

Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation
International Accreditation Dept.

*Academic Program Specification Form
For the Academic Year 2020-2021*

*University of Technology
College: Control and Systems Engineering
Number Of Departments In The College: Three
Date Of Form Completion: 9-6-2021*

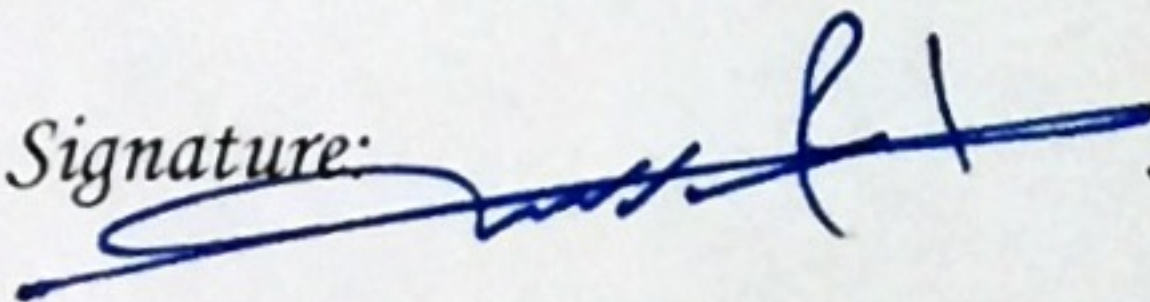
Dean ' s Name:

Assist. Prof. Dr.

Ahmed Ibraheem bdukgareem

Date: 9 / 6 / 2021

Signature:



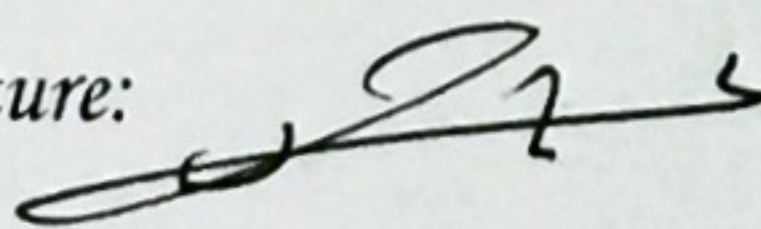
*Dean ' s Assistant for
Scientific Affairs:*

Prof. Dr.

Mohammed Yousif Hassan

Date: 9 / 6 / 2021

Signature:



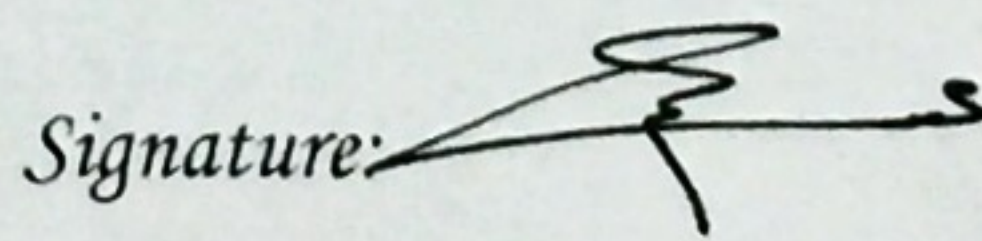
*The College Quality Assurance and
University Performance Manager:*

Assist. Prof.

Shaymaa Mahmood Mahdi

Date: 9 / 6 / 2021

Signature:



TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This academic program description provides a requisite summary of the most important characteristics of the program and the learning outcomes expected of the student to achieve, proving whether he has made maximum use of the available opportunities. It is accompanied by a description of each course within the program.

1. Teaching Institution	Ministry of Higher Education & Scientific Research
2. University Department/Centre	University of Technology/ Control and Systems Engineering Department
3. Program Title	Control Engineering Branch
4. Title of Final Award	Bachelor of Science in Mechatronics and Robotics Engineering
5. Modes of Attendance offered	The first stage, the second stage, the third and the fourth: the semester system (courses)
6. Accreditation	ABET
7. Other external influences	
8. Date of production/revision of this specification	9-6-2021
9. Aims of the Program	<p>The program aims to graduate engineering cadres specialized in the field of Mechatronics and Robotics Engineering.</p> <p>The Mechatronics and Robotics Engineering Branch aims to provide students of the initial study with topics related to all areas of Mechatronics and Robotics Engineering and according to international standards.</p> <p>Graduating engineers in the field of Mechatronics and Robotics Engineering for the purpose of engaging them in work and developing the Iraqi industry.</p> <p>The research interest of this branch is related to all fields related to the science of Mechatronics and Robotics Engineering, including but not limited to the fields related to robotics, artificial intelligence, computer control engineering, modern control, neural networks, fuzzy logic and genetic algorithm.</p>

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

- A1- Introducing the student to the theories of mechatronics engineering
- A2- Enabling the student to know and understand the practical scientific theories applications in the field of mechatronics engineering
- A3 - Enable the student to choose optimal solutions to problems in the field of mechatronics engineering.

B. Subject-specific skills

- B1: Design
- B2: Implementation
- B3: Analysis

Teaching and Learning Methods

Giving lectures, dialogue, discussion, scientific visits, workshops, seminars

Assessment methods

- 1- Semester exams
- 2- sudden exams
- 3- Discussions
- 4- Homework

C- Emotional and value goals.

C1- Motivating and urging the student to understand and comprehend the theoretical material and encouraging him to design and implement special engineering designs in the mechatronics engineering branch.

C2 - Encouraging teamwork and in the form of a team work through discussions and collective solutions and participation in the annual exhibition for the manufacture of special devices in the branch of mechatronics engineering.

Teaching and Learning Methods

Linking theoretical material with laboratory material on how to design and analyze special engineering problems in mechatronics engineering.

Assessment methods

The skills of the student are evaluated through how to find the engineering problem and how to find the engineering solution to it at the lowest cost, all the high and the least possible error.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1: The ability to work in groups to accomplish a specific task.

D2: The ability to communicate scientifically with the latest developments in the field

Mechatronics Engineering.

D 3: Using modern means, techniques and equipment.

D 4: The possibility of self-development and keeping abreast of the latest developments.

Teaching and Learning Methods

Seminars, workshops, scientific visits, completion of work within a work team.

Assessment Methods

Discussion, presentation of a specific problem, seminars

Program Structure .1

Credit hours			Course Name	Core/ Elective	Pre- requisite	Course Code	stage school
Prac.	Theo.	Totu.					
	2		English Language 1	Core-U	-----	ENGL102	First
	2		English Language 2	Core-U	English Language 1	ENGL106	First
	3	1	Mathematics 1	Core-D	-----	MAT1111	First
	3	1	Mathematics 2	Core-D	Mathematics 1	MAT2116	First
	3		Electronic Physics 1	Core-D	-----	ELP1113	First
	3		Electronic Physics 2	Core-D	Electronic Physics 1	ELP2118	First
2	2	1	Fundamentals of Electrical Engineering 1	Core-D	-----	EEN1112	First
2	2	1	Fundamental of Electrical Engineering 2	Core-D	Fundamentals of electrical engineering 1	EEN2117	First
3			Engineering Drawing 1	Core-D	-----	END1114	First
3			Engineering Drawing 2	Core-D	Engineering drawing 1	END2119	First
6			Workshops 1	Core-U	-----	WRKS101	First
6			Workshops 2	Core-U	Workshops 1	WRKS105	First
2	1		Computer Science	Core-U	-----	COMP104	First
2	1		Computer Fundamentals & Programming 1	Core-B	Computer science	CFP1115	First
	2		Human Rights		HURI203		Second
	2		Mechanics		MECH205		Second
	3		Digital Techniques 1		DIT1206		Second
	3		Digital Techniques II		DIT2206		Second
	2		Engineering Mathematics I		ENM1208		Second
	2		Engineering Mathematics II		ENM2208		Second
	2		Programming (MATLAB)		PRMA201		Second
	2		DC Electrical Machines		DCEM204		Second
	2		AC Electrical Machines		ACEM204		Second
	2		Electronics I		ELE1207		Second
	2		Electronics II		ELE2207		Second
	2		Control Theory I		CONT1206		Second
	2		Control Theory II		CONT2206		Second
	2		Measurements and		MEI1209		Second

		Instrumentation I		
	2	Measurements and Instrumentation II	MEI2209	Second
	2	Dynamics I	DYN1202	Second
4		Laboratories I	CSE-M2303	Second
4		Laboratories II	CSE-M2304	Second
	2	Engineering Analysis	CSE3301	Third
	2	Numerical Analysis Using Matlab	CSE3302	Third
	2	Microprocessor Techniques I	CSE3303	Third
	2	Microprocessor Techniques II	CSE3304	Third
	2	Control Theory III	CSE-C3302	Third
	2	Control Theory IV	CSE-C3303	Third
	2	Electronic Circuits Design I	CSE3305	Third
	2	Electronic Circuits Design II	CSE3306	Third
	2	Fundamentals of Communications	CSE3307	Third
	2	Digital Signal Processing	CSE3308	Third
	2	Engineering Materials and Manufacturing Processes	CSE-M3301	Third
	2	System Identification	CSE-C3304	Third
	2	Fluid Power (Hydraulic Systems)	CSE-M3302	Third
	2	Fluid Power (Pneumatic Systems)	CSE-M3303	Third
	2	Theory of Machines	CSE-M3304	Third
	2	Fundamentals of Vibration	CSE-M3305	Third
	2	Programmable Logic Controller I	CSE-M3306	Third
	2	Programmable Logic Controller II	CSE-M3307	Third
6		Laboratories I	CSE-M3308	Third
6		Laboratories II	CSE-M3309	Third

	2	Industrial Engineering	CSE-4301	Fourth
	2	Nanotechnology	CSE-4302	Fourth
	2	Automation and CNC Machines	CSE-M4301	Fourth
	2	Computer Interfacing	CSE-M4302	Fourth
	2	Microcontrollers	CSE-M4303	Fourth
	2	Modern Control I	CSE-C4303	Fourth
	2	Modern Control II	CSE-C4304	Fourth
	2	Power Electronics	CSE-M4304	Fourth
	2	Digital Control	CSE-M4305	Fourth
	2	Mechanical Design I	CSE-M4306	Fourth
	2	Mechanical Design II	CSE-M4307	Fourth
	2	Intelligent Control Systems	CSE-C4306	Fourth
	2	Robotics	CSE-M4308	Fourth
	2	Mobile Robots	CSE-M4309	Fourth
2	1	Mechatronic System Design I	CSE-M4310	Fourth
2	1	Mechatronic system Design II	CSE-M4311	Fourth
2		Laboratories I	CSE-M4313	Fourth

2		Laboratories II	CSE-M4314	Fourth
3	1	Project	CSE-M4312	Fourth

13. Personal Development Planning

This is done through the periodic review of the curricula and the latest scientific developments in the field of specialization of the branch.

14. Admission criteria.

1. The criteria are included in the central admission plan for each year.
2. Acceptance of the first to the institutes.

15. Key sources of information about the program

Curriculum books, teaching lectures collected from multiple sources, laboratories.

General and Transferable Skills (other skills relevant to employability and personal development)				Emotional and value goals		Program specific objectives			Knowledge and Understanding			Basic or optional	Course Name	Course Code	year/level
D4	D3	D2	D1	C2	C1	B3	B2	B1	A3	A2	A1				
				X								Core	English Language 1	ENGL 102	First
				X								Core	English Language 2	ENGL 106	
		X				X					X	Core	Mathematics 1	MAT 1111	
		X				X					X	Core	Mathematics 2	MAT 2116	
		X		X		X				X		Core	Electronic Physics 1	ELP 1113	
		X		X		X				X		Core	Electronic Physics 2	ELP 2118	
	X			X				X		X		Core	Fundamentals of Electrical Engineering 1	EEN 1112	
	X			X				X		X		Core	Fundamentals of Electrical Engineering 2	EEN 2117	
			X	X				X				Core	Engineering Drawing 1	END 1114	
			X	X				X				Core	Engineering Drawing 2	END 2119	
							X					Core	Workshops 1	WRKS 101	
							X					Core	Workshops 2	WRKS 105	
		X		X		X					X	Core	Computer science	COMP 104	
		X		X		X					X	Core	Computer Fundamentals & programming 1	CFP 1115	

				X									Core	Human Rights	HURI203	Second		
						X					X		Core	Mechanics	MECH205			
X		X		X				X			X		Core	Digital Techniques 1	DIT1206			
X		X		X				X			X		Core	Digital Techniques II	DIT2206			
X			X			X				X			Core	Engineering Mathematics I	ENM1208			
X			X			X				X			Core	Engineering Mathematics II	ENM2208			
	X									X			Core	Programming (MATLAB)	PRMA201			
X						X					X		Core	DC Electrical Machines	DCEM204			
X						X					X		Core	AC Electrical Machines	ACEM204			
X				X			X	X			X		Core	Electronics I	ELE1207			
X				X			X	X			X		Core	Electronics II	ELE2207			
		X		X		X					X	X	Core	Control Theory I	CONT1206			
		X		X		X					X	X	Core	Control Theory II	CONT2206			
		X		X		X					X		Core	Measurements and Instrumentation I	MEI1209			
		X		X		X					X		Core	Measurements and Instrumentation II	MEI2209			
		X		X		X						X	Core	Dynamics I	DYN1202			
	X		X				X				X	X	Core	Laboratories I	CSE-M2303			
	X		X				X				X	X	Core	Laboratories II	CSE-M2304			
X			X			X				X			Core	Engineering Analysis	CSE3301		Third	
X			X			X				X			Core	Numerical Analysis Using Matlab	CSE3302			
	X			X			X	X			X		Core	Microprocessor Techniques I	CSE3303			
	X			X			X	X			X		Core	Microprocessor Techniques II	CSE3304			
x		X		X		X					X	X	Core	Control Theory III	CSE-C3302			
x		X		X		X					X	X	Core	Control Theory IV	CSE-C3303			

X	X			X		X	X			X		Core	Electronic Circuits Design I	CSE3305	
X	X			X		X	X			X		Core	Electronic Circuits Design II	CSE3306	
X	X			X		X				X		Core	Fundamentals of Communications	CSE3307	
X	X			X		X				X		Core	Digital Signal Processing	CSE3308	
X	X			X		X				X		Core	Engineering Materials and Manufacturing Processes	CSE-M3301	
	X			X			X	X		X		Core	System Identification	CSE-C3304	
X			X			X			X			Core	Fluid Power (Hydraulic Systems)	CSE-M3302	
X			X			X			X			Core	Fluid Power (Pneumatic Systems)	CSE-M3303	
x		X				X		X		X		Core	Theory of Machines	CSE-M3304	
x		X				X		X		X		Core	Fundamentals of Vibration	CSE-M3305	
	X			X			X	X		X		Core	Programmable Logic Controller I	CSE-M3306	
	X			X			X	X		X		Core	Programmable Logic Controller II	CSE-M3307	
	X		X				X			X	X	Core	Laboratories I	CSE-M3308	
	X		X				X			X	X	Core	Laboratories II	CSE-M3309	
	X					X						Core	Industrial Engineering	CSE-4301	Fourth
X			X	X			X			X		Core	Nanotechnology	CSE-4302	
		X		X			X	X	X	X		Core	Intelligent Control Systems	CSE-C4306	
X				X			X			X		Core	Automation and CNC Machines	CSE-M4301	
X	X	X		X		X	X			X		Basic	Robotics	CSE-M4308	

X	X	X		X		X	X			X		Core	Mobile Robots	CSE-M4309
X	X			X	X	X				X		Core	Mechanical Design I	CSE-M4306
X	X			X	X	X				X		Core	Mechanical Design II	CSE-M4307
X	X	X		X		X	X	X		X	X	Core	Digital Control	CSE-M4305
	X		X	X			X	X		X		Core	Computer Interfacing	CSE-M4302
X			X	X	X	X	X	X	X	X		Core	Mechatronic system Design I	CSE-M4310
X			X	X	X	X	X	X	X	X		Core	Mechatronic system Design II	CSE-M4311
X	X	X	X	X	X	X	X	X	X	X		Core	Project	CSE-M4312
	X		X				X			X	X	Core	Laboratories I	CSE-M4313
	X		X				X			X	X	Core	Laboratories II	CSE-M4314
X	X	X		X		X	X	X		X	X	Core	Modern Control I	CSE-C4303
X	X	X		X		X	X	X		X	X	Core	Modern Control II	CSE-C4304
	X		X	X			X	X		X		Core	Microcontrollers	CSE-M4303
X	X			X		X	X			X		Core	Power Electronics	CSE-M4304