

**University of Baghdad/
Al-Khwarizmi College of
Engineering**



جامعة بغداد / كلية الهندسة الخوارزمي

*First Cycle – Bachelor's degree (B.Sc.) – Automated
Manufacturing Engineering*

بكالوريوس هندسة - هندسة تصنيع مؤتمت



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Mission & Vision Statement .1

Vision Statement

Our vision for the Automated Manufacturing Engineering Program is to empower students with the knowledge, skills, and mindset required to lead the transformation of manufacturing through automation and emerging technologies. We strive to cultivate a new generation of engineering professionals who are equipped to drive innovation, optimize processes, and enhance global competitiveness in the manufacturing industry. By integrating cutting-edge technologies, interdisciplinary collaboration, and hands-on experience, our program aims to shape future leaders capable of harnessing the power of automation, artificial intelligence, robotics, and data analytics to create sustainable, efficient, and agile manufacturing systems. Through our holistic education approach, we envision graduates who possess the ability to solve complex problems, make data-driven decisions, and adapt to evolving industry trends, ensuring their invaluable contribution to the advancement of automated manufacturing and its positive impact on society.

Mission Statement

Our mission is to provide a rigorous and comprehensive education in Automated Manufacturing Engineering that prepares students to excel as skilled professionals and innovators in the field. We are committed to cultivating a learning environment that fosters creativity, critical thinking, and collaboration, while instilling a strong foundation in engineering principles and practices. Through hands-on experiences, industry partnerships, and exposure to emerging technologies, we aim to equip students with the technical expertise, problem-solving abilities, and adaptability needed to tackle the

challenges of modern manufacturing. Our program is dedicated to promoting ethical and sustainable practices, empowering graduates to drive efficiency, productivity, and environmental stewardship in automated manufacturing processes. By fostering a culture of continuous learning and a deep understanding of the intersection between engineering and automation, we strive to produce professionals who contribute to the advancement and transformation of the manufacturing industry, making a positive impact on businesses, society, and the global economy.

Program Specification .2

Programme code:	BSc-AME	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

The Automated Manufacturing Engineering Program is a multidisciplinary field of study that combines engineering, robotics, automation, and data analytics to optimize and enhance manufacturing processes. It equips students with the knowledge and practical skills needed to design, implement, and manage automated systems in diverse industries. Through a hands-on approach, students gain expertise in areas such as robotics programming, control systems, data analysis, and emerging technologies. The program emphasizes the application of advanced automation techniques to increase efficiency, improve quality, and reduce costs in manufacturing operations. Graduates are prepared for rewarding careers in automation engineering, robotics, process improvement, and production management, where they can contribute to the advancement and transformation of the manufacturing industry.

Level 1 provides students with a solid foundation in core areas, blending technical knowledge, problem-solving abilities, communication skills, and an understanding of ethical and social considerations. These courses lay the groundwork for further studies in automated manufacturing engineering and prepare students for the challenges and opportunities in the field according to the college and department Mission statements.

Levels 2, 3, and 4 of the Automated Manufacturing Engineering Program progressively equip students with the specialized knowledge and practical skills needed to excel in the field of automated manufacturing engineering. Through a combination of theoretical coursework, hands-on projects, and practical experiences, students develop the expertise required to innovate, optimize, and lead in the automated manufacturing industry.

The research ethos is developed and fostered from the start via practical, which are either embedded in lecture modules or taught in dedicated practical modules, research seminars and tutorials. There is a compulsory field course in each Level, which students must pass in order to progress into another courses in next Levels. At Level 4 all students carry out an independent research project, which have 10 ECTS.

Academic tutorials are held at all Levels, providing continuity and progressive guidance, e.g. assessed exercises, essays and talks, as opportunities to practice these skills in a subject-specific context.

Program Objectives .3

1- Develop Technical Expertise: The program aims to provide students with a strong technical foundation in automated manufacturing engineering. This includes knowledge of engineering principles, automation technologies, robotics, control systems, data analytics, and manufacturing processes.

2- Foster Problem-Solving Skills: The program aims to cultivate students' ability to identify and solve complex problems in automated manufacturing. This involves developing critical thinking, analytical reasoning, and troubleshooting skills to address challenges related to system design, optimization, and operation.

3- Enhance Practical Skills: The program focuses on equipping students with hands-on experience in working with automated manufacturing systems. This includes practical skills such as programming industrial robots, integrating sensors and actuators, designing control systems, and optimizing production lines.

4- Promote Interdisciplinary Collaboration: The program encourages collaboration and interdisciplinary approaches by providing opportunities for students to work in teams with colleagues from different fields. This fosters effective communication, teamwork, and the ability to integrate diverse perspectives to address complex manufacturing challenges.

5- Instill Ethical and Sustainable Practices: The program emphasizes the importance of ethical and sustainable practices in automated manufacturing. This includes considerations for worker safety, environmental impact, and ethical decision-making in the design and operation of automated systems.

6- Foster Innovation and Adaptability: The program aims to nurture a mindset of innovation and adaptability in students. This involves exposure to emerging technologies, such as artificial intelligence, additive manufacturing, and Internet of Things, and encouraging students to explore new approaches and ideas to drive continuous improvement and innovation in automated manufacturing.

7- Prepare for Professional Careers: The program's objective is to prepare students for successful careers in automated manufacturing engineering. This includes equipping them with the knowledge, skills, and industry-relevant experience needed to pursue roles such as automation engineer, robotics specialist, manufacturing systems engineer, process improvement engineer, or production manager.

By achieving these objectives, an Automated Manufacturing Engineering Program seeks to produce graduates who are well-prepared to contribute to the advancement, optimization, and innovation of automated manufacturing systems in various industries.

Student Learning Outcomes .4

The Student Learning Outcomes (SLOs) of a B.Sc. program in Automated Manufacturing Engineering can be summarized as follows:

Outcome 1

Technical Knowledge

Graduates will possess a solid understanding of the principles, theories, and concepts related to automated manufacturing engineering. They will have knowledge of manufacturing processes, robotics, control systems, CAD/CAM, industrial automation, and other relevant areas.

Outcome 2

Design and Analysis

Students will develop the ability to design and analyze automated manufacturing systems. They will learn how to integrate various components and subsystems, optimize manufacturing processes, and evaluate system performance.

Outcome 3

Programming and Automation

Graduates will acquire skills in programming and automation technologies. They will be proficient in programming languages used in industrial automation, such as PLC (Programmable Logic Controller) programming, and understand the fundamentals of robotics programming.

Outcome 4

Problem-solving

Students will develop problem-solving skills applicable to automated manufacturing engineering. They will learn to identify and analyze manufacturing issues, propose effective solutions, and make informed decisions in complex technical situations.

Outcome 5

Teamwork and Communication

Graduates will be able to effectively collaborate with multidisciplinary teams and communicate technical information clearly and concisely. They will develop skills in teamwork, leadership, and interpersonal communication.

Outcome 6

Professionalism and Ethics

Students will understand the ethical, societal, and environmental responsibilities associated with automated manufacturing engineering. They will demonstrate professionalism, integrity, and an understanding of the impact of their work on society and the industry.

Outcome 7

Continuous Learning

Graduates will have a commitment to lifelong learning and professional development. They will be prepared to adapt to advancements in technology, stay updated with industry trends, and engage in self-directed learning to enhance their knowledge and skills.

Academic Staff .5

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Credits, Grading and GPA .6

Credits

University of Baghdad is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

- The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$\text{CGPA} = [(1\text{st module score} \times \text{ECTS}) + (2\text{nd module score} \times \text{ECTS}) + \dots] / 240$$

Curriculum/Modules .7

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AME111	General Physics	78	72	6.00	B	
AME112	Computer Application	78	72	6.00	S	
AME113	Engineering Drawing	48	102	6.00	S	
AME114	Human Rights and General Freedom	48	52	4.00	S	
AME115	Arabic Language	48	52	4.00	S	
AME116	Engineering Workshop I	48	52	4.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AME121	Engineering Mathematics I	93	32	5.00	B	
AME122	Computer Programming I	78	47	5.00	S	
AME123	Electrical Circuits	93	57	6.00	S	
AME124	Engineering Mechanics (Statics)	93	57	6.00	S	
AME125	English Language I	63	37	4.00	S	
AME126	Engineering Workshop II	48	52	4.00	S	AME116

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AME211	Engineering Mathematics II	93	32	5.00	B	AME121
AME212	Mechanical Drawing I	48	102	6.00	S	AME113
AME213	Engineering Materials	93	32	5.00	S	
AME214	Engineering Mechanics (Dynamics)	93	57	6.00	S	

AME215	Thermodynamics	48	52	4.00	S	
AME216	English Language II	63	37	4.00	S	AME125

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AME221	Engineering and Numerical Analysis	78	47	5.00	B	AME211
AME222	Mechanical Drawing II	48	77	5.00	S	AME212
AME223	Mechanics of Materials	63	62	5.00	S	AME124
AME224	Computer Programming II	78	47	5.00	S	AME122
AME225	Electronics	93	32	5.00	S	
AME226	Logic Circuit Design	63	62	5.00	C	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AME311	Manufacturing Processes I	48	77	5.00	C	
AME312	Automation Process Design	63	62	5.00	C	
AME313	Computer Aided Design	63	62	5.00	C	
AME314	Fluid Mechanics	48	77	5.00	S	
AME315	Microprocessors and Microcontroller	93	32	5.00	C	AME225 AME226
AME316	Theory of Machine	93	32	5.00	C	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AME321	Manufacturing Processes II	63	62	5.00	C	AME311
AME322	Vibration	93	32	5.00	C	
AME323	Computer Aided Manufacturing	63	62	5.00	C	AME313
AME324	Engineering Statistics	63	62	5.00	B	
AME325	Engineering Measurement and Instrumentation	63	62	5.00	C	
AME326	Programmable Logic Circuits	63	62	5.00	C	AME123

						AME225 AME226
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Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AME411	Manufacturing Systems	63	62	5.00	C	
AME412	Network System Automation	63	62	5.00	C	AME326
AME413	Elective I	48	77	5.00	E	
AME414	Robotics	78	47	5.00	C	AME214 AME313 AME316
AME415	Control Systems Engineering	78	47	5.00	C	AME221
AME416	Engineering Project I	63	62	5.00	C	

Elective I
Projects Management Plan
Engineering Economics
Entrepreneurship

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AME421	Manufacturing Automation	63	62	5.00	C	AME312
AME422	Machine Design	63	62	5.00	C	AME223
AME423	Elective II	63	62	5.00	E	
AME424	Micro Electro Mechanical Systems	63	62	5.00	C	AME311 AME321
AME425	Artificial Intelligence	63	62	5.00	C	AME122 AME224
AME426	Engineering Project II	63	62	5.00	C	AME416

Elective II
Computer Integrated Manufacturing
Industrial Engineering
Computer Aided Engineering

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