



الملحق رقم (٢)
دليل البرنامج الأكاديمي هندسة الذكاء الاصطناعي
والانسان الآلي

Program Catalog for AI & Robotics
Engineering

Al-Iraqia University الجامعة العراقية



Bachelor's degree (B.Sc.) – AI & Robotics Engineering

بكالوريوس علوم - هندسة الذكاء الاصطناعي والانسان الآلي



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1. **Mission & Vision Statement**

Vision Statement

Vision Statement: To be a leading department in Artificial Intelligence and Robotics Engineering, reaching competitive levels locally, regionally, and internationally. We are committed to delivering high-quality education that fosters a deep understanding of AI and robotics principles, theory, and practice. We aim to be a specialized hub for research and development, contributing to a leading scientific and technical knowledge climate. We embrace diversity and strive to create an inclusive environment that fosters collaboration, mutual respect, and equal opportunities for all, believing this enhances creativity and enriches the learning experience. We also encourage an entrepreneurial mindset and leadership qualities, supporting our students in transforming their ideas into viable solutions.

Mission Statement

We aspire to prepare a distinguished and creative engineer equipped with a rigorous and up-to-date academic and technical education that keeps pace with advancements in AI and robotics. We foster a culture of research and innovation, encouraging faculty and students to engage in cutting-edge projects to face industrial and societal challenges. We build qualified engineering cadres with the necessary skills for innovation by establishing strong partnerships with industry leaders for internships and collaborative research, bridging the gap between academia and industry. We are dedicated to the professional growth of our students and faculty, offering mentorship and development opportunities to effectively contribute to the national economy and scientific research.

2. **Program Specification**

Program code:	BSc-AI&R	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

1. **Program Title:** Bachelor of Science in Artificial Intelligence and Robotics Engineering.

2. **Program Objectives:**

- To provide students with a solid foundation in mathematics, science, and engineering principles necessary for AI and robotics.
- To develop students' analytical, problem-solving, and critical-thinking skills applicable to complex intelligent systems.

- To equip students with knowledge and practical experience in designing, implementing, and testing AI models, robotic platforms, and autonomous solutions.
- To prepare students for successful careers in AI, robotics, and related high-tech fields.
- To foster an understanding of ethical, societal, and professional responsibilities in the field of artificial intelligence.

3. **Program Duration:** 4 years (8 semesters).

4. **Curriculum Structure:**

- **General Education Courses:** Covers subjects including mathematics, physics, and engineering sciences, providing a broad educational foundation.
- **Core AI & Robotics Courses:** Forms the backbone of the program, covering topics such as: Data Structures, Machine Learning, Deep Learning, Computer Vision, Natural Language Processing (NLP), Robotic Systems, Control Theory, and AI Ethics.
- **Elective Courses:** Students can choose specialized areas such as: Reinforcement Learning, Autonomous Navigation, Human-Robot Interaction, or AI in Healthcare.
- **Laboratory Courses:** Integrated labs provide hands-on experience in training models, building robots, and testing autonomous systems, reinforcing theoretical concepts.
- **Capstone Project:** In the final year, students undertake a significant project to solve a real-world problem or develop an innovative AI/Robotics solution, often in teams.

5. **Co-op/Internship Opportunities:** The program actively seeks co-op or internship opportunities with industry partners, allowing students to apply their knowledge in a professional setting.

6. **Assessment and Evaluation:** Student performance is assessed through examinations, assignments, projects, laboratory work, and presentations to ensure achievement of program outcomes.

7. **Accreditation:** The program will seek accreditation from relevant national and international bodies to ensure quality and alignment with global standards.

3. Program Goals

1. **Provide Strong Foundations:** Prepare specialized engineers with strong scientific skills (theoretical and practical) in AI and robotics, focusing on innovation, critical thinking, and problem-solving.
2. **Design and Implement Systems:** Enable students to design, develop, and implement complex intelligent and robotic systems, emphasizing performance, reliability, and safety.
3. **Enhance Scientific Research:** Promote a culture of scientific research and development in AI, machine learning, robotics, and automation, providing a supportive environment for applied research.
4. **Align with Labor Market:** Offer curricula that align with local and international labor market demands, focusing on practical applications and field training.
5. **Foster Partnerships:** Establish fruitful scientific and practical partnerships with tech companies and institutions to enhance collaboration between academia and industry.
6. **Promote Teamwork & Communication:** Foster effective teamwork and communication skills, promoting collaboration in project-based activities to reflect real-world industry scenarios.
7. **Ensure Continuous Learning:** Provide continuous training programs and instill habits of lifelong learning to help students adapt to emerging technologies.
8. **Support Entrepreneurship:** Encourage students and faculty to develop high-impact projects and support applied entrepreneurship to achieve economic growth.
9. **Serve the Community:** Contribute to finding applied technical solutions that improve quality of life in society (e.g., in health, agriculture, and industry).
10. **Foster Diversity and Inclusion:** Create a supportive and inclusive environment that values diversity, respects different perspectives, and encourages equal opportunities for all students.

4. Student Learning Outcomes:

Upon successful completion of the program, (what graduates can do at completion).

graduates will be able to:

1. Analyze complex engineering problems and apply principles of mathematics, AI, and robotics to identify and formulate solutions.
2. Design & Develop: Design, develop, implement, and evaluate intelligent systems, robotic platforms, or autonomous processes to meet specified needs.
3. Apply Foundations: Apply mathematical foundations, algorithmic principles, and engineering theory in the modeling and design of AI-based systems.
4. Conduct Experimentation: Conduct experiments, analyze and interpret data (including large datasets), and use engineering judgment to draw conclusions in the field of AI and robotics.
5. Utilize Modern Tools: Demonstrate proficiency in programming languages, software tools, and hardware platforms relevant to AI and robotics.
6. Integrate Systems: Integrate AI software components with robotic hardware, sensors, and actuators to create functional autonomous systems.
7. Communicate & Collaborate: Function effectively in multidisciplinary teams and communicate technical concepts clearly and professionally in oral and written forms.
8. Uphold Ethics: Understand and adhere to professional and ethical responsibilities, making informed judgments that consider the societal impact of AI and robotic solutions.
9. Engage in Research: Engage in research activities, including literature review, experimental design, and analysis, to contribute to the advancement of knowledge.
10. Engage in Lifelong Learning: Recognize the need for, and demonstrate an ability to engage in, continuous learning and adaptation to emerging technologies.

5. Program Educational Objectives (PEOs) — B.Sc. in AI & Robotics

Within 3–5 years of graduation, alumni will: (what alumni achieve a few years after graduation).

1. Practice & Technical Mastery

Apply mathematics, AI/ML, control, and systems engineering to **design, implement, integrate, and evaluate** intelligent and autonomous robotic systems using modern software/hardware tools and standards. *(Aligns with ABET 1,2,5)*

2. Complex Problem-Solving & Innovation

Analyze **complex, data-rich problems**, plan and conduct experiments, interpret results, and **create innovative AI/robotics solutions** that translate research into products, publications, or patents. *(Aligns with ABET 1,2,6,7)*

3. Ethics, Safety & Societal Impact

Exhibit **professional and ethical responsibility**, ensuring safety, privacy, security, and fairness in AI and robotic deployments; consider **societal, environmental, and regulatory** implications in decision-making. *(Aligns with ABET 4)*

4. Communication, Teamwork & Leadership

Lead and contribute effectively in multidisciplinary, multicultural teams; **communicate** technical concepts clearly to technical and non-technical audiences; manage projects and collaborate with industry and academia. *(Aligns with ABET 3,5)*

5. Lifelong Learning & Career Growth

Pursue **continuous learning** (graduate study, certifications like AI/ML, ROS, embedded systems), adapt to emerging technologies, and engage in professional communities and entrepreneurship. *(Aligns with ABET 7)*

6. Academic Staff

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7. Credits, Grading and GPA

Credits

Al-Iraqia University 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:

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

8. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
COPR108	Computer and programming	6	96	7.00	C	—
WORS109	Workshop	2	32	2.00	B	—
PHYS104	Physics	4	79	6.00	B	—
ENGI105	Engineering Drawing	4	34	2.00	B	—
MATH106	Mathematics I	4	79	6.00	B	—
CHEM107	Chemistry	4	64	5.00	B	—
ARLA101	Arabic Language I	4	34	2.00	S	—

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
HRAD103	Human Rights & Democracy	34	16	2.00	S	
MATH122	Mathematics II	79	46	5.00	B	MATH106
DISD124	Digital System Design	66	59	5.00	C	
MEEN125	Engineering Mechanics	64	61	5.00	C	PHYS104
PYPR126	Python programming	81	44	5.00	C	
ELCI127	Electrical Circuits	81	69	6.00	B	
ENLA102	English Language I	34	16	2.00	B	

9. **Contact**

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