

**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
for
Intelligent Medical
Systems
Department**

University of Information Technology and Communications (UoITC)

جامعة تكنولوجيا المعلومات والاتصالات



College of Medical Informatics

كلية المعلوماتية الطبية الحيوية



Intelligent Medical Systems Department

قسم الانظمة الطبية الذكية



Introduction:

The Biomedical Informatics specialization is the first of its kind in Iraq and one of the modern and globally advanced disciplines. It has seen increasing interest in recent years. This specialization integrates advanced knowledge in evolutionary biology with genetics and biological systems, while leveraging modern technologies in computer science, scripting, and data management. It contributes to understanding and analyzing complex biological phenomena, developing intelligent algorithms, and utilizing statistical techniques to extract information from large datasets, thereby aiding economic development and scientific advancement in society. In light of this progress, the University of Information Technology and Communications established the Faculty of Biomedical Informatics on October 10, 2019. The faculty aims to merge information technology with biomedical sciences to enhance healthcare services in fields such as human medicine, veterinary medicine, and agriculture. The specialization comprises two departments: Intelligent Medical Systems and Bioinformatics. Despite the novelty of the faculty, it strives to achieve academic accreditation standards and graduate students capable of competing in the local and international labor market, focusing on a stimulating work environment and promoting collaboration and knowledge exchange.

The Intelligent Medical Systems department is a recent specialization in Iraqi universities that aims to improve healthcare quality by employing information technology, artificial intelligence techniques, biology, chemistry, physics, mathematics, and statistics to design and implement intelligent medical systems that analyze and interpret medical and biological data. The department accepts graduates from the scientific branch of secondary education or its equivalent and awards a bachelor's degree in Intelligent Medical Systems Sciences after

completing the required academic units over four years, in addition to passing summer training and the final-year project.

Academic Program Description Form

University: University of Information Technology & Communications

College / Institute: College of Medical Informatics

Scientific Department: Intelligent Medical Systems

Academic or Professional Program Name: Bachelor of Science in Intelligent Medical Systems

Final Certificate Name: Bachelor's Degree in Intelligent Medical Systems Sciences

Academic System: Semester-based or unit-based (depending on university guidelines)

Description Preparation Date: 1/10/2025

File Completion Date: 1/12/2025

Signature:



Head of Department Name:

Zainab N. Al-Qudsy

Date: 1/12/2025

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. Program Vision

The Intelligent Medical Systems Department aspires to be a leader both locally and internationally in supporting and developing healthcare systems, promoting scientific research, and meeting the needs of governmental institutions and the labor market with the aim of improving the quality of healthcare services.

2. Program Mission

To prepare distinguished graduates equipped with the skills necessary to keep up with advancements in information technology and apply them in medical and biological fields, enabling them to effectively compete in the labor market both locally and globally.

3. Program Objectives

The Intelligent Medical Systems Department aims to prepare graduates who are capable of:

1. Utilizing and developing intelligent medical technologies and systems, keeping pace with the rapid advancements in digital medical technologies.
2. Designing and implementing medical programs related to healthcare systems.
3. Collecting, discovering, and analyzing medical data to serve scientific research and achieve comprehensive healthcare.
4. Enhancing collaboration with relevant sectors inside and outside Iraq.

5. Developing students' personalities by instilling ethical and humanitarian values, providing leadership and problem-solving skills, and committing to quality and professional conduct.

4. Program Accreditation

The accreditation of an **Intelligent Medical Systems** department typically involves ensuring that its academic programs meet established standards in medical informatics, bioinformatics, and artificial intelligence applications in healthcare. Based on available information, here are some key aspects of accreditation for such programs:

- **Quality Assurance & Standards:** Departments often align their curriculum with international accreditation bodies to ensure high-quality education in medical technology and AI-driven healthcare solutions.
- **Interdisciplinary Integration:** Programs emphasize the fusion of **computer science, bioinformatics, and artificial intelligence** to develop intelligent medical systems that enhance diagnostics and patient care.
- **Research & Innovation:** Accredited departments focus on **scientific research, digital medicine, and smart health applications**, contributing to advancements in healthcare technologies.
- **Collaboration with Healthcare Institutions:** Many programs establish partnerships with hospitals, research centers, and medical software companies to ensure practical applications of intelligent medical systems.
- **Graduate Competency:** Accreditation ensures that graduates possess expertise in **medical data analysis, AI-driven diagnostics, and healthcare system optimization**, preparing them for roles in hospitals, research institutions, and medical technology firms.

5. Other external influences

External influences on **Intelligent Medical Systems** can shape research, development, and implementation in significant ways. Here are five major external factors:

1. **Technological Advancements**
 - AI innovations, machine learning models, and big data analytics continuously enhance intelligent medical systems.
 - Cloud computing and cybersecurity measures impact the security and scalability of medical data processing.

2. Regulatory & Ethical Considerations

- Government regulations, such as patient data protection laws (GDPR, HIPAA), influence the development of AI-based healthcare applications.
- Ethical concerns about AI bias and decision-making in medical diagnoses affect acceptance and usage.

3. Healthcare Industry Needs & Challenges

- Increasing demand for personalized medicine drives advancements in AI-assisted treatment plans.
- Hospital budgets and infrastructure influence the integration of intelligent medical systems.

4. Interdisciplinary Collaboration

- Partnerships between biologists, data scientists, statisticians, and medical practitioners shape research directions.
- Research funding from universities, private sectors, and government agencies impacts progress.

5. Public & Patient Perception

- Trust in AI-driven diagnostics and treatments affects adoption rates.
- Awareness and education on intelligent medical technologies influence how practitioners and patients use them.

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Total requirements	59	207	100%	
Institution Requirements	8	14	14%	
College Requirements	15	53	25%	
Department Requirements	36	148	61%	
Summer Training	–	–	–	
Other				

7. Program Description

Note: Only Levels I and II currently follow the Bologna Process. Levels III and IV are still aligned with the traditional semester system and have not yet transitioned to the Bologna framework. As a

result, the third and fourth levels will be suspended during the 2025–2026 academic year. For further details, please refer to the program description under the semester system.

Year/Level/semester	Course Code	Course Name	Units	P	T
2026-2025/ first/1	IMS111	Logic Design I	3	2	2
2026-2025/ first/1	BMI111	Mathematics I	3	2	2
2026-2025/ first/1	IMS112	Introduction to Medical Informatics	3	2	2
2026-2025/ first/1	BMI117	Biology	4	2	3
2026-2025/ first/1	BMI113	Computer programming I	3	2	2
2026-2025/ first/1	BMI115	Computer fundamentals	2	-	2
2026-2025/ first/1	HUR111	Human Rights	1	-	1
2026-2025/ first/2	IMS122	Logic Design II	3	2	2
2026-2025/ first/2	BMI122	Mathematics II	3	2	2
2026-2025/ first/2	IMS122	Bioinformatics	3	2	2
2026-2025/ first/2	IMS123	Medical Terminology	2	-	2
2026-2025/ first/2	BMI124	Computer Programming II	3	2	2
2026-2025/ first/2	DAF121	Democracy and Freedom	1	-	1
2026-2025/ first/2	ENG121	English I	2	-	2
2026-2025/ first/2	ARB121	Arabic	2	-	2
2026-2025/ second/1	IMS215	General Anatomy and Physiology	3	2	2
2026-2025/ second/1	IMS212	Biochemistry	3	2	2
2026-2025/ second/1	BMI122	Discrete Mathematics	2	-	2
2026-2025/ second/1	BMI211	Data structures	3	2	2
2026-2025/ second/1	IMS211	Object Oriented Programming I	3	2	2
2026-2025/ second/1	IMS213	Computer Networking	3	2	2
2026-2025/ second/1	IMS214	Microprocessors	3	2	2
2026-2025/ second/1	ETH211	Ethics	2	-	2
2026-2025/ second/2	IMS226	Human Disease for the Health Professions	3	2	2
2026-2025/ second/2	IMS225	Molecular biology	3	2	2

2026-2025/ second/2	BMI221	Statistics & Probability	3	2	2
2026-2025/ second/2	IMS224	Data Acquisition for Medical Applications	3	2	2
2026-2025/ second/2	IMS222	Object Oriented Programming II	3	2	2
2026-2025/ second/2	IMS221	Database Systems in Healthcare	3	2	2
2026-2025/ second/2	IMS223	Operating Systems	2	-	2
2026-2025/ second/2	ENG222	English II	2	-	2
2026- 2025/Third/1	IMS312	Embedded systems	3	2	2
2026- 2025/Third/1	BMI311	Artificial Intelligence I	3	2	2
2026- 2025/Third/1	IMS311	Applications Development I	3	2	2
2026- 2025/Third/1	IMS313	Web Programming I	3	2	2
2026- 2025/Third/1	IMS314	Digital Signal Processing	3	2	2
2026- 2025/Third/1	IMS315	Geographical Information Systems (GIS) for Health Care	3	2	2
2026- 2025/Third/1	IMS316	Software Engineering	3	2	2
2026- 2025/Third/2	IMS321	Wireless body sensor networks	3	2	2
2026- 2025/Third/2	BMI322	Artificial Intelligence II	3	2	2
2026- 2025/Third/2	IMS322	Applications Development II	3	2	2
2026- 2025/Third/2	IMS324	Web Programming II	3	2	2
2026- 2025/Third/2	BMI321	Medical Image Processing	3	2	2
2026- 2025/Third/2	IMS325	Computer Network Protocols	3	2	2
2026- 2025/Third/2	ENG323	English III	2	-	2
2026- 2025/Fourth/1	BMI411	Cloud Computing	3	2	2
2026- 2025/Fourth/1	IMS412	Deep learning	3	2	2

2026-2025/Fourth/1	IMS413	Health Care Systems Administration I	2	-	2
2026-2025/Fourth/1	IMS414	Clinical Data Mining	3	2	2
2026-2025/Fourth/1	IMS415	Simulation and Modeling in Medicine Applications	3	2	2
2026-2025/Fourth/1	IMS416	Big Data Analysis in Health Care	3	2	2
2026-2025/Fourth/1	BMI410	Final Project I	3	2	2
2026-2025/Fourth/2	IMS421	Electronic Health Records	2	2	3
2026-2025/Fourth/2	IMS422	Human Computer Interaction in Health Care	-	2	2
2026-2025/Fourth/2	IMS425	Information Security in Healthcare	2	2	3
2026-2025/Fourth/2	IMS424	Health Care Systems Administration II	2	2	3
2026-2025/Fourth/2	IMS426	Medical Multimedia	2	2	3
2025-2024/Fourth/2	ENE424	English IV	-	2	2
2026-2025/Fourth/2	BMI420	Final Project II	2	2	2
Total			153	94	121

1. Expected learning outcomes of the program

Knowledge	
Learning Outcomes A1	Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
Learning Outcomes A2	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
Learning Outcomes A3	Students will gain foundational knowledge of artificial intelligence techniques used in medical diagnostics, treatment planning, and patient monitoring.
Learning Outcomes A 4	Developing and managing digital medical systems for administration, diagnosis, classification, and predictive analytics to optimize healthcare workflows, enhance decision-making, and improve patient outcomes.

Skills	
Learning Outcomes B1	Design, implement, and evaluate a computing-based solution to a given set of computing requirements in the context of the program's discipline.
Learning Outcomes B2	Communicate effectively in a variety of professional contexts.
Learning Outcomes B3	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
Learning Outcomes B4	Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals.
Ethics	
Learning Outcomes C1	Students will understand the ethical implications of AI-driven medical systems, ensuring responsible development and application in patient care.
Learning Outcomes C2	students will learn to uphold ethical standards in handling medical data, ensuring compliance with privacy regulations and protecting patient information.

2. Teaching and Learning Strategies

The **Intelligent Medical Systems Department** incorporates diverse **teaching and learning methods** to ensure a well-rounded educational experience that aligns with technological advancements and student needs.

Teaching and Learning Methods

1. **Direct Learning:** Traditional instructor-led classroom sessions, including lectures, discussions, and hands-on practical work.
2. **Self-Learning:** Encouraging students to take initiative in independent study, research, and project development to enhance critical thinking and problem-solving abilities.
3. **E-Learning:** Utilizing digital platforms, online courses, and AI-driven educational tools to provide flexibility and accessibility in learning.

These methods are applied throughout the program to ensure students gain both theoretical knowledge and practical expertise in intelligent medical systems.

3. Evaluation methods

Throughout all stages of the **Intelligent Medical Systems Department** program, various assessment methods are implemented to evaluate student performance and competency. These methods ensure a comprehensive review of knowledge, skills, and intellectual abilities.

Assessment Methods

1. **Achievement Tests:** Measure students' mastery of course objectives, ensuring they have acquired essential knowledge and skills.
2. **Standard Tests:** Evaluate performance based on predetermined benchmarks and industry standards to maintain academic excellence.
3. **Individual Skills Assessment:** Assess specific technical and practical competencies related to intelligent medical systems, ensuring students meet professional requirements.
4. **Selection of Intellectual Questions in Achievement Tests:** Incorporate high-level cognitive challenges to encourage critical thinking, innovation, and problem-solving skills.

These assessment strategies ensure students are continuously monitored, guided, and developed throughout the program.

1. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements /Skills (if applicable)		Number of the teaching staff	
	General	Special	Highest Degree		Staff/ Lecturer	Academic Title
Zainab N. Al-qudsy	Computer Science	Data Security	Ph.D.		Staff	Lecturer
Ahmed Wadi Shihab Musa Al-Salhi	Mathematics	Differential Equations	Ph.D.		Staff	Lecturer
Enas Adnan Mohammad Hussein Al-Husseini	Computer Science	Information Management in Project Administration	M.Sc		Staff	Assistant Lecturer

Hiba Mohammad Wajeeh Majid Al-Shamma	Computer Science	Computing Science	M.Sc		Staff	Assistant Lecturer
Muneera Abdul Hamdi Khalaf Al-Saadi	Computer Science	Artificial Intelligence and Pattern Recognition	Ph.D.		Staff	Lecturer
Saif Qasim Mohammad Hassan	Computer Science	Information Technology	Ph.D.		Staff	Assistant Professor
Dalia Samer Ismail Alwan Al-Dulaimi	Computer Science	Information Technology	M.Sc		Staff	Lecturer
Moatasem Amer Mohammad Kazem Al-Eithawi	Physics	General Physics	M.Sc		Staff	Assistant Lecturer
Mustafa Walid Zgair Kazem	Accounting	Cost and Managerial Accounting	Ph.D.		Staff	Lecturer
Dunya Hamid Hamid Alawi	Computer Science	Computer Networks and Data Mining	Ph.D.		Staff	Lecturer
Mazin Hussein Abdullah Darwish	Civil Engineering	Structural Engineering	Ph.D.		Staff	Lecturer
Safana Zaid Ahmed	Bioinformatics	Bioinformatics	M.Sc		Staff	Assistant Lecturer
Fatima Qasim Abdulmajid	Physics	Medical Physics	M.Sc		Staff	Assistant Lecturer
Zaid Ali Saeed	Computer Communications	Computer Communications	M.Sc		Staff	Assistant Lecturer
Atyaf Sami Nouri	Computer Engineering	Information Technology	Ph.D.		Staff	Lecturer
Ahmed Majid Taha	Computer Science	Artificial Intelligence	Ph.D.		Staff	Lecturer
Hiba Adel Mahdi	Arabic Language – Education	Abbasid Literature	Ph.D.		Staff	Assistant Professor

Ali Hikmat Abbas	Chemistry	Organic Chemistry	M.Sc		Staff	Assistant Lecturer
Aseel Aboud Jawad	Mathematics	Mathematics	M.Sc		Staff	Assistant Lecturer
Sara Hussein Kureidi	Chemistry	Inorganic Chemistry	M.Sc		Staff	Assistant Lecturer
Zainab Mustafa Rida	Computer Science	Cybersecurity	M.Sc		Staff	Assistant Lecturer
Saja Ali Ahmed Munt Ali	Life Sciences	Biotechnology Techniques	M.Sc		Staff	Assistant Lecturer
Shirin Nizar Qasim Mohammad	Genetic Engineering and Biotechnology	Genetic Engineering and Biotechnology	M.Sc		Staff	Assistant Lecturer
Doaa Jafar Saleh Mahdi	Media Studies	Media Studies	M.Sc		Staff	Assistant Lecturer
Ansam Ali Abdulameer	Computer Science	Computer Systems	M.Sc		Staff	Assistant Lecturer
Ruaa Safi Abdullah	Computer Engineering	Data Science and Artificial Intelligence	M.Sc		Staff	Assistant Lecturer
Ghaith Jafar Saleh	Computer Engineering	Computer Engineering	Ph.D.		Staff	Lecturer
Sarah Maan Abdullah	Banking and Finance	Banking and Finance	M.Sc		Staff	Assistant Lecturer
Waleed Khalid Hussein Ali	Computer Science	Computer Networks	Ph.D.		Staff	Lecturer
Mohammad Qasim Jawad	Computer Science	Computer Science	M.Sc		Staff	Assistant

					Lecturer
Noor Sabah Abbas Mutlak	Computer Engineering	Computer Engineering	M.Sc	Staff	Assistant Lecturer
Haneen Farouq Abdulhamid	Biotechnology	Biotechnology	M.Sc	Staff	Assistant Lecturer
Rana Abdulhamid Hadi	Applied Mathematics	Mathematical Statistics	M.Sc	Staff	Assistant Lecturer
Mai Tariq Abdulhadi	Control & Systems Engineering	Mechatronics Engineering	M.Sc	Staff	Assistant Lecturer
Rujwan Hamoud Shayya	Mathematical Sciences	Applied Mathematics	M.Sc	Staff	Assistant Lecturer
Iman Dawood Salman al_jubouri	Computer Engineering and Software	Artificial Intelligence	M.Sc	Staff	Assistant Lecturer
Hayder Talib Jawad ALsammak	Computer Engineering	Artificial Intelligence and Robotics	M.Sc	Staff	Assistant Lecturer

Professional Development

Mentoring new faculty members

New faculty members are guided through a structured mentoring process to support their professional growth and integration into the academic environment. a brief overview of how it is implemented:

- **Orientation & Initial Training:** Faculty members receive an introduction to institutional policies, teaching methodologies, and research expectations.
- **Regular Meetings & Feedback:** Scheduled meetings allow faculty to discuss challenges, receive constructive feedback, and refine their teaching or research approaches.
- **Workshops & Training Programs:** Professional development programs offer training in pedagogy, research methodologies, and leadership skills.

- **Peer Collaboration & Networking:** Opportunities are provided for interdisciplinary discussions, project collaborations, and expanding professional networks.

Evaluation & Continuous Improvement: The mentorship process is periodically reviewed to ensure effectiveness, with adjustments made based on feedback from both mentors and mentees.

Professional development of faculty members

Faculty development plans are designed to enhance teaching effectiveness, research capabilities, and professional growth. a brief overview of key components:

- **Teaching & Learning Strategies:** Faculty engage in active learning techniques, curriculum innovation, and technology integration to improve student outcomes.
- **Assessment of Learning Outcomes:** Regular evaluations, student feedback, and peer reviews help refine teaching methods and ensure academic excellence.
- **Professional Development:** Workshops, conferences, and mentorship programs support faculty in advancing their expertise and staying updated with industry trends.
- **Research & Scholarly Activities:** Faculty are encouraged to participate in research projects, publish papers, and collaborate with academic institutions.
- **Leadership & Career Growth:** Opportunities for leadership roles, administrative training, and career progression are provided to foster professional advancement.

8. Acceptance Criterion

Enrollment regulations follow the guidelines set by the **Ministry of Higher Education and Scientific Research in Iraq** and generally include the following key policies:

- **Central Admission System:** The college follows a centralized admission system where students apply through a national system that allocates seats based on high school grades.
- **Application Process:** Includes deadlines, required documents (certificates, personal records), and application fees for students accepted under private funding.
- **Enrollment Limits & Quotas:** There are reserved seats within the central admission channel based on factors such as nationality, socioeconomic background, and specific categories such as families of martyrs and low-income individuals.
- **Transfer & Re-enrollment Policies:** Guidelines for students transferring from other institutions or returning after a break in studies.
- **Scholarships & Financial Aid:** Regulations governing eligibility for financial assistance, scholarships, and tuition exemptions.

9. The most important sources of information about the program

- **Official University Websites:** Institutions provide detailed program descriptions, admission requirements, and course structures.
- **Academic Journals & Research Papers:** Scholarly articles offer insights into curriculum effectiveness and advancements in the field.
- **Faculty & Student Testimonials:** First-hand experiences from professors and students provide valuable perspectives on program quality.
- **Educational Databases:** Platforms like [Google Scholar](#) and research repositories contain academic studies related to various programs.
- **Institutional Reports & Brochures:** Universities release annual reports, brochures, and prospectuses outlining program details.
- **Digital Content Platform:** The [Digital Content website](#) provides valuable resources related to academic programs.
- **Intelligent Medical Systems Department Website:** The official [Intelligent Medical Systems Department page](#) offers insights into the program, curriculum, and research initiatives.

10. Program Development Plan

The **Program Development Plan** for the **Intelligent Medical Systems Department** outlines the strategic approach to curriculum design, faculty development, research initiatives, and industry collaboration. Here's a brief overview:

- **Curriculum Enhancement:** Continuous updates to integrate advancements in artificial intelligence, medical informatics, and healthcare technologies.
- **Faculty Training & Development:** Ongoing professional development programs, workshops, and research opportunities to enhance expertise.
- **Student Learning Outcomes:** Defined objectives to ensure graduates acquire technical, analytical, and problem-solving skills relevant to intelligent medical systems.
- **Research & Innovation:** Encouraging interdisciplinary research in AI-driven healthcare solutions, medical data analytics, and smart health applications.
- **Industry Partnerships:** Collaboration with healthcare institutions, technology companies, and research centers to provide hands-on experience and career opportunities.
- **Infrastructure & Resources:** Investment in laboratories, AI-driven medical tools, and digital learning platforms to support academic excellence.

For more details, you can explore the [Intelligent Medical Systems Department program catalog](#) or the [department's official page](#).

11. Program Skills Outline

Note: Level I and II follow the Bologna Process, while level III and IV follow the semester system before adopting the Bologna process system

□ **Program Skills Outline – First Level / First Semester**

This format reflects the legacy learning outcome model used from 2019 to 2022–2023. It has since been suspended due to the adoption of the Bologna Process.

Course Code	Course Name	Course Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
IMS111	Logic Design I	Core (C)		✓		✓		✓		✓		
BMI111	Mathematics I	Basic (B)	✓	✓	✓		✓		✓		✓	✓
IMS112	Introduction to Medical Informatics	Basic (B)	✓	✓			✓		✓	✓		✓
BMI117	Biology	Basic (B)	✓				✓	✓	✓			
BMI113	Computer Programming I	Core (C)		✓		✓	✓	✓			✓	
BMI115	Computer Fundamentals	Supportive (S)					✓		✓	✓		✓
HUR111	Human Rights	Supportive (S)									✓	✓

□ **Program Skills Outline – First Level / Second Semester**

Note: This course structure reflects the legacy outcome model in use from 2019 to 2022–2023. It has been suspended with the adoption of the Bologna Process.

Course Code	Course Name	Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
IMS122	Logic Design II	Basic (B)	✓			✓					✓	
BMI122	Mathematics II	Basic (B)	✓	✓	✓		✓		✓		✓	✓
IMS124	Bioinformatics	Core (C)		✓		✓		✓			✓	
IMS123	Medical Terminology	Core (C)		✓	✓	✓		✓	✓		✓	✓
BMI124	Computer Programming II	Basic (B)	✓		✓		✓		✓			
DAF121	Democracy and Freedom	Supportive (S)		✓		✓					✓	
ENG121	English I	Supportive (S)		✓		✓					✓	
ARB121	Arabic	Supportive (S)					✓	✓				

□ **Program Skills Outline – Second Level / First Semester (2025–2026)**

Course Code	Course Name	Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
IMS215	General Anatomy and Physiology	Core (C)	√	√		√	√	√		√	√	
IMS212	Biochemistry	Core (C)	√	√	√	√	√	√	√			
BMI122	Discrete Mathematics	Basic (B)	√		√				√			
BMI211	Data Structures	Core (C)	√	√	√	√	√	√	√			
IMS211	Object Oriented Programming I	Core (C)	√	√		√	√	√		√	√	√
IMS213	Computer Networking	Core (C)	√	√			√	√	√	√		√
IMS214	Microprocessors	Core (C)	√	√			√	√	√	√		√
ETH211	Ethics	Basic (B)		√		√		√	√	√	√	

□ **Program Skills Outline – Second Level / Second Semester**

Course Code	Course Name	Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
IMS226	Human Disease for the Health Professions	Core (C)		√			√		√			√
IMS225	Molecular Biology	Core (C)		√			√		√			√
BMI221	Statistics & Probability	Basic (B)	√	√	√	√	√	√	√	√	√	√
IMS224	Data Acquisition for Medical Applications	Basic (B)	√		√	√	√	√		√	√	√
IMS222	Object-Oriented Programming II	Supportive (S)		√		√		√	√	√	√	
IMS221	Database Systems in Healthcare	Supportive (S)			√		√				√	
IMS223	Operating Systems	Supportive (S)					√	√				
ENG222	English II	Supportive (S)		√		√					√	

□ Program Skills Outline – Third Level / First Semester (2025–2026)

Course Code	Course Name	Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
IMS312	Embedded Systems	Core (C)	√	√	√	√	√	√	√	√	√	
BMI311	Artificial Intelligence I	Core (C)	√	√	√	√	√	√	√	√	√	√
IMS311	Applications Development I	Core (C)	√	√		√	√	√	√	√		√
IMS313	Web Programming I	Core (C)	√	√	√	√	√	√	√	√	√	√
IMS314	Digital Signal Processing	Basic (B)		√	√		√		√			√
IMS315	Geographical Information Systems (GIS) for Health Care	Core (C)	√	√			√	√	√	√		√
IMS316	Software Engineering	Core (C)	<i>Pending mapping</i>	√	√	√	√	√	√	√	√	√

□ Program Skills Outline – Third Level / Second Semester (2025–2026)

Course Code	Course Name	Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
IMS321	Wireless Body Sensor Networks	Basic (B)	√		√	√	√		√	√	√	√
BMI322	Artificial Intelligence II	Core (C)	√		√	√	√		√		√	√
IMS322	Applications Development II	Core (C)	√	√	√	√	√		√	√	√	√
IMS324	Web Programming II	Core (C)	√		√	√	√		√	√	√	√
BMI321	Medical Image Processing	Core (C)				√	√		√	√		
IMS325	Computer Network Protocols	Core (C)	√	√	√	√	√	√	√	√	√	√
ENG323	English III	Supportive (S)										

□ Program Skills Outline – Fourth Level / First Semester (2025–2026)

Course Code	Course Name	Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
BMI411	Cloud Computing	Elective (E)	√					√	√			
IMS412	Deep Learning	Core (C)	√		√	√	√				√	√

Course Code	Course Name	Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
IMS413	Health Care Systems Administration I	Core (C)	√	√	√	√	√	√	√	√	√	√
IMS414	Clinical Data Mining	Core (C)	√		√	√	√		√		√	√
IMS415	Simulation and Modeling in Medicine Applications	Elective (E)			√	√						
IMS416	Big Data Analysis in Health Care	Core (C)	√	√	√	√		√	√	√	√	√
BMI410	Final Project I	Capstone (C)	√	√	√	√		√	√	√	√	√

Program Skills Outline – Fourth Level / Second Semester (2025–2026)

Course Code	Course Name	Type	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
IMS421	Electronic Health Records	Elective (E)	√	√	√	√	√	√	√	√	√	√
IMS422	Human Computer Interaction in Health Care	Core (C)	√	√	√	√		√	√	√	√	√
IMS425	Information Security in Healthcare	Core (C)	√	√		√	√	√	√	√	√	√
IMS424	Health Care Systems Administration II	Core (C)		√	√	√			√			
IMS426	Medical Multimedia	Core (C)			√		√	√			√	
ENE424	English IV	Core (C)			√			√				√
BMI420	Final Project II	Capstone	√	√	√	√		√	√	√	√	√

Intelligent Medical Systems (IMS) Department

Academic Year: 2025–2026

Level 3 – Semester 1

No.	Subject Code	Subject Name	Type	Theory Hours	Title(s)	Instructor Name	Practical Hours	Units
1	IMS312	Computer Network Protocols	Compulsory	2	Lecturer Dr.	Waleed Khalid Hussein	2	3
2	BMI311	Artificial Intelligence I	Compulsory	2	Lecturer Dr.	Ahlam Rasheed	2	3
3	IMS311	Applications Development I	Compulsory	2	Assistant Lecturer	Heba Wajih	2	3
4	IMS313	Web Programming I	Basic	2	Assistant Lecturer	Ban Isam Rashid	2	3
5	IMS314	Digital Signal Processing	Compulsory	2	Lecturer	Nada Subeih	2	3
6	IMS315	GIS for Health Care	Compulsory	2	Assistant Lecturer	Mutasim Ameer	2	3
7	IMS316	Software Engineering	Basic	2	Lecturer Dr.	Ahmed Majid	2	3

□ **Intelligent Medical Systems (IMS) Department**

Academic Year: 2025–2026

Level 3 – Semester 2

No.	Subject Code	Subject Name	Type	Theory Hours	Title(s)	Instructor Name	Practical Hours	Units
1	IMS321	Wireless Body Sensor Networks	Compulsory	2	Lecturer Dr.	Waleed Khalid Hussein	2	3
2	BMI322	Artificial Intelligence II	Compulsory	2	Lecturer Dr.	Ahlam Rasheed	2	3
3	IMS322	Applications Development II	Compulsory	2	Assistant Lecturer	Heba Wajih	2	3
4	IMS324	Web Programming II	Basic	2	Associate Professor Dr.	Imad Qasim Habeeb	2	3
5	BMI321	Medical Image Processing	Compulsory	2	Assistant Lecturer	Roa Safi	2	3

No.	Subject Code	Subject Name	Type	Theory Hours	Title(s)	Instructor Name	Practical Hours	Units
6	IMS325	Computer fundamentals	Compulsory	2	Assistant Lecturer	Zaid Ali Saeed	2	3
7	ENG323	English III	Supporting	2	Assistant Lecturer	Mohammed Fareed	–	2

Intelligent Medical Systems (IMS) Department

Academic Year: 2025–2026

Level 4 – Semester 1

No.	Subject Code	Subject Name	Type	Theory Hours	Title(s)	Instructor Name	Practical Hours	Units
1	BMI411	Cloud Computing	Elective	2	Assistant Lecturer	Gaith Jaafer	2	3
2	IMS412	Deep Learning	Compulsory	2	Lecturer Dr.	Muneera Abdul Hamdi	2	3
3	IMS413	Health Care Systems Administration I	Compulsory	2	Lecturer Dr.	Zainab Noaman	–	2
4	IMS414	Clinical Data Mining	Compulsory	2	Assistant Lecturer	Zainab Mustafa	2	3
5	IMS415	Simulation and Modeling in Medicine Applications	Elective	2	Assistant Lecturer	Noor Sabah	2	3
6	IMS416	Big Data Analysis in Health Care	Elective	2	Lecturer Dr.	Atyaf Sami	–	2
7	BMI410	Final Project I	Compulsory	2	–	–	2	3

Intelligent Medical Systems (IMS) Department

Academic Year: 2025–2026

Level 4 – Semester 2

No.	Subject Code	Subject Name	Type	Theory Hours	Title(s)	Instructor Name	Practical Hours	Units
1	IMS421	Electronic Health Records	Compulsory	2	Lecturer Dr.	Zainab Noaman	2	3

No.	Subject Code	Subject Name	Type	Theory Hours	Title(s)	Instructor Name	Practical Hours	Units
2	IMS422	Human-Computer Interaction in Health Care	Compulsory	2	Lecturer Dr.	Atyaf Sami	2	3
3	IMS425	Information Security in Healthcare	Compulsory	2	Assistant Lecturer	Zaid Ali Saeed	2	3
4	IMS424	Health Care Systems Administration II	Compulsory	2	Lecturer Dr.	Ahmed Majid	2	3
5	IMS426	Medical Multimedia	Compulsory	2	Lecturer Dr.	Ghaith Jaafar	2	3
6	ENE424	English IV	Supportive	2	Assistant Lecturer	Mohammed Fareed	–	2
7	BMI420	Final Project II	Compulsory	2	–	–	2	3

Course Description Form

Course Name: Deep Learning	
1. Course Code: IMS412	
2. Semester 7 / Year 2025-2026	
3. Description Preparation Date: 16-09-2025	
4. Available Attendance Forms: Yes	
5. Number of Credit five (Total) / 5 Hours (125)	
6. Cours administrators name(mention all, if more than one name)	
Name: Dr. Muneera Abed Hmdi Email: dr.muneera.alsaedi@uoitc.edu.iq	
7. Course Objectives	
Course Objectives <ul style="list-style-type: none"> • Understanding Core Concepts. • Build and Train Neural Network Models. • Apply Deep Learning Architecture 	<ul style="list-style-type: none"> • Perform Data Preparation and Model Evaluation. • Optimize and Tune Models. • Deploy Deep Learning Models. • Apply Deep Learning in Real-World Domains.
8. Teaching and Learning Strategies	
Strategy	<ol style="list-style-type: none"> 1. Interactive Lectures. <ul style="list-style-type: none"> - Explain core theories (neural networks, backpropagation, CNNs, RNNs, transformers) using intuitive visualizations. - Use real-life case studies from healthcare and image recognition, NLP. 2. Hands-On Coding Sessions.

- Provide guided coding labs using **Python, TensorFlow, PyTorch.**
 - Students implement models step-by-step rather than only learning theory.
 - Encourage collaborative coding and peer review.
3. Jupyter Notebook Demonstrations.
 - Use notebooks with executable code blocks to visually show model training, loss curves, gradients, and predictions.
 - Provide template notebooks that students can modify.
 4. Problem-Based Learning (PBL).
 - Present practical problems (e.g., classifying medical images, predicting sequences).
 - Students design and train deep learning models to solve them.
 5. Dataset Exploration Workshops.
 - Let students explore datasets (Kaggle, UCI, biomedical datasets).
 - Teach data cleaning, augmentation, and feature engineering through guided labs.
 6. Discussion and Reflection.
 - Allow students to discuss challenges faced during model training.

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to Deep Learning.	Covers foundations of deep learning theory and practice.	Direct learning	Students Performance Assessment.
2	2	Back-propagation algorithm, Multi-layer	Students will know the backpropagation a	Direct learning	Students Performance Assessment.

3	2	Perceptron. Training Neural Networks.	perceptron algorithms and how they work. Students will know the process of teaching a neural network to perform a task.	Direct learning	Quiz
4	2	Using Keras.	Students can use Keras to solve machine learning problems because it covers every.	Direct learning	Students Performance Assessment.
5	2	Deep Learning on Images.	Students will study how can uses neural networks to learn useful representations of features directly from images.	Direct learning	Students Performance Assessment.
6	2	CNN Architecture: Part 1	Students will understand what CNN architecture is. What are the benefits of CNN? Why do we use it?	Direct learning	Students Performance Assessment.
7	2	CNN Architecture: Part 2	Students will study what are the main applications of CNN	Direct learning	Students Performance Assessment.
8	2	Special Type of RNNs.	Students will study the types of RNN?	Direct learning	Students Performance Assessment.

9	2	Mid exam 1.	Students will perform the first monthly exam of an academic term.	Direct learning	Students Performance Assessment
10	2	Unsupervised Approaches of Deep Learning	Students will know how to use genetic to solve problems using the Python language.	Direct learning E-learning.	Quiz
11	2	Object detection in deep learning: Part	Students will learn how these agents can manipulate knowledge to infer new things.	Direct learning E-learning	Students Performance Assessment Achievement Tests.
12	2	Mid exam 2	Students will perform the second monthly exam of an academic term.	Direct learning	Students Performance Assessment
13	2	Object detection in deep learning: Part	Let students know how can use Model Inference and Entailment	Direct learning	Students Performance Assessment Achievement Tests.
14	2	Generative AI Generative Adversarial Networks (GANs)	This topic introduces generative models and their types, covering foundational techniques such as Variational Autoencoders (VAE) and Generative Adversarial Networks (GANs),	Direct learning	Students Performance Assessment Achievement Tests

			while also exploring applications in text-to-image generation, healthcare, art, and music, with a focus on ethical considerations and societal impacts		
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10. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral or monthly written exams, reports, seminars, projects, etc.

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Deep Learning in Computer Vision by: Xiaogang Wang
Main references (sources)	Introduction to Deep Learning in Python. DataComp Link
Recommended books and references (scientific journals, reports...)	Computer Vision Using Deep Learning Vaibhav Verdhan
Electronic References, Websites	Deep Learning specialization on Coursera website Andrew Ng Convolution Neural Network on Coursera website Andrew Ng

Courses Description Forms

Course Name: Health Care Systems Administration I	
1. Course Code: IMS413	
2. Semester / Year: 4 Semester 7/2025-2026	
3. Description Preparation Date: 10/9/2025	
4. Available Attendance Forms: Theoretical/ Class Attendance Register	
5. Number of Credit Hours (Total) / Number of Units (Total)	
15/2	
6. Course administrator's name (mention all, if more than one name)	
Name: Zainab N. Al-qudsy Email: dr.zainab.n.yousif@uoitc.edu.iq	
7. Course Objectives	
Course Objectives	<p>The course objective is to understand healthcare systems, ethical and legal healthcare issues, management functions, leadership styles, and healthcare marketing concepts. Upon completion of the module, you will be able to:</p> <ul style="list-style-type: none"> • Describe the concepts and theories of healthcare management system • Demonstrate new skills through the use of materials, tools, and/or technology that are central to healthcare management. • Interpret and explain significant laws and ethics of healthcare management and delivery. • Students explore health care systems in both developed and developing countries
8. Teaching and Learning Strategies	
Strategy	<ul style="list-style-type: none"> - Blended-Learning - Self-Learning - Learning by Experimentation

- Brainstorming

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 st	2	P1, A1	Overview of Healthcare Systems Administration	Achievement Tests Presentation Project Individual Skills	Self-learning
2 nd	2	P2, B3	Health Care System: Structure, Key Divisions, Insurance Plans and Key Industries	Achievement Tests Presentation Project Individual Skills	Self-learning
3 rd	2	P1, P2, A1	Comprehensive Overview of Health Care Delivery and Reform	Achievement Tests Presentation Project Individual Skills	Self-learning
4 th	2	P4, P6, A4	Healthcare Safety Net, Quality, Efficiency, and Global Data Insights	Achievement Tests Presentation Project Individual Skills	Self-learning
5 th	2	P5, P6, A3	Key Legal and Regulatory Aspects of Healthcare Compliance and Protection	Achievement Tests Presentation Project Individual Skills	Self-learning
6 th	2	P3, P10, A2, C2	Key Ethical Considerations in Medical Practice and Decision Making	Achievement Tests Presentation Project Individual Skills	Self-learning
7 th	2	P8, C1	Overview and Challenges of the National Iraqi Healthcare System	Achievement Tests Presentation Project Individual Skills	Self-learning
8 th	2	P4, A4	Standard Tests I	Standard Tests I	Self-learning
9 th	2	Course-Level Outcomes P1, P2, P4, P5, P3, P10, P8, P6 Program-Learning Outcomes: A1, A2, A3, A4, B3, C1, C2	Healthcare Policy, Regulation, Financing, and Reimbursement	Achievement Tests Presentation Project Individual Skills	Self-learning
10 th	2	P6, P7, A1, B1	Leadership and Management in Population Health	Achievement Tests Presentation Project Individual Skills	Self-learning

11th	2	P2, P6, B3	Enhancing Healthcare through Marketing, Communications, and Quality Improvement	Achievement Tests Self presentation Project Individual Skills	Self learning
12th	2	P5, P11, B2	Standard Tests	Standard Tests	Self learning
13th	2	Course- Level Outcomes: P2, P5, P6, P7, P11 Program-Level Outcomes: A1, B1, B2, B3	Advancing Healthcare through Quality Improvement, Supply Chain Management, and Workforce Development	Achievement Tests Self presentation Project Individual Skills	Self learning
14th	2	P7, P9, B1	Innovations in Telehealth, Ethics, Law, and Emergency Preparedness in Healthcare	Achievement Tests Self presentation Project Individual Skills	Self learning
15th	2	P8, A3, C1, C2	Advancing Patient-Centric and Economically Sustainable Integrated Healthcare Solutions	Achievement Tests Self presentation Project Individual Skills	Self learning

10. Course Evaluation

13. Assessments:		Type of Assessment Description						
Weighting		Theory				Practical		
Course Work	Total	T.1	T.2	seminar	Atten+quize			
	50	15	15	10	10			
Final	Total	Theory				Practical		
	50	50				-		
Total	100							

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> Michael Nowicki, EdD, FACHE, FHFMA. Introduction to the Financial Management of Healthcare Organizations, Sixth Edition, 2014. Peter C. Olden, PhD, LFACHE Cathleen O. Erwin, PhD. Management of Healthcare Organizations: Introduction, Fourth Edition, 2024.
Main references (sources)	Patrice L. Spath, Introduction to Healthcare Quality Management, Third Edition, 2018.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	➤ https://study.com/academy/course/sql-tutorial-training.html .

➤ <https://study.com/academy/course/health-303-healthcare-organization-management.html>.

Learning Outcome

Knowledge and Understanding

Students will be able to:

- **P1.** Describe the structure and financing mechanisms of national and international healthcare systems.
- **P2.** Explain core concepts in healthcare administration, including leadership models and sector roles.
- **P3.** Analyze legal and ethical frameworks guiding compliance, patient rights, and institutional governance.
- **P4.** Examine challenges specific to the Iraqi healthcare system and explore feasible reform strategies.
- **P5.** Summarize principles of healthcare marketing, quality improvement, and integrated service delivery.

Cognitive and Critical Thinking Skills

Students will be able to:

- **P6.** Critically evaluate healthcare policies and leadership strategies across diverse contexts.
- **P7.** Assess economic and operational models affecting care accessibility, including supply chain and reimbursement systems.
- **P8.** Debate ethical dilemmas and predict impacts of innovations such as telehealth on system sustainability.

Practical and Professional Skills

Students will demonstrate ability to:

- **P9.** Develop strategic proposals to improve healthcare delivery and public health outcomes.
- **P10.** Apply regulatory and institutional guidelines in preparing compliance documentation and performance reporting.
- **P11.** Communicate professionally with stakeholders using marketing and advocacy principles tailored to healthcare.

□ Course Topic-to-Learning Outcome Alignment

Topic Sequence	Supports Learning Outcomes
Overview of Healthcare Systems	P1, A1
Administration	P2, B3
Structure, Key Divisions, Insurance Plans, and Key Industries	P1, P2, A1
Comprehensive Overview of Health Care Delivery and Reform	P4, P6, A4
Healthcare Safety Net, Quality, Efficiency, and Global Data Insights	P5, P6, A3
Legal and Regulatory Aspects of Healthcare Compliance and Protection	P3, P10, A2, C2
Ethical Considerations in Medical Practice and Decision Making	P8, C1
Overview and Challenges of the National Iraqi Healthcare System	P4, A4
Standard Tests 1	Course-Level Outcomes P1, P2, P4, P5, P3, P10, P8, P6 Program-Level Outcomes: A1, A2, A3, A4, B3, C1, C2
Healthcare Policy, Regulation, Financing, and Reimbursement	P6, P7, A1, B1
Leadership and Management in Population Health	P2, P6, B3
Marketing, Communications, and Quality Improvement in Healthcare	P5, P11, B2
Standard Tests 2	Course-Level Outcomes: P2, P5, P6, P7, P11 Program-Level Outcomes: A1, B1, B2, B3
Quality Improvement, Supply Chain Management, and Workforce Development	P7, P9, B1
Telehealth, Ethics, Law, and Emergency Preparedness Innovations	P8, A3, C1, C2
Patient-Centric and Economically Sustainable Integrated Healthcare Solutions	P9, A4

IMS413 – Health Care Systems Administration I, course is designed to **satisfy all program-level learning outcomes across knowledge (A1–A4), skills (B1–B4), and ethics (C1–C2).**

However, in formal curriculum review or accreditation terms, it’s worth noting that while a course may *contribute to* or *support* all program learning outcomes, mastery often builds across multiple courses. So IMS413 serves as a **foundational anchor**, especially for outcomes related to:

- Healthcare systems analysis (A1, A4)
- Ethical and legal practice (A2, C1, C2)
- Applied AI and digital solutions (A3, B1, B4)
- Communication and leadership (B2, B3)

Course Description Form

Course Name: Cloud Computing					
1. Course Code: BMI411					
2. Semester / Year:4					
Semester 7 / 2025-2026					
3. Description Preparation Date:					
1/10/2025					
4. Available Attendance Forms:					
Yes, Google sheet					
5. Number of Credit five (Total) / Number of Units (Total) 125					
6. Course administrator's name (mention all, if more than one name)					
Name: Dr. Ghaith Jaafar Mohammed					
Email: p031620012@student.utm.edu.my					
7. Course Objectives					
<p>Course Objectives</p> <p>This module aims to provide students with comprehensive knowledge and practical skills in cloud computing technologies and architectures. Students will learn to design, implement, and manage cloud solutions using industry-standard platforms and best practices. The course bridges theoretical foundations with hands-on experience, preparing students for careers in cloud architecture, DevOps, and cloud-native development.</p>					
8. Teaching and Learning Strategies					
Strategy		Traditional lectures, laboratory sessions, Multimedia presentations and animation videos and group discussions.			
9. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	Understand cloud computing concepts and characteristics	Introduction to Cloud Computing	Lecture, discussion, exploratory learning	Short quiz, class participation

2	2+2	Explain virtualization, hypervisors, and containerization	Virtualization & Containers	Lecture, hands-on lab (Docker)	Lab exercise, performance check
3	2+2	Identify and differentiate IaaS, PaaS, SaaS	Cloud Service Models	Lecture, group comparison, activities	MCQ quiz, group activity
4	2+2	Compare public, private, hybrid, and community models	Cloud Deployment Models	Lecture, case studies, cooperative learning	Short quiz + scenario-based questions
5	2+2	Understand virtual networks, subnets, VPN, load balancers	Cloud Networking	Lecture, diagram-based learning, lab	Lab task, participation
6	2+2	Explain grid computing and clusters + differences	Grid & Cluster Computing	Lecture, exploratory, problem solving	Short quiz
7	2+2	Assess knowledge gained in Weeks 1–6	1st Mid-Term Exam	Exam	Written exam
8	2+2	Explain cloud storage types and cloud databases	Cloud Storage & Databases	Lecture, lab, demonstration	Lab report
9	2+2	Identify cloud security	Cloud Security & Privacy	Lecture, discussion,	MCQ quiz

		threats and privacy concerns		real-world examples	
10	2+2	Understand cloud orchestration, DevOps, CI/CD	Cloud Management & DevOps	Lecture + practical lab (tools demo)	Lab assignment
11	2+2	Develop simple cloud-based applications	Cloud Application Development	Project-based learning, hands-on	Small project submission
12	2+2	Explore AI, edge computing, serverless, IoT cloud	Future Trends & Emerging Technologies	Interactive lecture, exploration	Reflection assignment
13	2+2	Assess knowledge from Weeks 8–12	2nd Mid-Term Exam	Exam	Written exam
14	2+2	Present final cloud-based project	Final Project Presentations	Presentation + peer review	Project evaluation rubric
15	2+2	Prepare students for final exam	Final Exam Review	Review session, discussion	Participation

10. Course Evaluation

Group	Grade	التقدير	Marks %	Definition
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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

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Handbook of Cloud Computing by Borko Furht · Arma Escalante
Main references (sources)	Handbook of Cloud Computing by Borko Furht · Arma Escalante
Recommended books and references (scientific journals, reports...)	<ul style="list-style-type: none"> • Zen of Cloud_ Learning Cloud Computing by Examples Ed 2. • The Complete Cloud Computing Manual - 5th Edition 2020 PDF
Electronic References, Websites	

Course Description Form

Course Name: Big Data Analysis in Healthcare	
1. Course Code: IMS416	
2. Semester / Year: 4 Semester 7\2025-2026	
3. Description Preparation Date: 1/9/2025	
4. Available Attendance Forms: Hybrid attendance	
5. Number of Credit five (Total) / Number of Units 5 (Total): 125 h	
6. Course administrator's name (mention all, if more than one name)	
Name: Dr. Atyaf Sami Noori Email: dr.atyaf.sami@uoitc.edu.iq	
7. Course Objectives	
Course Objectives	The course objective is to understand healthcare systems, ethical and legal healthcare issues, management functions, leadership styles, and healthcare marketing concepts. Upon completion of the module, you will be able to: <ul style="list-style-type: none"> • Describe the concepts and theories of healthcare management system. • Demonstrate new skills through the use of materials, tools, and/or technology that are central to healthcare management. • Interpret and explain significant laws and ethics of healthcare management and delivery. • Students explore health care

systems in both developed and developing countries

8. Teaching and Learning Strategies

Strategy	<p>Blended Teaching Approach</p> <ul style="list-style-type: none"> • Use a combination of theoretical lectures and hands-on practical sessions to ensure conceptual understanding and applied skills. • Supplement in-class lectures with online resources, short videos, and interactive tools for self-paced learning.
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9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 st	2	1.Explain the importance of Big Data in modern applications. 2.Identify major sources of Big Data across various industries.	INTRODUCTION TO Big Data	blended learning	Achievement Tests Oral presentation Project Individual Skills
2 nd	2	Define Big Data and describe its key characteristics (Volume, Velocity, Variety, Veracity, Value).	Characteristics of Big Data	blended learning	Achievement Tests Oral presentation Project Individual Skills
3 rd	2	Students should be able to: <ul style="list-style-type: none"> • Describe how HDFS stores and replicates large datasets across clusters. • Explain the roles of the NameNode, Secondary NameNode, and DataNodes. • Demonstrate how files are written to and read from HDFS. 	HDFS (Hadoop Distributed File System)	blended learning	Achievement Tests Oral presentation Project Individual Skills

4 th	2	1.Explain the MapReduce programming model and its components (Mapper, Reducer). 2.Understand data flow in a MapReduce job.	Map Reduce	blended learning	Achievement Tests Oral presentation Project Individual Skills
5 th	2	1.Analyze the performance of MapReduce jobs and identify bottlenecks. 2. Evaluate the limitations of MapReduce compared to modern frameworks like Spark.	Map Reduce	blended learning	In Achievement Tests Oral presentation Project Individual Skills
6 th	2		Midterm Exam	blended learning	Standard Tests1
7 th	2	Students should be able to: 1.Define predictive analytics and explain its role in decision-making. 2.Understand the challenges of running predictive models in low-resource environments. 3.Select appropriate machine learning techniques for limited data, limited computing, or limited connectivity.	Predictive Analytics in Resource-Constrained Environments	blended learning	Achievement Tests Oral presentation Project Individual Skills
8 th	2	Students should be able to: 1.Apply Big Data and predictive analytics concepts to real COVID-19 datasets. 2.Use data to evaluate public-health interventions and outcomes during the pandemic. 3.Identify data challenges specific to Iraq (underreporting, regional disparities, data delays).	Case Study: COVID-19 Data Analysis in Iraq	blended learning	Achievement Tests Oral presentation Project Individual Skills

9 th	2	<p>Students should be able to:</p> <ol style="list-style-type: none"> 1. Identify major public health challenges in Iraq and their root causes. 2. Analyze the impact of displacement, conflicts, and infrastructure issues on disease spread. 3. Understand data limitations in conflict-affected environments. 4. Propose data-driven and predictive solutions to improve health outcomes. 	<p>Public Health Challenges in Iraq: Infectious Diseases, Displacement, Access to Care</p>	blended learning	<p>Achievement Tests Oral presentation Project Individual Skills</p>
10 th	2	<p>Students should be able to:</p> <ol style="list-style-type: none"> 1. Explain the purpose and components of electronic health records. 2. Identify barriers to EHR adoption in developing countries, especially Iraq. 3. Evaluate the benefits of digitizing health information systems. 4. Propose strategies for improving data quality, privacy, and interoperability. 	<p>Electronic Health Records: Challenges and Opportunities.</p>	blended learning	<p>Achievement Tests Oral presentation Project Individual Skills</p>
11 th	2	<p>Students should be able to:</p> <ol style="list-style-type: none"> 1. Understand the importance of workforce analytics in health-system planning. 2. Analyze gaps in the distribution of doctors, nurses, and specialists across regions. 3. Use data to identify workforce shortages and predict future needs. 	<p>Health Workforce Analytics: Distribution and Gaps.</p>	blended learning	<p>Achievement Tests Oral presentation Project Individual Skills</p>

		4.Recommend policy or data-driven strategies to improve workforce distribution.			
12 th	2	<p>By the end of this topic, students should be able to:</p> <ol style="list-style-type: none"> 1.Explain the basic concepts of Geographic Information Systems (GIS) and spatial data types. 2.Understand the role of spatial analysis in studying healthcare access and health inequalities. 3.Interpret and create basic spatial visualizations such as heat maps, choropleth maps, and spatial clusters. 4.Analyze geographic barriers to healthcare access (distance, transportation, facility distribution). 5.Use GIS tools (e.g., QGIS, ArcGIS, Python libraries) to perform spatial queries and buffering analyses. 6.Evaluate healthcare facility distribution and identify underserved areas based on spatial data. 	GIS and Spatial Analysis for Healthcare Access.	blended learning	<p>Achievement Tests Oral presentation Project Individual Skills</p>
13 th	2	<p>By the end of this topic, students should be able to:</p> <ol style="list-style-type: none"> 1.Explain the ethical principles related to healthcare data, including autonomy, beneficence, and justice. 2.Understand key 	Ethics and Privacy in Healthcare Data.	blended learning	<p>Achievement Tests Oral presentation Project Individual Skills</p>

		<p>privacy concerns when handling personal health information (PHI).</p> <p>3. Identify global and regional standards/frameworks for data protection (HIPAA, GDPR, local regulations).</p> <p>4. Recognize risks associated with data sharing, data linkage, and algorithmic bias.</p> <p>5. Apply best practices for anonymization, encryption, access control, and secure data storage.</p> <p>6. Evaluate ethical dilemmas in predictive analytics, EHR systems, and public health surveillance.</p> <p>7. Demonstrate responsible decision-making when designing or using data-driven health systems.</p>			
14 th	2		Final Project Presentations.	blended learning	Achievement Tests Oral presentation Project Individual Skills
15 th	2		Precreation for the final exam	blended learning	Achievement Tests Oral presentation Project Individual Skills
10. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc					
11. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Big Data in Healthcare: Exploring Emerging Technologies and Applications by Marconi		

	& Lehmann
Main references (sources)	Big Data in Healthcare: Exploring Emerging Technologies and Applications by Marconi & Lehmann
Recommended books and references (scientific journals, reports...)	WHO and Ministry of Health Iraq reports
Electronic References, Websites	research articles on public health in Iraq Public datasets: COVID-19 dashboards, health worker statistics, national health surveys

Course Description Form

Course Name: Clinical Data mining

1. Course Code: IMS414

2. Semester / Year:4

2025-2026 / Semester 7

3. Description Preparation Date:

1/9/2025

4. Available Attendance Forms:

Direct.

5. Number of Credit five (Total) / Number of Units (Total): 5 Hours\125.

6. Course administrator's name (mention all, if more than one name)

Name: Zainab Mustafa Ridha

Email: zainab.mustafa@uoitc.edu.iq

7. Course Objectives

Course Objectives

1. Provide students with a solid foundation in **data mining concepts, methods, and tools** relevant to clinical and healthcare data.
2. Develop students' ability to **analyze, interpret, and extract meaningful patterns** from large and complex clinical datasets.
3. Equip students with the skills to build and evaluate **predictive models** that support clinical decision-making and patient care.
4. Foster awareness of the **ethical, legal, and professional responsibilities** associated with handling sensitive healthcare data.
5. Prepare students to apply data mining techniques in **real-world healthcare environments**, bridging the gap between data science and clinical practice.

8. Teaching and Learning Strategies

Strategy	<ul style="list-style-type: none"> • Lectures (Theoretical Learning). • Practical / Laboratory Sessions. • Case Studies & Problem-Based Learning (PBL). • Group Projects and Presentations. • Self-Directed Learning (SDL). • Interactive Discussions & Seminars. • Blended Learning / E-Learning Tools. • Assessment-Integrated Learning: <ul style="list-style-type: none"> • Midterm and final exams focus on both theory and applied problem-solving. • Assignments and lab exercises ensure progressive skill-building. • Project-based learning to synthesize knowledge and demonstrate practical competence.
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9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Define clinical data mining and explain its role in modern healthcare systems.	Introduction to Clinical data mining	Lecture	Class Discussion
2	2	Distinguish between structured (EHRs, lab results) and unstructured (clinical notes, imaging) data.	Clinical data sources and types	Lecture, Practical Lab Session	Class Discussion, Lab work
3	2	Explain the importance of preprocessing in clinical data mining.	Data preprocessing and Cleaning	Lecture, Practical Lab Session, Reading Assignments	Class discussion, Assignment discussion, Lab Work
4	2	Perform normalization, discretization, and outlier detection on clinical datasets.	Data preprocessing and Cleaning II	Lecture, Practical Lab session	Class Discussion, Quiz, Lab Work
5	2	Apply dimensionality reduction and feature extraction methods for clinical datasets.	Data transformation and feature selection	Lecture, Practical Lab Session, Reading Assignments	Class Discussion, Lab work, Reading Assignments
6	2	Implement decision trees and naïve Bayes classifiers on medical datasets.	Classification Methods (Decision Trees, Naïve Bayes)	Lecture, Practical Lab Session	Class Discussion, Lab work

7	2	Assess students' understanding of fundamental concepts covered in weeks 1–6.	Midterm Exam	Exam	Exam
8	2	Apply logistic regression and support vector machines to healthcare prediction problems.	Classification Methods II (Logistic Regression, SVM)	Lecture, Practical Session	Lab Class Discussion, Lab work, assignment
9	2	Implement clustering algorithms for grouping patients or diseases.	Clustering Techniques (k-Means, Hierarchical)	Lecture, Practical Session, Assignments.	Lab Reading Class Discussion, Lab wor
10	2	Apply association rule mining to discover hidden relationships in clinical data (e.g., comorbidities, drug interactions).	Association Rule Mining in Healthcare	Lecture, Practical session	Lab Quiz, Class Discussion, Lab Work
11	2	Build and interpret regression models for predicting health outcomes.	Regression Models in Medical Data	Lecture, Practical session	Lab Class Discussion, Lab Work
12	2	Apply natural language processing (NLP) methods to extract knowledge from unstructured clinical text.	Text Mining in Clinical Notes	Lecture, Practical session	Lab Class Discussion, Lab Work
13	2	Explore advanced topics such as deep learning, temporal mining, and web-based healthcare analytics.	Advanced Medical Data Mining / Web Data Mining	Lecture, Practical session	Lab Class Discussion, Lab Work
14	2	Discuss the student's presentation about some data mining techniques and algorithms topics	Final presentations	Discuss the presentation	Presentation's discussion
15	2	Explain any students questions	Preparatory week before the final Exam	Class discussion	Class discussion

10.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

Weight (Marks)	
Quizzes	5% (5)
Assignments	5% (5)
attendance	5% (5)
Seminar	5% (5)
Midterm Exam	10% (10)
Practical learning (Lab.)	20% (20)
Final Exam	50% (50)
Total points	100% (100)

11.Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. J. Han and M. Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers. 2. M.H. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education. 3. Pang-Ning Tan, Michael Steinbach, and Vipin Kumar, "Introduction to Data Mining", Pearson Education.
Main references (sources)	Books, academic journals, and Websites.
Recommended books and references (scientific journals, reports...)	1. Prabhu, "Data Warehousing - Concepts, Techniques, Products and Applications", Prentice Hall of India. 2. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", Tata McGraw Hill Edition.
Electronic References, Websites	Kaggle Datasets – A wide variety of datasets for competition and practice.

Course Description Form

Course Name: Simulation and Modeling	
1. Course Code: IMS415	
2. Semester / Year: 4 Semester 7/2025–2026	
3. Description Preparation Date: 9/11/2025	
4. Available Attendance Forms: (Blended / Hybrid)	
5. Number of Credit five (Total) / Number of Units (Total): 5 / 125	
6. Course administrator's name (mention all, if more than one name)	
Name: Noor Sabah Abbas Email: noor.sabah@uoitc.edu.iq	
7. Course Objectives	
Course Objectives	1. Theoretical Objectives (Lectures) By the end of the theoretical part of this course, students should be able to: <ol style="list-style-type: none"> 1. Understand the fundamentals of healthcare simulation: <ul style="list-style-type: none"> ○ Explain the concepts of discrete-event, agent-based, and system dynamics simulation. ○ Describe the role and benefits of simulation in healthcare systems (hospitals, clinics, emergency departments, etc.). 2. Model healthcare processes: <ul style="list-style-type: none"> ○ Identify key components and variables in healthcare systems (patients, staff,

resources, queues).

- Develop conceptual models of healthcare workflows.

3. Analyze system performance:

- Apply simulation methods to evaluate performance metrics (waiting times, resource utilization, patient throughput).
- Interpret results for decision-making and quality improvement.

4. Design and validate simulation models:

- Understand model verification and validation techniques.
- Critically evaluate assumptions and limitations of healthcare simulation models.

5. Understand applications of healthcare simulation:

- Explore case studies such as patient flow optimization, emergency response planning, and resource allocation.
- Understand how simulation supports evidence-based healthcare management.

2. Practical Objectives (Laboratory using AnyLogic)

By the end of the laboratory sessions, students should be able to:

1. Use AnyLogic software for healthcare modeling:

- Build discrete-event, agent-based, and hybrid models in AnyLogic.
- Create patient flow models for different hospital departments (ER, ICU, outpatient clinics).

2. Implement and simulate scenarios:

- Configure model parameters and input data (arrival rates, service times, staff schedules).
- Run simulation experiments and collect results.

3. Analyze and interpret simulation outputs:

- Generate key performance indicators (KPIs) such as average waiting time, queue length, and resource utilization.
- Use charts, graphs, and dashboards in

	<p>AnyLogic to visualize results.</p> <p>4. Optimize healthcare processes:</p> <ul style="list-style-type: none"> ○ Test “what-if” scenarios (e.g., adding staff, changing schedules, resource allocation changes). ○ Propose recommendations based on simulation findings. <p>5. Report and document simulation projects:</p> <ul style="list-style-type: none"> ○ Prepare structured reports including model design, assumptions, results, and recommendations. ○ Demonstrate reproducibility and clarity in presenting simulation studies.
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8. Teaching and Learning Strategies

Strategy	<p>1. Theoretical Lectures</p> <ul style="list-style-type: none"> • Interactive Lectures: <ul style="list-style-type: none"> ○ Present core concepts of simulation methods (discrete-event, agent-based, system dynamics). ○ Use healthcare case studies to illustrate theory. • Class Discussions: <ul style="list-style-type: none"> ○ Encourage students to analyze real-world healthcare problems and discuss possible modeling approaches. • Problem-Solving Sessions: <ul style="list-style-type: none"> ○ Solve exercises on modeling patient flow, resource allocation, and queueing in healthcare systems. • Guest Lectures / Seminars (Optional): <ul style="list-style-type: none"> ○ Invite healthcare simulation practitioners to share insights and best practices. <p>2. Laboratory / Practical Sessions (AnyLogic)</p> <ul style="list-style-type: none"> • Hands-On Simulation Exercises: <ul style="list-style-type: none"> ○ Build and run models using AnyLogic software for healthcare scenarios. ○ Implement patient flow, staffing, and resource management models. • Scenario Analysis / “What-If” Studies: <ul style="list-style-type: none"> ○ Test different scenarios to see how changes affect performance metrics. • Group Projects: <ul style="list-style-type: none"> ○ Work in teams to develop a full healthcare simulation project, from conceptual modeling to result interpretation. • Software Tutorials & Guided Exercises: <ul style="list-style-type: none"> ○ Step-by-step guided tasks to learn AnyLogic functionalities and modeling techniques.
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3. Independent Learning

- **Reading Assignments:**
 - Research papers, book chapters on healthcare simulation and modeling techniques.
- **Model Documentation Practice:**
 - Students prepare reports documenting assumptions, model structure, and simulation results.

4. Assessment-Integrated Learning

- **Quizzes & Mini-Assignments:**
 - Short exercises to reinforce theory and software skills.
- **Project-Based Assessment:**
 - Students demonstrate their ability to model and simulate a healthcare process using AnyLogic.
- **Peer Review / Feedback:**
 - Encourage critique and discussion of classmates' models and reports.

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Understand the role of simulation and modeling in healthcare systems.	Introduction to Simulation in Healthcare	Lecture, Discussion	Quiz, Participation
2	4	Describe basic modeling concepts and types of simulations.	Types of Simulation Models	Lecture, Case Studies	Short Quiz
3	4	Identify components of healthcare systems suitable for simulation.	Healthcare System Components	Lecture, Group Work	Assignment
4	4	Understand modeling process steps: problem definition, conceptualization, data collection.	Simulation Process Overview	Lecture, Practical Discussion	Quiz
5	4	Demonstrate knowledge of discrete-event simulation concepts.	Discrete-Event Simulation in Healthcare	Lecture + Lab (AnyLogic Intro)	Lab Exercise
6	4	Use AnyLogic interface to create simple healthcare process models.	AnyLogic Environment and Tools	Lab Practice	Lab Evaluation
7	4	Apply agent-based modeling in healthcare settings.	Agent-Based Simulation Concepts	Lecture + Lab	Lab Report
8	4	Develop hybrid models combining discrete and agent-based techniques.	Hybrid Modeling Approaches	Lecture + Lab	Assignment

9	4	Analyze and interpret simulation outputs.	Output Analysis and Interpretation	Lecture + Lab	Quiz, Lab Report
10	4	Perform sensitivity analysis and scenario comparison.	Sensitivity Analysis in AnyLogic	Lecture + Lab	Lab Evaluation
11	4	Apply optimization and resource allocation in healthcare simulations.	Optimization Models	Lecture + Lab	Project Work
12	4	Validate and verify healthcare simulation models.	Validation and Verification	Lecture + Lab	Quiz, Lab Report
13	4	Integrate multiple models for complex healthcare systems.	Integrated Simulation Systems	Lecture + Lab	Group Project
14		Final Exam.			

10. Course Evaluation

13. Assessments:		Type of Assessment Description							
	Weighting	Theory					Practical		
Course Work	Total	T.1	T.2	seminar	Presentation +assignment	Atten+quize	T.1	T.2	Project
		50	10	10	5	5	5	5	5
Final	Total	Theory					Practical		
	50	50					-		
Total	100								

11. Learning and Teaching Resources

Required textbooks (curricular books if any)	<ol style="list-style-type: none"> 1. The Comprehensive Textbook of Healthcare Simulation (Levine et al., 2013) 2. Discrete-Event System Simulation (5th Edition) by Jerry Banks, John S. Carson II, Barry L. Nelson & David M. Nicol 3. Simulation Modeling and Analysis, 5th Edition by Averill M. Law: 4. The Big Book of Simulation Modeling: Multimethod Modeling with AnyLogic 8 by Andrei Borshchev & Ilya Grigoryev
Main references (sources)	<ol style="list-style-type: none"> 1. Operations Research and Simulation in Healthcare (Masmoudi, Jarb & Siarry, 2021) 2. System Dynamics Models for Public Health and Health Care Policy (Homer & Hirsch, 2023) 3. Modeling and Simulation in Python by Allen B. Downey
Recommended books	<ol style="list-style-type: none"> 1. Modeling and Simulation in Medicine and the Life Sciences (Peskin)

and references (scientific journals, reports...)	Hoppensteadt, edition 2) 2. Modeling and Simulation in Medicine and the Life Sciences by Fran Hoppensteadt and Charles S. Peskin 3. Multi-Agent Systems for Healthcare Simulation and Model Applications for System Improvement by Raman Paranjape & A Sadanand.
Electronic Websites	www.Anylogic.com

Courses Description Forms

Course Name: Electronic Health Records	
1. Course Code: IMS421	
2. Semester / Year: 4 Semester 7/2025-2026	
3. Description Preparation Date: 18/10/2025	
4. Available Attendance Forms: Theoretical and practical / Class Attendance Register	
5. Number of Credit Hours (Total) / Number of Units (Total)	
125/5	
6. Course administrator's name (mention all, if more than one name)	
Name: Zainab N. Al-qudsy Email: dr.zainab.n.yousif@uoitc.edu.iq	
7. Course Objectives	
Course Objectives	<p>The course aims to introduce students to the electronic health record (EHR) in terms of contents, usefulness and application, with a strong focus on the role of electronic health record systems in healthcare operations. The main objectives of this are:</p> <ul style="list-style-type: none"> • Deep understanding of the role of electronic health records in ensuring quality of care and evidence-based practice. • Understanding of how electronic health records are applied in clinical practice • Analyze EHR workflow and adapt to changes • Meaningful use of electronic health records and health care data systems. • Practice with electronic medical record data and healthcare database. • Knowledge of SQL fundamentals and their application to design and implement a real healthcare system <p>Advanced experience in dealing with complex SQL expressions</p>
8. Teaching and Learning Strategies	
Strategy	<ul style="list-style-type: none"> - Blended-Learning - Self-Learning

- Learning by Experimentation
- Brainstorming

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Introduction to EHRs & SQL basics	P1, P5 → A1, B1	Achievement Tests Oral presentation Project Individual Skills	blended learning
2	4	Benefits, Challenges of EHRs; SSMS Setup	P1, P4, P5 → A1, B1	Achievement Tests Oral presentation Project Individual Skills	blended learning
3	4	Database Design & SSMS Operations	P2, P5, P6 → A2, B2	Achievement Tests Oral presentation Project Individual Skills	blended learning
4	4	EHR Workflow & Data Operations	P2, P3, P5, P6 → A1, B1, B2	Achievement Tests Oral presentation Project Individual Skills	blended learning
5	4	Key Terminology & Primary	P2, P3, P6 → A2, B1	In Achievement Tests	blended learning

		Keys in Tables		Oral presentation Project Individual Skills	
6	4	Regulations & Data Retrieval	P4, P7 → A4, B3	Achievement Tests Oral presentation Project Individual Skills	blended learning
7	4	Wildcards, Aggregates & Grouping	P7 → B3	Standard Tests 1	ded learning
8	4	EHR vs EMR & Conditional SQL	P1, P7 → A1, B3	Achievement Tests Oral presentation Project Individual Skills	blended learning
9	4	EHR Types & Data Updates	P2, P6 → A2, B2	Achievement Tests Oral presentation Project Individual Skills	blended learning
10	4	Informatics Standards & Temporary Tables	P4, P6, P7 → A4, B3	Achievement Tests Oral presentation Project Individual Skills	blended learning
11	4	Population Health & Table Joins	P3, P8 → A3, B2, B3	Achievement Tests Oral presentation	blended learning

				Project Individual Skills	
12	4	Standard Tests (Join Operations)	P6, P8 → B2, B4	Standard Tests2	blended learning
13	4	EHR Quality & Decision Support	P9, P10 → C1, C2	Achievement Tests Oral presentation Project Individual Skills	blended learning
14	4	Change Management & Real-World Data in EHR	P8, P9 → B4, C1	Achievement Tests Oral presentation Project Individual Skills	blended learning
15	4	Final Exam	All Outcomes → A	Achievement Tests Oral presentation Project Individual Skills	blended learning

10.Course Evaluation

		Type of Assessment Description							
Weighting		Theory					Practical		
Course Work	Total	T.1	T.2	seminar	Presentation +assignment	Atten+ quiz	T.1	T.2	Project
		50	10	10	5	5	5	5	5
Final	Total	Theory					Practical		
	50	50					-		
Total	100								

11.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> Carter, J.H. <i>.Electronic health record: A guide for clinicians and administrators.</i>Philadelphia: ACP Press. (ISBN 1930513976 9781930513976 <i>Practice Management and EHR: A To Patient Encounter for Medisoft Clinician FirstEdition, Susan M. Sanderson</i>
Main references (sources)	<ul style="list-style-type: none"> Elmasri, R. and Shamkant, B. N., “Fundamentals of Database Systems”, 5th Edition Addison-Wesley
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.udemy.com/course/data-analytics-intro-to-sql-using-healthcare-data-ssms

Learning Outcome

Electronic Health Record (EHR) course learning outcomes, from P1 to P10, covering all domains (Knowledge, Skills, Competencies):

Code	Learning Outcome
P1	Understand the history, legal foundations, and strategic value of EHR systems in healthcare.
P2	Recognize the components and architecture of advanced EHR systems.
P3	Describe how EHR data is stored, processed, and securely shared.
P4	Understand regulatory frameworks, informatics standards, and future developments in EHRs.
P5	Use SQL Server Management Studio to create, modify, and manage healthcare databases.
P6	Apply relational database concepts including joins, constraints, and normalization in EHR design.
P7	Utilize advanced SQL functions for data retrieval, manipulation, and reporting in clinical contexts.
P8	Prepare, analyze, and work with real-world healthcare data in EHR systems.
P9	Integrate EHR features with clinical workflows to enhance quality, efficiency, and care outcomes.

Code	Learning Outcome
P10	Evaluate implementation challenges of EHR systems and propose context-aware, standards-driven solutions.

Topic–Outcome Alignment Table with the **third and fourth columns merged** to show how each topic supports both the **specific course outcomes (P1–P10)** and the **broader program-level domains (A, B, C)**:

■ **Topic–Outcome Mapping Table**

Week	Course Topic	Aligned Outcomes
1	Introduction to EHRs & SQL basics	P1, P5 → A1, B1
2	Benefits, Challenges of EHRs; SSMS Setup	P1, P4, P5 → A1, B1
3	Database Design & SSMS Operations	P2, P5, P6 → A2, B1, B2
4	EHR Workflow & Data Operations	P2, P3, P5, P6 → A2, B1, B2
5	Key Terminology & Primary Keys in Tables	P2, P3, P6 → A2, B2
6	Regulations & Data Retrieval	P4, P7 → A4, B3
7	Wildcards, Aggregates & Grouping	P7 → B3
8	EHR vs EMR & Conditional SQL	P1, P7 → A1, B3
9	EHR Types & Data Updates	P2, P6 → A2, B2
10	Informatics Standards & Temporary Tables	P4, P6, P7 → A4, B2, B3
11	Population Health & Table Joins	P3, P8 → A3, B2, B4
12	Standard Tests (Join Operations)	P6, P8 → B2, B4
13	EHR Quality & Decision Support	P9, P10 → C1, C2
14	Change Management & Real-World Data in EHR	P8, P9 → B4, C1
15	Final Exam	All Outcomes → A–C

IMS421 – Electronic Health Record Systems

This course is designed to support all program-level learning outcomes spanning **knowledge (A1–A4)**, **skills (B1–B4)**, and **competencies (C1–C2)**. While the course contributes broadly across the curriculum, formal accreditation practice recognizes that learning builds progressively across multiple modules. Thus, IMS4xx plays a pivotal role, particularly in the following areas:

- **EHR system architecture and database design** (A2, B1, B2)
- **Legal, regulatory, and informatics standards in healthcare IT** (A1, A4, C1)
- **Applied SQL for managing clinical data** (A3, B3, B4)
- **Evaluating HIT impacts on quality and efficiency of care** (C2)

Item	Details
1. Teaching Institution	University of Information Technology and Communication / Biomedical Informatics College
2. Department / Center	Intelligent Medical Systems
3. Course Title / Code	Digital Signal Processing
4. Modes of Attendance Offered	Direct
5. Semester / Year	First Semester / 2024–2025
6. Number of Hours Tuition (Total)	30 hours (Theoretical)
7. Date of Production of this Specification	15/9/2024
8. Aims of Course	Introducing the basics of digital signals and their types, key processes applied to them, and focusing on digital images—definition, types, analysis, enhancement, compression, and extraction of meaningful information for scientific purposes.

9. Course Outcomes and Methods of Teaching, Learning, and Assessment

A. Cognitive Goals

- Familiarize students with digital signals and images and the processes applicable to them.
- Enable understanding of image enhancement, preprocessing, and analysis for extracting key information.
- Teach practical application of image processing techniques for scientific use.

Teaching and Learning Methods:

- Board explanation and interactive presentations using data show.
- Self-learning through diverse educational resources.

Evaluation Methods:

- Achievement and standard tests.
- Individual skill presentations.
- Intellectual questions in exams.
- Daily assignment corrections.

B. Course-Specific Objectives

- Equip students with scientific thinking, innovation, and problem-solving skills.
- Apply scientific theories to practical experiences.

Teaching and Learning Methods:

- Board explanation and interactive presentations using data show.
- Self-learning through diverse educational resources.

Evaluation Methods:

- Daily and monthly exams.
 - In-class discussions.
 - Assignment corrections.
-

C. Emotional and Value Goals

- Prepare students to handle various types of digital images.
- Enable analytical thinking to select appropriate image processing methods.

Teaching and Learning Methods:

- Practical application aligned with theoretical content.
- Summarizing key topics and using data show presentations.

Evaluation Methods:

- Quick exams, monthly exams.
 - Group reports.
-

D. Transferred General and Rehabilitative Skills

- D1: Lifelong learning motivation and ability.
- D2: Problem-solving skills.
- D3: Confidence-building through discussion sessions.

Teaching and Learning Methods:

- Student teams preparing scientific reports.
- Traditional lecture narration, board summaries, and data show presentations.

Evaluation Methods:

- Quick exams, monthly exams.
- Group report evaluations.

Course Description Form

Course Name: Information Security In Healthcare	
1. Course Code: IMS425	
2. Semester / Year : 8 Sem. /4th Y	
3. Description Preparation Date:	
1/2/2026	
4. Available Attendance Forms:	
Full-time	
5. Number of Credit Hours (Total) / Number of Units (Total)	
125	
6. Course administrator's name (mention all, if more than one name)	
Name: Assistant Lecturer Zaid Ali Saeed Email: zaid.ali-bmic@uoitc.edu.iq	
7. Course Objectives	
Course Objectives	<ul style="list-style-type: none">• To develop problem solving skills and understanding of Security issues through the application of security techniques.• To understand the concept of cyber and cyber security.• To understand Encryption, Decryption and Key.• This course deals with the basic concept of secrecy methods.• To understand Authentication, Verification, and Confidentiality.• To understand type of cyber _attacks and threats.• To perform different traditional cryptosystems to secure cyber data transfer.• This is the basic subject for all cyber and network transmission.

8. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This can be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Define data security and Cyber security. Differentiate clearly between the two Concepts. Explain their importance in modern Digital systems.	Introduction to data security and cyber security (what is the difference)	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 2	2	Describe basic data Transmission models. Identify common security Threats. Classify different types of breaches and Cyber-attacks.	Basics of Data Transmission and Security Threats	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 3	2	Define steganography, Digital watermarking and cryptography. Compare Their purposes and applications. Analyse Differences between hiding In addition, encrypting data.	Steganography, Watermarking and Cryptography	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 4	2	Explain classical Cryptosystems. Describe stream cipher operation Principles. Compare traditional encryption With modern methods.	Traditional Cryptosystems and Stream Cipher	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 5	2	Apply monophonic Encryption techniques. Demonstrate how single-key substitution Ciphers operate. Evaluate their Strengths and weaknesses.	Monophonic Encryption Methods	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 6	2	Explain encryption methods Using multiple keys. Analyze how polyalphabetic ciphers Improve security. Implement Basic examples manually.	Polyalphabetic Encryption Methods	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 7	2	Assess students understanding of Week is 1–6 topics.	Mid-Term Exam	blended learning	Achievement Tests Oral presentation

					Project Individual Skills
Week 8	2	Describe homophonic Encryption techniques. Compare them with monoalphabetic and polyalphabetic methods. Evaluate security improvements.	Homophonic Encryption Methods	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 9	2	Explain the concept of One-Time Pad. Analyze its advantages and limitations. Justify why OTP is theoretically Unbreakable.	One-Time Pad (OTP)	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 10	2	Define block cipher Structure. Explain Feistel Network principles. Describe the DES algorithm architecture.	Block Cipher: Feistel DES	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 11	2	Identify DES initial permutation, expansion, S-boxes and P-boxes. Explain DES key Generation process. Analyze Round function steps.	DES Tables and Generation	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 12	2	Define DEA method. Compare DEA with DES in terms of structure and Security. Evaluate Improvements.	DEA and Comparison with DES	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 13	2	Explain secure multimedia transmission techniques. Analyze encryption challenges in multimedia systems. Propose protection strategies.	Multimedia Secure Transmission	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 14	2	Define cryptanalysis. Describe common cryptanalysis techniques. Outline systematic steps used by cryptanalysts.	Cryptanalysis Cryptanalyst Role	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 15	2	Differentiate between attacker and cryptanalyst roles. Analyze objectives and methodologies of each. Evaluate real-world scenarios.	Attacker vs Cryptanalyst	blended learning	Achievement Tests Oral presentation Project Individual Skills

10. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ol style="list-style-type: none">1- Cryptography and Network Security: Principles and Practice, William Stallings, Publisher: Pearson, Edition 5, 2010.2- Cybersecurity Essentials, Charles J. Brooks, Christopher Grow , Philip A. Craig Jr. , Donald Short, publisher: Sybex, Edition 1, 2017
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Cryptography & Network Security, 1st Edition, by Behrouz Forouzan, Publisher: McGraw-Hill Education, 2007.
Electronic References, Websites	<ol style="list-style-type: none">1- https://insider.ssi-net.com/insights/what-is-the-difference-between-data-security-and-cyber-security.2- https://www.secureworld.io/industry-news/cybersecurity-vs-data-security-definition3- https://www.777networks.co.uk/data-security-vs-cyber-security-whats-the-difference/

Course Description Form

1. Course Name: Medical Multimedia	
2. Course Code: IMS426	
3. Semester / Year: 8 & 4	
(S. 2 / 2025-2026)	
4. Description Preparation Date:	
4 th of February, 2026	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
125h (theoretical and practical) / 5	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Ghaith Jaafar Mohammed Email: dr.ghaith.jaafar@uoitc.edu.iq	
8. Course Objectives	
<p>Course Objectives</p>	<p>The Medical Multimedia course aims to equip students with both theoretical knowledge and practical skills related to the use of multimedia technologies in healthcare. Specifically, the course objectives are to:</p> <ul style="list-style-type: none"> • Develop a solid understanding of multimedia concepts and principles and their applications in medical and healthcare contexts. • Enable students to design and create medical 3D models and animations using Blender 3D to enhance visualization, education, and communication. • Train students to apply multimedia technologies effectively for medical

education, patient awareness, and clinical training.

- Raise awareness of **ethical, legal, and professional considerations** related to medical multimedia content creation and usage.
- Introduce students to **emerging trends and future directions** in medical multimedia, including immersive and interactive technologies.

9. Teaching and Learning Strategies

Strategy

Teaching Strategies

- **E-Learning:** Delivery of theoretical concepts through digital materials, presentations, and online resources to support flexible learning.
- **Direct Instruction:** Structured lectures introducing foundational concepts, tools, and frameworks in medical multimedia.
- **Demonstration-Based Teaching:** Instructor-led demonstrations of Blender 3D tools and multimedia workflows.

Learning Strategies

- **Learning by Experimentation:** Hands-on practice with Blender 3D, allowing students to learn by creating medical models, animations, and visualizations.
- **Self-Learning:** Encouraging independent exploration of tools, tutorials, and case studies to reinforce classroom learning.
- **Cooperative Learning:** Group-based activities and collective projects that promote teamwork, collaboration, and peer learning.
- **Indirect Learning:** Learning through case studies, reflection on industry practices, and analysis of real-world medical multimedia applications.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	<ul style="list-style-type: none"> • Understand the fundamental concepts of medical multimedia and its 	INTRODUCTION	direct	direct questions

		<p>significance in healthcare.</p> <ul style="list-style-type: none"> • Familiarize with Blender 3D as a tool for creating medical content. 			
2	2+2	<ul style="list-style-type: none"> • Recognize various real-world applications in clinical, educational, and research settings. • Analyze how multimedia enhances healthcare communication. 	Applications of Medical Multimedia	direct	direct questions
3	2+2	<ul style="list-style-type: none"> • Apply basic image processing techniques in Blender. • Demonstrate rigging and animation for medical visualization. 	Integrating Image Processing with Animation and Rigging in Blender 3D	direct	direct questions
4	2+2	<ul style="list-style-type: none"> • Explain volume rendering principles in medical imaging. • Perform segmentation and rigging on medical datasets. 	Volume Rendering, Rigging, and Segmentation	direct	direct questions
5	2+2	<ul style="list-style-type: none"> • Describe VR and AR concepts relevant to healthcare. • Evaluate the impact of immersive technologies in medical training and treatment. 	Virtual Reality and Augmented Reality in Medical Multimedia	direct	direct questions
6	First Exam				
7	2+2	<ul style="list-style-type: none"> • Understand key principles of user-centered design. • Design intuitive and accessible medical interfaces. 	UX/UI Design in Medical Multimedia	direct	direct questions
8	2+2	<ul style="list-style-type: none"> • Outline the stages of the MDLC for 	Multimedia Development Life	direct	direct questions

		<p>medical applications.</p> <ul style="list-style-type: none"> • Implement MDLC using Blender for project development. 	Cycle (MDLC) in Medical Multimedia and Blender 3D		
9	2+2	<ul style="list-style-type: none"> • AI-assisted segmentation and animation concepts • Examples of AI-generated medical visuals. • Integration of multimedia with intelligent medical systems 	AI-Assisted Medical Multimedia and Visualization	direct	direct questions
10	2+2	<ul style="list-style-type: none"> • Medical accuracy and validation of multimedia content • Clinical reliability and risk of misinterpretation in medical visuals • Standards and guidelines for medical visualization and animations 	Medical Multimedia Validation, Accuracy, and Regulatory Standards	direct	direct questions
11	2+2	<ul style="list-style-type: none"> • Identify ethical issues related to medical content creation. • Apply ethical guidelines in multimedia development. 	Ethical Considerations in Medical Multimedia	direct	direct questions
12	2+2	<ul style="list-style-type: none"> • Analyze case studies of successful medical multimedia projects. • Reflect on challenges and solutions from industry practices. 	Case Studies and Industry Insights	direct	direct questions
13	2 nd Exam				

14	2+2	<ul style="list-style-type: none"> Identify new technologies shaping medical multimedia. Predict future developments and their potential impact. 	Emerging and Directions	Trends Future	direct	direct questions
15	2+2	<ul style="list-style-type: none"> Deliver a professional presentation of the group project using effective communication strategies. Evaluate peer projects critically, providing constructive feedback based on presentation criteria. 	Collaborative Project Development		direct	direct questions

11. Course Evaluation

	Weighting	Theory					Practical				
Course Work	Total	T.1	T.2	Assig.	Quiz	Atten.	T.1	T.2	Proj.		Atten.
	50	10	10	2	3	5	5	5	5		5
Final	Total	Theory					Practical				
	50	30					20				
Total	100										

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Medical Multimedia: Concepts, Methodologies, Tools and Applications" edited by Valentina Emilia Bakić, Lakhmi C. Jain, and Branko Kovačević , and "Blender Basics: Second Edition" by Gordon Fisher
Main references (sources)	
Recommended books and references (scientific journals, reports...)	None
Electronic References, Websites	https://www.blender.org/

Course Description Form

Course Name: Healthcare Systems Administration II

1. Course Code: IMS424

2. Semester / Year: 4 Semester 8/2025-2026

3. Description Preparation Date: 2026-1-15

4. Available Attendance Forms: Full Time

5. Number of Credit Hours (Total) / Number of Units (Total) 60 Hours
125 / 5

6. Course administrator's name (mention all, if more than one name)

Name: Dr. Ahmed Majid Taha

Email: dr.ahmed_majid@uoitc.edu.iq

7. Course Objectives

Course Objectives

- Develop comprehensive understanding of healthcare delivery systems and their management
- Build competency in healthcare organizational leadership and administration
- Foster understanding of healthcare policy and regulatory frameworks
- Develop skills in healthcare financial management and quality improvement
- Enable strategic thinking in healthcare administration
- Prepare students for leadership roles in healthcare organizations

8. Teaching and Learning Strategies

Strategy**8. Teaching and Learning Strategies**

- Blended-Learning
- Self-Learning
- Learning by Experimentation
- Brainstorming
- E-Learning
- Cooperative Learning
- Direct Learning

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	Explain basic healthcare economic concepts and financial models	Basics of Healthcare Economics	E-Learning Direct Learning	Homework
2	2+2	Apply budgeting principles in healthcare organizations	Budgeting and Financial Planning in Healthcare	E-Learning Direct Learning	Quiz
3	2+2	Analyze HR structure and staffing models in healthcare	Human Resources in Healthcare / Staffing Scheduling	E-Learning Direct Learning	Homework
4	2+2	Evaluate workforce planning strategies	Healthcare Workforce Management	E-Learning Direct Learning	Quiz
5	2+2	Identify components of Health Information Systems	Health Information Technology	E-Learning Direct Learning	Homework
6	2+2	Assess digital health and telemedicine applications	Telemedicine and Digital Health Innovations	E-Learning Direct Learning	Homework
7	2+2	Explain healthcare marketing and communication strategies	Marketing and Communication in Healthcare	E-Learning Direct Learning	Mid Exam
8	2+2	Demonstrate understanding of first half course content	First Test	E-Learning Direct Learning	Written Test
9	2+2	Analyze crisis communication strategies	Public Relations and Crisis Communication	E-Learning Direct Learning	Quiz
10	2+2	Explain public health administration principles	Public Health Administration / Population Health Management	E-Learning Direct Learning	Quiz
11	2+2	Design health promotion strategies	Health Promotion and Disease Prevention Programs	E-Learning Direct Learning	Quiz

12	2+2	Evaluate emerging trends in healthcare administration	Innovation and Future Trends in Healthcare Administration	E-Learning Direct Learning	Homework
13	2+2	Analyze value-based care frameworks	Value-Based Care Models	E-Learning Direct Learning	Homework
14	2+2	Assess global health system challenges	Global Health Challenges and Opportunities	E-Learning Direct Learning	Homework
15	2+2	Integrate and synthesize course knowledge	Second Test	E-Learning Direct Learning	Written Test

10. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<input type="checkbox"/> Buchbinder, S. B., & Shanks, N. H. – <i>Introduction to Health Care Management</i> , Jones & Bartlett Learning. <input type="checkbox"/> Shortell, S. M., & Kaluzny, A. D. – <i>Healthcare Management: Organization Design and Behavior</i> , Cengage Learning.
Main references (sources)	<ul style="list-style-type: none"> • Strategic Healthcare Management – Ginter, Duncan & Swayne • WHO Health System Framework Reports • World Bank Health System Publications • Ginter, P. M., Duncan, W. J., & Swayne, L. E. – <i>Strategic Management of Health Care Organizations</i>, Wiley. • Shi, L., & Singh, D. – <i>Delivering Health Care in America: A Systems Approach</i>, Jones & Bartlett Learning. • World Health Organization (WHO) – Health Systems Framework Reports. • World Bank – Health Systems Governance and Financing Publications.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name: Human-Computer Interactions	
1. Course Code: IMS422	
2. Semester / Year: 4 Semester 8/2025-2026	
3. Description Preparation Date: 3/2/2026	
4. Available Attendance Forms:	
5. Number of Credit Hours (Total) / Number of Units (Total)	
125 / 5	
6. Course administrator's name (mention all, if more than one name)	
Name: Dr. Atyaf Sami Noori Email: dr.atyaf.sami@uoitc.edu.iq	
7. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> To define the basics of interaction between human and computer. To understand the human side and how they interact with interfaces. To define the cognition. To explain how to design an interactive interface. To enable students to design an interactive system
8. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This be achieved through classes, interactive tutorials and by considering type of simple experim involving some sampling activities that are interesting to the students.
9. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	The students should be to: define the HCI, required software implement the homework and design the project	Introduction to course (Discussion of syllabus, What does HCI means, Software needed to implement the course home works and projects).	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 2	2	Upon completion of topic, students will be to: 1. Define Human-Comp Interaction and its terminologies. 2. Explain the roles of human, the computer, their interaction. 3. Describe the goals, challenges, importance of HCI system design.	Foundations(Common Terminologies in HCI, What is Human Computer Interaction, The Human The computer, interaction, Goals of HCI, Challenge of HCI, The Importance of HC).	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 3	2	Upon completion of topic, students will be to: 1. Define interaction design and explain its main goals. 2. Distinguish between good and bad interaction design using practical examples 3. Identify what should be designed explain the importance understanding users' needs.	Interaction Design (What interaction design?, Goals interaction design, Example of bad and good design, What to design, Understanding users' needs).	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 4	2	Upon completion of topic, students will be to: 1. Explain the Relationship between Interaction Design, HCI, and related fields. 2. Describe the application of interaction design healthcare and the roles	Interaction Design (Relationship between ID, HCI and other, fields, Interaction design healthcare, What do profession do in the ID healthcare?, Core characteristics of interaction design, Usability goals, Activity on usability, User experience goals, Design principles).	blended learning	Achievement Tests Oral presentation Project Individual Skills

		of professionals in this area. 3. Identify core characteristics interaction design, including usability and experience goals. 4. Apply basic design principles through usability-focused activities.			
Week 5	2	Upon completion of topic, students will be to: 1. Explain usability principles and apply analysis in interaction design. 2. Distinguish between different task analysis approaches and prototyping methods, including paper prototyping. 3. Design basic help documentation features based on the characteristics of an effective help system.	Interaction Design (Usability principles, Task Analysis, Approaches to task analysis, Differences from other techniques, Prototyping, Methods of prototyping, Paper prototyping, Help & Documentation, Features of an ideal help system).	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 6	2	Upon completion of topic, students will be to: 1. Explain the principles of user-centered design and their importance in interaction design. 2. Apply basic prototyping techniques to represent design ideas. 3. Evaluate prototypes based on usability and user needs.	User Centered Design Prototyping	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 7	2		Mid-term Exam	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 8	2	Upon completion of topic, students will be to: 1. Explain the principles of user-centered design and their importance in interaction design. 2. Apply basic prototyping techniques to represent design ideas.	User Centered Design Prototyping	blended learning	Achievement Tests Oral presentation Project Individual Skills

		3.Evaluate prototypes based on usability and user needs.			
Week 9	2	Upon completion of topic, students will be to: 1.Explain the basic principles of visual design in interactive systems. 2.Apply visual elements(color, typography, layout, icons) to create clear usable interfaces. 3.Evaluate visual designs based on usability and experience principles.	Visual design	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 10	2	Upon completion of topic, students will be to: 1.Explain key design rules in interface design. 2.Apply design rules create usable and user-friendly interfaces.	Design rules	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 11	2	Upon completion of topic, students will be to: 1.Explain the steps of the design process solving interaction design problems. 2.Apply the design process to develop solutions for specific user-centered problems.	Design Process for some proble	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 12	2	Upon completion of topic, students will be to: 1.Use Visual Studio to develop and run basic programs. 2.Debug and test programs within Visual Studio.	Programs by Visual studio	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 13	2	Upon completion of topic, students will be able to: 1.Applyproject development steps implement a	Development the Project	blended learning	Achievement Tests Oral presentation Project Individual Skills

		complete solution. 2. Test, debug, and evaluate the project ensure it meets requirements.			
Week 14	2	Upon completion of topic, students will be able to: 1. Explain different techniques for evaluating interactive systems. 2. Apply evaluation methods to assess usability and experience.	Evaluation techniques	blended learning	Achievement Tests Oral presentation Project Individual Skills
Week 15	2	Upon completion of topic, students will be able to: 1. Explain different techniques for evaluating interactive systems. 2. Apply evaluation methods to assess usability and experience.	Evaluation techniques (continue)	blended learning	Achievement Tests Oral presentation Project Individual Skills

10. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Alan Dix, et al (2004), Human-Computer Interaction, 3rd Edition, Prentice Hall. Julie A. Jacko and Andrew Sears (2003), "Handbook for Human-Computer Interaction. Mahwah: Lawrence Erlbaum & Associates, ISBN 0-8058-4468-6.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	1- http://www.hcibook.com/e3/ 2- http://www.microsoft.com/learning/booksurvey/ 3- http://www.msdn.microsoft.com/ar-sa/windows/

Course Description Form

Course Name: English IV	
1. Course Code: BMI221	
2. Semester / Year: 4 Semester 8/2025-2026	
3. Description Preparation Date:	
08/03/2026	
4. Available Attendance Forms:	
Attendance in the classroom	
5. Number of Credit Hours (Total) / Number of Units (Total)	
20 study hours	
6. Course administrator's name (mention all, if more than one name)	
Name: Mohammed Fareed Majeed	
Email: m.majeed@uoitc.edu.iq	
7. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • The aim is to strengthen students' education on using English as a foreign language to help them enrich their information and understanding of terms and phrases and strengthen their four skills (reading, writing, speaking and listening). • Introducing students to the rules, principles, concepts, vocabulary and meanings of the English language according to the prescribed curriculum.
8. Teaching and Learning Strategies	
Strategy	<ul style="list-style-type: none"> - Traditional teaching methods (lecture, discussion, viewing) and others, as well as the use of blended learning. - Modern teaching methods (brainstorming, skills outside the academic framework) Modern educational technology.
9. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	. The tense system . Informal language .Spoken English Compound words	Home and away	Lecture	Paper or/ and oral exam
2	2	. Present Perfect . Simple and .Continuous . Spoken English make and do.	Been there, done that !	Lecture, Discussion	Paper or/ and oral exam
3	2	. Narrative tenses . Spoken English . Talking about books and films	The kindness strangers	Discussion	Group Discussion
4	2	. Questions and negatives • How come?	A pack of lies	lecture	Paper or/ and oral exam
5	2	. Cognitive, emotional and skillful	Test	Test	Test
6	2	. Future forms . The use of thing . Common verbs – take and put	An eye to future	Discussion	Group Discussion
7	2	. Expressions of quantity	Making it big	Lecture Cooperative	Cooperative Education
8	2	Cognitive, emotional and skillful	Test	Test	Test
9	2	. Modals and related verbs . Common verbs – get	Getting together	Discussion	Cooperative education
10	2	. Relative clauses . Present and past participle . Adverbs	Going to extremes	Lecture	Participation
11	2	. Expressing habit . Homonyms and homophones	Things ain't what they used to be!	Lecture	Group Discussion
12	2	Cognitive, emotional and skillful	Test	Test	Test
13	2	. Modal auxiliary			Group Discussion

		verbs 2 • Synonyms • Metaphors and idioms - the body	Risking life and limb	Discussion	
14	2	. Hypothesizing . Expressions with if	Assumption	Lecture	Participation
15	2	. Articles and determiners . Expressions with and time	About time!	Discussion	Cooperative education

10. Course Evaluation

- 1- A form that performs according to a standard that depends on the nature of the scientific material
- 2- Works within group work.
- 3- Tests (written and oral)
- 4- General and transferable qualification skills (other skills related to employability and personal development).
- 5- Training students to use modern teaching methods and approaches, including blended learning using multimedia technology.
- 6- Assigning students to conduct research related to all areas of the English language
- 7- Enabling students to use their personal skills

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> • New-headway-plus-upper- intermediate-students-book. •New-headway-plus-upperintermediate-students-workbook
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	