of Op-Amp circuits on society and the environment, and design circuits that prioritize safety, reliability, and sustainability.
Confidentiality:	Maintain confidentiality and protect sensitive information related to Op-Amp circuit designs, especially in collaborative or industrial settings.

9. Teaching and Learning Strategies

Lecture-Based Learning: Traditional classroom lectures will be used to introduce fundamental concepts, theories, and principles related to Op-Amp circuits. This will provide students with a solid theoretical foundation.

Interactive Discussions: Encourage interactive discussions and Q&A sessions during lectures to clarify doubts, promote critical thinking, and engage students actively in the learning process.

Hands-On Laboratory Sessions: Conduct hands-on laboratory sessions where students can design, build, and test Op-Amp circuits using breadboards,

oscilloscopes, and other electronic test equipment. This practical experience will reinforce theoretical concepts and enhance problem-solving skills.

Group Projects and Assignments: Assign group projects and individual assignments that require students to apply their knowledge of Op-Amp circuits to solve practical problems or design specific applications. This will foster teamwork, creativity, and hands-on learning.

10. Evaluation methods

Quizzes and Examinations:

Quizzes: Frequent quizzes can help reinforce key concepts and ensure students keep up with the material. Quizzes can be both announced and unannounced to encourage regular study habits.

Midterm and Final Examinations: These can include a mix of multiple-choice questions, short answers, and computational problems that require students to apply theoretical knowledge to solve practical problems.

Laboratory Assignments and Reports: Hands-on laboratory experiments where students apply digital control theories and use simulation tools. Assessment is based on the execution of experiments, the accuracy of results, and the quality of lab reports discussing the outcomes and learnings.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assist. Prog.	Electrical Engineering	Control			Yes	

Professional Development
Mentoring new faculty members
Professional development of faculty members

12. **Acceptance Criterion**

13. **The most important sources of information about the program**
1. "Microelectronics" by Jacob Millman and Arvin Grabel 2. "Electronic Devices and Circuit Theory" by Robert L. Boylestad and Louis Nashelsky.

14. Program Development Plan
Regular reviews and feedback strategy should be followed to continuously improve the course content and teaching method.

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
Fourth	MTE446	Digital Control	Basic	*				*				*			

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

Course Description Form

1. Course Name:	
Electronics II	
2. Course Code:	
MTE228	
3. Semester / Year:	
Second Semester/2024	
4. Description Preparation Date:	
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)	
Name: Assist Prof Dr Ahmed Mahrous Email: ahmed78@kecbu.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	• **Understand the Basic Principles of Operational Amplifiers (Op-Amps)** • **Analyze Op-Amp Circuits.** • **Design and Implement Op-Amp Circuits.** • **Explore Op-Amp Applications.**
9. Teaching and Learning Strategies	
Strategy	1. **Lecture-Based Learning: Traditional classroom lectures will be used to introduce fundamental concepts, theories, and principles related to Op-Amp circuits. This will provide students with a solid theoretical foundation.** 2. **Interactive Discussions: Encourage interactive discussions and Q&A sessions during lectures to clarify doubts, promote critical thinking, and engage students actively in the learning process.**

	3. **Hands-On Laboratory Sessions: Conduct hands-on laboratory sessions where students can design, build, and test Op-Amp circuits using breadboards, oscilloscopes, and other electronic test equipment. This practical experience will reinforce theoretical concepts and enhance problem-solving skills.** 4. **Group Projects and Assignments: Assign group projects and individual assignments that require students to apply their knowledge of Op-Amp circuits to solve practical problems or design specific applications. This will foster teamwork, creativity, and hands-on learning.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Operational Amplifier concept			
2,3,4	12	Op-Amp circuits			
5,6,7,8	16	Operational Amplifier application			
9	4	Sample and Hold circuits			
10,11	8	Analog to Digital Conversion circuits			
12,13	8	Digital to Analog Conversion circuits			
14	4	Active filters			

11. Course Evaluation

Midterm Examination: Testing theoretical understanding and problem-solving skills.
Lab Reports: Assessment of practical skills and application of learned concepts.
Quizzes:
Group Projects: Evaluation of collaborative work, design creativity, and implementation skills.
Final Examination: Comprehensive assessment covering all course topics.
Participation and Attendance

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	N/A
Main references (sources)	1. "Microelectronics" by Jacob Millman and Arvin Grabel 2. "Electronic Devices and Circuit Theory" by Robert L. Boylestad and Louis Nashelsky.

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	