

University of AL-Mustaqbal

College of Sciences

Intelligent Medical Systems

Department

جامعة المستقبل

كلية العلوم

قسم الانظمة الطبية الذكية



*First Cycle – Bachelor's degree (B.Sc.) – Bachelor of Science in
Intelligent Medical Systems*

بكالوريوس علوم - الانظمة الطبية الذكية

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1. Mission & Vision Statement

Vision Statement

The Intelligent Medical Systems Department is aspired to be a distinguished section of the local and international level in the field of supporting and developing health systems and developing scientific research and meeting the needs of government institutions and the labor market with the aim of improving the quality of the health care.

Leadership and excellence in developing an educational and research program in the field of biomedical informatics to meet the requirements of governmental institutions and the labor market at the local and international levels.

Mission Statement

The Department of Intelligent Medical Systems is a new specialty in Iraqi universities that links the specialty of information technology and medical information systems in order to prepare a distinguished graduate possess the skills needed to keep pace with advances in information technology and mastering them to medical and biological uses and who are qualified for competing in the labor market at the local and international levels.

Providing academic and qualitative programs to prepare graduates with high skills in the field of bioinformatics to be able to contribute in solving the problems of society of an interlaced nature between information technology and biomedical.

2. Program Specification

Program code	BSc-IMS	ECTS	240
Duration	4 level, 8 Semesters	Method of Attendance	Full Time

Intelligent medical systems, a field that is used in the development of smart medical technologies and systems, and the ability to keep pace with the rapid developments in modern digital medical technologies. Studying in this department we strive to enable students to design and innovate under the close mentorship of our world-class faculty. Our students learn by doing from their very first class, and quickly transition to authentic Technology projects with real-world corporate, government and nonprofit partners.

3. Program Goals

The Department of Intelligent Medical Systems seeks to prepare a distinguished graduate with the ability to:

1. Using and developing intelligent medical technologies and systems, and the ability to keep pace with the rapid developments in modern digital medical technologies, and competition in the labor market.
2. Assigning workers in the health field, including surgeons, analysts, and disease specialists, with systems that support their daily work and serve the achievement of results for medical diagnoses and analyzes in less time and with higher accuracy.
3. Collecting, discovering and analyzing medical data and knowing how to use it to serve scientific research and assist various agencies in achieving integrated health care.
4. Strengthening cooperation with interested sectors inside and outside Iraq.
5. Contributing to scientific research with various research ideas to assist to support and enhance the medical diagnosis systems.
6. Upgrading the student's personality by cultivating moral and human values and the national spirit and teaching them the skills of the art of leadership and searching for methods of solving problems and commitment to quality and professional behavior.
7. Providing students with the basic skills that enable them to deal with the environment and conditions of future work effectively, the ability to innovate and diversify, and to find important solutions to the problems they face accurately and quickly, given the importance of these two elements for the success of any medical diagnosis, whether it is manual or digital.
8. Creating an art of dialogue and constructive competition between students with each other, which will have a significant and distinguished reflection on professional work by promoting the spirit of teamwork and constructive professionalism.

4. Student Learning Outcomes

1- Intelligent medical systems aim to improve the quality of interventional health care in a way that depends on data collection, analysis, understanding and then employing smart systems that support specialists in this field, which will contribute to reducing medical errors resulting from the hard daily work of doctors and relying on self-assessment, which is not devoid of these errors.

2- The Department of Intelligent Medical Systems works to ensure that the academic program's outputs are based on principles and knowledge from a variety of research areas including artificial intelligence, medical image processing, data analysis, computer vision, bio-imaging, and medicine.

3- Committed to the ultimate goal of creating benefit for patients and medical staff, we aim to develop a holistic concept that spans three important topics: visualization and interpretation of data and real-time assistance and connectivity through a cycle of continuous learning: new spectral imaging technologies are enabled by machine learning deep learning as safe, reliable, and real-time imaging modalities during surgical interventions.

4- When interpreting perceived data in the context of available knowledge, our department specifically addresses common obstacles to clinical translation such as data scarcity, interpretability, and handling uncertainty.

5- With such cooperation with partners in the health and medical field, we can take advantage of these aforementioned methods to develop diagnostic assistance systems and digital analysis using various algorithms and tools in the field of information technology.

6- Transforming medical systems into a medical application machine available to all to facilitate the process of first diagnosis or self-examination by the patients themselves or by doctors who do not have sufficient experience to help them as a preliminary examination or preliminary diagnosis prepared for consultation by specialized centers.

7- One of the most important pillars that the department cares about is working to achieve high accuracy of digital examinations and analyzes, as well as reliable verification of the results of artificial intelligence algorithms and other tools that have been added to design and model various medical systems, applications and sites necessary to perform predictions, classifications of diseases and clinical diagnoses.

5. Credits, Grading and GPA

Credits

(Name) 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)

1. 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:

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

6. Curriculum/Modules

Semester 1: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSW L	SWL hrs/sem	ECTS	Module Type	Pre-request
UOMU03211	Biology	64	86	150	6.00	C	/
UOMU03212	Computer Programming I	64	86	150	6.00	B	/
UOMU03213	Computer Fundamentals	34	41	100	3.00	B	/
UOMU03214	Mathematics	94	81	150	7.00	B	/
UOMU03215	Introduction to Medical Informatics	64	61	150	5.00	C	/
ترميز جامعي	Democracy and Human Rights	32	43	50	2.00	S	/

Semester 2: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSW L	SWL hrs/sem	ECTS	Module Type	Pre-request
UOMU03221	Computer Programming II	63	87	150	6.00	B	Computer Programming I
UOMU03222	General Anatomy and Physiology	63	62	125	5.00	C	Biology
UOMU03223	Molecular Biology	63	62	125	5.00	C	Biology
UOMU03224	Logic Design	63	62	125	5.00	B	/
UOMU03225	Medical Devices and Terminology	63	62	125	5.00	C	Introduction to Medical Informatics
ترميز جامعي	English Language I	33	17	50	2.00	S	/
ترميز جامعي	Arabic I	33	17	50	2.00	S	/

Semester 3: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSW L	SWL hrs/sem	ECTS	Module Type	Pre-request
UOMU03231	Object Oriented Programming	63	87	150	6.00	C	Computer Programming II
UOMU03232	Data Structures	63	87	150	5.00	C	Computer Programming II
UOMU03233	Discrete Mathematics	33	42	75	5.00	B	Mathematics
UOMU03234	Human Diseases for the Health Professions	63	87	150	5.00	C	Medical Devices and Terminology
UOMU03235	Operating Systems	63	112	175	5.00	B	Computer Fundamentals

ترميز جامعي	Crimes of the baath regime in Iraq	33	17	50	2.00	S	/
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Semester 4: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL hrs/sem	ECTS	Module Type	Pre-request
UOMU03241	Biochemistry	63	87	150	6.00	C	
UOMU03242	Bioinformatics	63	87	150	6.00	C	Biology
UOMU03243	Database Systems	63	87	150	6.00	C	Introduction to Medical Informatics
UOMU03244	Statistics and Probability	63	87	150	6.00	B	/
UOMU03245	Data Science Ethics	33	17	50	2.00	S	Mathematics
ترميز جامعي	English Language II	33	17	50	2.00	S	/
ترميز جامعي	Arabic II	33	17	50	2.00	S	English Language I

Semester 5: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL hrs/sem	ECTS	Module Type	Pre-request
UOMU03251	Artificial Intelligence	63	62	125	5.00	C	Object Oriented Programming
UOMU03252	Image Processing	63	62	125	5.00	C	Mathematics
UOMU03253	Geographical Information Systems	63	62	125	5.00	C	/
UOMU03254	Applications Development	63	62	125	5.00	C	Database Systems
UOMU03255	Software Engineering	63	62	125	5.00	B	/
UOMU03256	Computer Networks	63	62	125	5.00	C	Computer Fundamentals

Semester 6: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL hrs/sem	ECTS	Module Type	Pre- request
UOMU03261	Web Development	63	62	125	5.00	B	Applications Development
UOMU03262	Machine Learning	63	62	125	5.00	C	Artificial Intelligence
UOMU03263	Computer Vision	63	62	125	5.00	C	Image Processing
UOMU03264	Embedded Systems	63	62	125	5.00	C	Operating Systems
UOMU03265	Mobile Applications	63	62	125	5.00	C	Applications Development
UOMU03266	Wireless Sensor Networks	63	62	125	5.00	C	Computer Networks

Semester 7: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL hrs/sem	ECTS	Module Type	Pre- request
UOMU03271	Cloud Computing	63	62	125	5.00	E	Web Development
UOMU03272	Data Mining	63	62	125	5.00	C	Machine Learning
UOMU03273	Electronic Health Records	63	62	125	5.00	C	Database Systems
UOMU03274	Deep Learning	63	62	125	5.00	C	Machine Learning
UOMU03275	Simulation and Modeling in Medical Applications	63	62	125	5.00	E	Computer Networks
UOMU03276	Final Project I	32	93	125	5.00	C	/

Semester 8: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL hrs/sem	ECTS	Module Type	Pre- request
UOMU03281	Big Data Analytics	63	62	125	5.00	E	Cloud Computing
UOMU03282	Information Security	63	62	125	5.00	C	Mathematics
UOMU03283	Health Care Systems Administration	63	62	125	5.00	C	Electronic Health Records
UOMU03284	Human and Computer Interaction	63	62	125	5.00	C	Mobile Applications
UOMU03285	Medical Multimedia	63	62	125	5.00	C	Image Processing
UOMU03286	Final Project II	32	93	125	5.00	C	Final Project I

7. Contact

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