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 Technology–Iraq

Faculty/Institute: Control and Systems Engineering Department

Scientific Department: Mechatronics and Robotics Engineering Brunch

Academic or Professional Program Name: Bachelor of Mechatronics and Robotics Engineering

Final Certificate Name: Bachelor of Science of Mechatronics and Robotics Engineering

Academic System: Semesters

Description Preparation Date: 7/4/2024

File Completion Date: 7/4/2024

Signature:

Head of Department Name: Dr. Safanah Mudheher Raafat

Date: 7/4/2024

Signature:

Scientific Associate Name: Prof. Dr. Abbas H. Iss

Date: 8/4/2024

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department: Prof. Shaymaa M. Mahdi

Date:

Signature:

Approval of the Dean

Dr. Azad Rahee

1. Program Vision

The future vision of the Mechatronics and Robotics Engineering branch within the Control and Systems Engineering Department at the University of Technology is to increase scientific knowledge of the aforementioned specialization by developing current curricula and keeping pace with emerging theoretical, practical and applied knowledge according to a vision that defines the community's need and the future industrial base of the country.

2. Program Mission

Preparing specialized engineering cadres capable of serving society with high efficiency, contributing to technological development, and striving to obtain international accreditation.

3. Program Objectives

1. To support the students to have a broad-based education in the basic principles of electrical, mechanical, computer engineering and robotics. Their knowledge enables them to solve a wide range of mechanical, electrical and software problems, allowing them to participate in and lead multidisciplinary design teams.
2. To prepare the students to cover multidisciplinary areas including engineering analysis and design; engineering mechanics; robotics and automatic control; signals and communication; electrical hardware and computer software.
3. To provide the students with the capability to understand and analyze engineering problems which encounter them in the workplace such as manufacturers in industry, in the aerospace and also in the defense sectors for the government and industry research groups.
4. To enhance the students to learn and solve complex problem from different fields with the team members to communicate effectively.

4. Program Accreditation

ABET
Iraqi Council of Accreditation for engineering education

5. Other external influences

Not Found

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	67	142	100%	-
College Requirements	67	142	100%	-
Department Requirements	67	142	100%	-
Summer Training	Available	-	-	-
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
2023-2024/First	DCEC111	DC Electrical Circuits	3	2
2023-2024/First	MATH112	Mathematics	4	-
2023-2024/First	COMP108	Computer	1	2
2023-2024/First	ENDR114	Engineering Drawing	-	3
2023-2024/First	ELPH115	Electronic Physics	3	-
2023-2024/First	WSHE106	Workshops	-	6
2023-2024/First	DEHR105	Democracy and Human Rights	2	-
2023-2024/First	ACEC121	AC Electrical Circuits	3	2
2023-2024/First	CALC122	Calculus	4	-
2023-2024/First	COPR123	Computer	3	2

		Programming		
2023-2024/First	CAED124	Computer Aided Engineering Drawing	-	3
2023-2024/First	ENLA107	English Language	2	-
2023-2024/First	WSHE106	Workshops	-	6
2023-2024/Second	HURIG101	Human Rights	2	-
2023-2024/ Second	DCEMA102	DC Electrical Machines	2	-
2023-2024/ Second	MECHA103	Mechanics	2	-
2023-2024/ Second	DIGTE104	Digital Techniques 1	3	-
2023-2024/ Second	ELECT105	Electronics 1	2	-
2023-2024/ Second	ENMAT106	Engineering Mathematics 1	2	-
2023-2024/ Second	CONTH107	Control Theory 1	2	-
2023-2024/ Second	MEAIN108	Measurements and Instrumentation 1	2	-
2023-2024/ Second	DYNAM110	Dynamics 1	2	-
2023-2024/ Second	ENMAT206	Engineering Mathematics 2	2	-
2023-2024/ Second	CONTH207	Control Theory 2	2	-
2023-2024/ Second	DIGTE204	Digital Techniques 2	3	-
2023-2024/ Second	ELECT205	Electronics 2	2	-
2023-2024/ Second	ACEMA202	AC Electrical Machines	2	-
2023-2024/ Second	PROG209	Programming with MATLAB	2	-
2023-2024/ Second	MEAIN108	Measurements and Instrumentation 2	2	-
2023-2024/ Second	-	Laboratories 2	-	8
2023-2024/Third	PLCO1332	Programmable Logic Controller 1	2	-
2023-2024/Third	ECCD3302	Electronic Circuits Design 1	2	-
2023-2024/Third	MRTE1302	Microprocessor Techniques	2	-
2023-2024/Third	FCOM1333	Fundamentals of Communications	2	-
2023-2024/Third	EANA1301	Engineering Analysis	2	-
2023-2024/Third	COTH1306	Control Theory 3	2	-
2023-2024/Third	DYNM3354	Dynamics 2	2	-
2023-2024/Third	FLPO3353	Fluid Power	2	-
2023-2024/Third	-	Laboratories 1	-	6
2023-2024/Third	PLCO1332	Programmable Logic Controller 2	2	-

2023-2024/Third	DSPR1339	Digital Signal Processing	2	-
2023-2024/Third	MICO1356	Microcontrollers and Embedded Systems	2	-
2023-2024/Third	NUAN1336	Numerical Analysis using MATLAB	2	-
2023-2024/Third	COTH1353	Control Theory 4	2	-
2023-2024/Third	ECCD3303	Electronic Circuits Design 2	2	-
2023-2024/Third	THMA3357	Theory of Machines	2	-
2023-2024/Third	ENMM3356	Engineering Materials and Manufacturing Processes	2	-
2023-2024/Third	–	Laboratories 2	-	6
2023-2024/Fourth	MECH4261	Mechanical Design	2	-
2023-2024/ Fourth	MSDE3459	Mechatronic Systems Design 1	1	2
2023-2024/ Fourth	COIN1405	Computer Interfacing	2	-
2023-2024/ Fourth	ROIS3464	Robotics and Intelligent Systems	3	-
2023-2024/ Fourth	DICO3460	Digital Control	2	-
2023-2024/ Fourth	MOCO3462	Modern Control 1	2	-
2023-2024/ Fourth	ARIR3463	Artificial Intelligence for Robotics	2	-
2023-2024/ Fourth	-	Laboratories 1	-	2
2023-2024/ Fourth	POWE4267	Power Electronics	2	-
2023-2024/ Fourth	INDE1401	Industrial Engineering	2	-
2023-2024/ Fourth	MSDE3459	Mechatronic System Design 2	1	2
2023-2024/ Fourth	SYID3465	System Identification	2	-
2023-2024/ Fourth	ROAU3464	Robotics and Automation	3	-
2023-2024/ Fourth	GPRO3461	Project	2	4
2023-2024/ Fourth	MOCO3462	Modern Control 2	2	-
2023-2024/ Fourth	DMRO3458	Design and Manufacturing of Robots	2	-
2023-2024/ Fourth	-	Laboratories 2	-	2

8. Expected learning outcomes of the program

<table>
<tr><td colspan="2">Knowledge</td></tr>
<tr><td>A1- Introducing the student to mechatronics engineering theories
A2- Enabling the student to know and understand the applications of practical scientific theories in the field of mechatronics engineering
A3- Enabling the student to choose optimal solutions to problems in the field of mechatronics engineering.</td><td>1- Mid Exams
2- Quizez
3- Discussions
4- Homework’s</td></tr>
<tr><td colspan="2">Skills</td></tr>
<tr><td>B1- Analysis</td><td rowspan="3">1- Mid Exams
2- Quizez
3- Discussions
4- Homework’s</td></tr>
<tr><td>B2- Design</td></tr>
<tr><td>B3- Implementation</td></tr>
<tr><td colspan="2">Ethics</td></tr>
<tr><td>C1- Motivate and urge the student to understand and assimilate the theoretical material and encourage him to design and implement special engineering designs in the mechatronics engineering branch.</td><td rowspan="2">The student's skills are evaluated by how to find the engineering problem and how to find the engineering solution to it at the lowest cost, with the highest possible cost, and with the least possible error.</td></tr>
<tr><td>C2- Encouraging collective work in the form of a team through discussions, group solutions, and participation in the annual exhibition for the manufacture of special devices in the mechatronics engineering branch.</td></tr>
</table>

9. Teaching and Learning Strategies

- Theoretical lectures, practical laboratory experiments, preparing reports, discussion, training, scientific visits, preparing research and participating in scientific conferences and exhibitions.
- Solve mathematical problems.
- Preparing algorithms and implementing them using computers.
- Using modern software and means of communication such as the Internet for information and research.

10. Evaluation methods

- Showing Specific Problem
- Discussions
- Meetings

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
أ.د. سفانة مظهر رأفت محمود	هندسة السيطرة والنظم	هندسة سيطرة واتمتة	–	–	√	–
أ.د. احمد ابراهيم عبد الكريم احمد	هندسة السيطرة والنظم	هندسة الانظمة الذاتية والانسان الالي	–	–	√	–

–	√	–	–	ميكانيك حياتي	هندسة ميكانيكية	أ.د. سليم خليفة كاظم اكسارة
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	أ.م.د. لمى عيسى عبد الكريم علي
–	√	–	–	نظم ديناميكية	رياضيات	أ.م.د. زينة خليل عبد الامير باقر
–	√	–	–	الادارة الهندسية	هندسة السيطرة والنظم	أ.م.د. حذيفة خليل ابراهيم كاظم
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	م.د. زينب صباح محمدامين عبدعلي
–	√	–	–	مواد معادن	هندسة الانتاج والمعادن	م.د. محمد نوري رضا علي
–	√	–	–	هندسة اتصالات الجوالة	هندسة الكترونيك واتصالات	م.د.حيدر دعامي رسن علي
–	√	–	–	تقنيات انظمة سيطرة	تقنيات هندسة السيطرة	م.د.مهند نوفل مصطفى حمد
–	√	–	–	هندسة الليزر	هندسة الليزر والالكترونيات البصرية	م.د. قمر قاسم محمد جواد
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	أ. شيماء محمود مهدي عبد
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	أ.م. ايفان ايشو كوريال ايشو

–	√	–	–	هندسة الكهربائية	كهرباء وتربية	م. بيداء هاشم هلال خضير
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	م. عبير فاضل شمال باش اغا
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	م. ناهدة ناجي كاظم زبالة
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	م. بشار فاتح مدحت فضيل
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	م. ليث خميس مجيد محمد
–	√	–	–	اللغة انكليزية	اداب	م.م. سمية فليح حسن احمد
–	√	–	–	هندسة سيطرة	هندسة طيران	م.م. مازن نجيب اجاويد
–	√	–	–	هندسة سيطرة	هندسة السيطرة والنظم	م.م. رشا محمد ناجي ذياب
–	√	–	–	اقتصاديات التعليم	اقتصاد عام	م.م. عمر فاضل حمد سلمان
–	√	–	–	هندسة ميكاترونكس	هندسة السيطرة والنظم	م.م. عطارد خضير احمد سالم
–	√	–	–	ميكانيك تطبيقي	هندسة ميكانيكية	م.م. رسل عادل كاظم جبار

Professional Development
Mentoring new faculty members
1. Enter the classroom with former faculty members for two months as an observer. 2. Contributing to publishing research in local, regional and international journals for the purpose of fulfilling the requirements for scientific promotion. 3. Encouraging new faculty members to complete their graduate studies within their specialty. 4. Developing the faculty member's skills in teaching, learning, and managing the educational process. 5. Participation in scientific conferences, seminars, workshops and scientific exhibitions.
Professional development of faculty members
1. Contributing to publishing research in local, regional and international journals for the purpose of fulfilling the requirements for scientific promotion. 2. Encouraging new faculty members to complete their graduate studies within their specialty. 3. Developing the faculty member's skills in teaching, learning, and managing the educational process. 4. Participation in scientific conferences, seminars, workshops and scientific exhibitions.

12. **Acceptance Criterion**
1- Central admission plan standard. 2- Admission of the top graduates to the institutes.

13. **The most important sources of information about the program**
Methodical books and lectures by teachers collected from various sources.

14. Program Development Plan
This is done through periodic review of curricula and review of scientific developments in the field of mechatronics and robotics engineering

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3		B1	B2	B3		C1	C2		
First	DCEC111	DC Electrical Circuits	Basic		X			X					X		
	MATH112	Mathematics	Basic	X						X					
	COMP108	Computer	Basic	X					X				X		
	ENDR114	Engineering Drawing	Basic					X					X		
	ELPH115	Electronic Physics	Basic		X					X			X		
	WSHE106	Workshops	Basic						X						
	DEHR105	Democracy and Human Rights	Basic										X		
	ACEC121	AC Electrical	Basic		X			X					X		

		Circuits													
	CALC122	Calculus	**Basic**	**X**						**X**					
	COPR123	Computer Programming	**Basic**	**X**					**X**				**X**		
	CAED124	Computer Aided Engineering Drawing	**Basic**					**X**					**X**		
	ENLA107	English Language	**Basic**										**X**		
	WSHE106	Workshops	**Basic**						**X**						
Second	HURIG101	Human Rights	**Basic**										**X**		
	DCEMA102	DC Electrical Machines	**Basic**		**X**				**X**						
	MECHA103	Mechanics	**Basic**		**X**				**X**						
	DIGTE104	Digital Techniques	**Basic**		**X**		**X**				**X**				

		1													
	ELECT105	Electronics 1	**Basic**		**X**		**X**	**X**			**X**				
	ENMAT106	Engineering Mathematics 1	**Basic**			**X**				**X**					
	CONTH107	Control Theory 1	**Basic**	**X**	**X**					**X**		**X**			
	MEAIN108	Measurements and Instrumentation 1	**Basic**		**X**					**X**		**X**			
	LABR2260	Laboratories 1	**Basic**	**X**	**X**				**X**						
	DYNAM110	Dynamics 1	**Basic**	**X**						**X**			**X**		
	ENMAT206	Engineering Mathematics 2	**Basic**			**X**				**X**					
	CONTH207	Control Theory 2	**Basic**	**X**	**X**					**X**		**X**			
	DIGTE204	Digital	**Basic**		**X**		**X**				**X**				

		Techniques 2													
	ELECT205	Electronics 2	**Basic**		**X**		**X**	**X**			**X**				
	ACEMA202	AC Electrical Machines	**Basic**		**X**				**X**						
	PROG209	Programming with MATLAB	**Basic**			**X**									
	MEAIN108	Measurements and Instrumentation 2	**Basic**		**X**					**X**		**X**			
	LABR2260	Laboratories 2	**Basic**	**X**	**X**				**X**						
Third	PLCO1332	Programmable Logic Controller 1	**Basic**		**X**			**X**	**X**				**X**		
	ECCD3302	Electronic Circuits Design 1	**Basic**		**X**			**X**	**X**				**X**		

	MRTE1302	Microprocessor Techniques	**Basic**		**X**			**X**	**X**				**X**		
	FCOM1333	Fundamentals of Communications	**Basic**		**X**					**X**			**X**		
	EANA1301	Engineering Analysis	**Basic**			**X**				**X**					
	COTH1306	Control Theory 3	**Basic**	**X**	**X**					**X**			**X**		
	DYNM3354	Dynamics 2	**Basic**	**X**						**X**			**X**		
	FLPO3353	Fluid Power	**Basic**			**X**				**X**					
	LABR3260	Laboratories 1	**Basic**	**X**	**X**				**X**						
	PLCO1332	Programmable Logic Controller 2	**Basic**		**X**			**X**	**X**				**X**		
	DSPR1339	Digital Signal Processing	**Basic**		**X**					**X**			**X**		

	MICO1356	Microcontrollers and Embedded Systems	**Basic**		**X**			**X**	**X**				**X**		
	NUAN1336	Numerical Analysis using MATLAB	**Basic**			**X**				**X**					
	COTH1353	Control Theory 4	**Basic**	**X**	**X**					**X**			**X**		
	ECCD3303	Electronic Circuits Design 2	**Basic**		**X**			**X**	**X**				**X**		
	THMA3357	Theory of Machines	**Basic**		**X**			**X**		**X**					
	ENMM3356	Engineering Materials and Manufacturing Processes	**Basic**		**X**					**X**			**X**		
	LABR3260	Laboratories 2	**Basic**	**X**	**X**				**X**						

Fourth	MECH4261	Mechanical Design	**Basic**		**X**					**X**		**X**	**X**		
	MSDE3459	Mechatronic Systems Design 1	**Basic**		**X**	**X**		**X**	**X**	**X**		**X**	**X**		
	COIN1405	Computer Interfacing	**Basic**		**X**			**X**	**X**				**X**		
	ROIS3464	Robotics and Intelligent Systems	**Basic**		**X**				**X**	**X**			**X**		
	DICO3460	Digital Control	**Basic**	**X**	**X**			**X**	**X**	**X**			**X**		
	MOCO3462	Modern Control 1	**Basic**	**X**	**X**			**X**	**X**	**X**			**X**		
	ARIR3463	Artificial Intelligence for Robotics	**Basic**		**X**				**X**				**X**		
	LABR4260	Laboratories 1	**Basic**	**X**	**X**				**X**						
	POWE4267	Power Electronics	**Basic**	**X**	**X**			**X**	**X**	**X**			**X**		

	INDE1401	Industrial Engineering	**Basic**							**X**					
	MSDE3459	Mechatronic System Design 2	**Basic**		**X**	**X**		**X**	**X**	**X**		**X**	**X**		
	SYID3465	System Identification	**Basic**		**X**				**X**	**X**			**X**		
	ROAU3464	Robotics and Automation	**Basic**		**X**	**X**		**X**	**X**				**X**		
	GPRO3461	Project	**Basic**		**X**	**X**		**X**	**X**	**X**		**X**	**X**		
	MOCO3462	Modern Control 2	**Basic**	**X**	**X**			**X**	**X**	**X**			**X**		
	DMRO3458	Design and Manufacturing of Robots	**Basic**		**X**				**X**				**X**		
	LABR4260	Laboratories 2	**Basic**	**X**	**X**				**X**						