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: 1/10/2024

File Completion Date: 1/12/2024

Signature:	**Signature**:
Head of Department Name:	**Scientific Associate Name**:
Date:	**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 2024–2025 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
2025-2024/ first/1	IMS111	Logic Design I	3	2	2
2025-2024/ first/1	BMI111	Mathematics I	3	2	2
2025-2024/ first/1	IMS112	Introduction to Medical Informatics	3	2	2
2025-2024/ first/1	BMI117	Biology	4	2	3
2025-2024/ first/1	BMI113	Computer programming I	3	2	2

2025-2024/ first/1	BMI115	Computer fundamentals	2	-	2
2025-2024/ first/1	HUR111	Human Rights	1	-	1
2025-2024/ first/2	IMS122	Logic Design II	3	2	2
2025-2024/ first/2	BMI122	Mathematics II	3	2	2
2025-2024/ first/2	IMS122	Bioinformatics	3	2	2
2025-2024/ first/2	IMS123	Medical Terminology	2	-	2
2025-2024/ first/2	BMI124	Computer Programming II	3	2	2
2025-2024/ first/2	DAF121	Democracy and Freedom	1	-	1
2025-2024/ first/2	ENG121	English I	2	-	2
2025-2024/ first/2	ARB121	Arabic	2	-	2
2025-2024/ second/1	IMS215	General Anatomy and Physiology	3	2	2
2025-2024/ second/1	IMS212	Biochemistry	3	2	2
2025-2024/ second/1	BMI122	Discrete Mathematics	2	-	2
2025-2024/ second/1	BMI211	Data structures	3	2	2
2025-2024/ second/1	IMS211	Object Oriented Programming I	3	2	2
2025-2024/ second/1	IMS213	Computer Networking	3	2	2
2025-2024/ second/1	IMS214	Microprocessors	3	2	2
2025-2024/ second/1	ETH211	Ethics	2	-	2
2025-2024/ second/2	IMS226	Human Disease for the Health Professions	3	2	2
2025-2024/ second/2	IMS225	Molecular biology	3	2	2
2025-2024/ second/2	BMI221	Statistics & Probability	3	2	2
2025-2024/ second/2	IMS224	Data Acquisition for Medical Applications	3	2	2
2025-2024/ second/2	IMS222	Object Oriented Programming II	3	2	2
2025-2024/ second/2	IMS221	Database Systems in Healthcare	3	2	2
2025-2024/ second/2	IMS223	Operating Systems	2	-	2
2025-2024/ second/2	ENG222	English II	2	-	2
2025-2024/Third/1	IMS312	Embedded systems	3	2	2

2025-2024/Third/1	BMI311	Artificial Intelligence I	3	2	2
2025-2024/Third/1	IMS311	Applications Development I	3	2	2
2025-2024/Third/1	IMS313	Web Programming I	3	2	2
2025-2024/Third/1	IMS314	Digital Signal Processing	3	2	2
2025-2024/Third/1	IMS315	Geographical Information Systems (GIS) for Health Care	3	2	2
2025-2024/Third/1	IMS316	Software Engineering	3	2	2
2025-2024/Third/2	IMS321	Wireless body sensor networks	3	2	2
2025-2024/Third/2	BMI322	Artificial Intelligence II	3	2	2
2025-2024/Third/2	IMS322	Applications Development II	3	2	2
2025-2024/Third/2	IMS324	Web Programming II	3	2	2
2025-2024/Third/2	BMI321	Medical Image Processing	3	2	2
2025-2024/Third/2	IMS325	Computer Network Protocols	3	2	2
2025-2024/Third/2	ENG323	English III	2	-	2
2025-2024/Fourth/1	BMI411	Cloud Computing	3	2	2
2025-2024/Fourth/1	IMS412	Deep learning	3	2	2
2025-2024/Fourth/1	IMS413	Health Care Systems Administration I	2	-	2
2025-2024/Fourth/1	IMS414	Clinical Data Mining	3	2	2
2025-2024/Fourth/1	IMS415	Simulation and Modeling in Medicine Applications	3	2	2
2025-2024/Fourth/1	IMS416	Big Data Analysis in Health Care	3	2	2
2025-2024/Fourth/1	BMI410	Final Project I	3	2	2
2025-2024/Fourth/2	IMS421	Electronic Health Records	2	2	3
2025-2024/Fourth/2	IMS422	Human Computer Interaction in Health Care	-	2	2

2025-2024/Fourth/2	IMS425	Information Security in Healthcare	2	2	3
2025-2024/Fourth/2	IMS424	Health Care Systems Administration II	2	2	3
2025-2024/Fourth/2	IMS426	Medical Multimedia	2	2	3
2025-2024/Fourth/2	ENE424	English IV	-	2	2
2025-2024/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	AcademiTitle
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

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 (2024–2025)

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 (2024–2025)

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)	*Pending mapping*	√	√	√	√	√	√	√	√	√

□ Program Skills Outline – Third Level / Second Semester (2024–2025)

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 (2024–2025)

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)	√		√	√	√				√	√
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 (2024–2025)

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: 2024–2025
Level 3 – Semester 1

No.	Subject Code	Subject Name	Type	Theory Hours	Title(s)	Instructor Name	Practical Hours	Units
1	IMS312	Embedded Systems	Compulsory	2	Lecturer Dr.	Atyaf Sami	2	3
2	BMI311	Artificial Intelligence I	Compulsory	2	Associate Professor Dr.	Sanaa Ahmed	2	3
3	IMS311	Applications Development I	Compulsory	2	Associate Professor Dr	Mazin Haitham	2	3
4	IMS313	Web Programming I	Basic	2	Associate Professor Dr.	Imad Qasim	2	3
5	IMS314	Digital Signal Processing	Compulsory	2	Lecturer	Nada Subeih	2	3
6	IMS315	GIS for Health Care	Compulsory	2	Lecturer Dr.	Mazin Hussein	2	3
7	IMS316	Software Engineering	Basic	2	Lecturer Dr.	Ahmed Majid	2	3

□ Intelligent Medical Systems (IMS) Department

Academic Year: 2024–2025
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.	Muneera Abdul Hamdi	2	3
3	IMS322	Applications Development II	Compulsory	2	Associate Professor Dr.	Mazin Haitham	2	3
4	IMS324	Web Programming II	Basic	2	Associate Professor Dr.	Imad Qasim Habeeb	2	3
5	BMI321	Medical Image Processing	Compulsory	2	Lecturer Dr.	Ansam Ali Abdulhussein	2	3
6	IMS325	Computer Network Protocols	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: 2024–2025
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	Osama Sameer	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	Lecturer	Jowan Kanaan	2	3

No.	Subject Code	Subject Name	Type	Theory Hours	Title(s)	Instructor Name	Practical Hours	Units
5	IMS415	Simulation and Modeling in Medicine Applications	Elective	2	Lecturer Dr.	Hussein Mohammed Reda	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: 2024–2025
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
2	IMS422	Human-Computer Interaction in Health Care	Compulsory	2	Lecturer Dr.	Atyaf Sami	2	3
3	IMS425	Information Security in Healthcare	Compulsory	2	Associate Professor Dr.	Sanaa Ahmed	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

Courses Description Forms

Course Name: **Health Care Systems Administration I**

1. Course Code: IMS413

2. Semester / Year: **Semester 1/2024-2025**

3. Description Preparation Date: **15/9/2024**

4. Available Attendance Forms: **Theoretical**/ Class Attendance Register

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

   30/2

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	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: • 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	- Blended-Learning - Self-Learning - Learning by Experimentation - Brainstorming

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	P1, A1	erview of Healthcare Systems Administration	Achievement Tests al presentation oject Individual Skills	nded learning
2nd	2	P2, B3	Health Care System: Structure, Key Divisions, Insurance Plans and Key Industries	hievement Tests al presentation oject Individual Skills	nded learning
3rd	2	P1, P2, A1	Comprehensive Overview of Health Care Delivery and Reform	hievement Tests al presentation oject Individual Skills	nded learning
4th	2	P4, P6, A4	Healthcare Safety Net, Quality, Efficiency, and Global Data Insights	hievement Tests al presentation oject Individual Skills	nded learning
5th	2	P5, P6, A3	Key Legal and egulatory Aspects of althcare Compliance and Protection	Achievement Tests al presentation oject Individual Skills	nded learning
6th	2	P3, P10, A2, C2	Key Ethical Considerations in Medical Practice and Decision Making	hievement Tests al presentation oject Individual Skills	nded learning
7th	2	P8, C1	Overview and Challenges of the National Iraqi Healthcare System	hievement Tests al presentation oject Individual Skills	nded learning
8th	2	P4, A4	Standard Tests1	Standard Tests1	nded learning

9th	2	Course-Level Outcomes P1, P2, P4, P5, P3, P10, P8, P6 Program-Learning Outcomes: A1, A2,A3, A4,B3,C1, C2	Healthcare Policy, egulation, Financing, and Reimbursement	hievement Tests al presentation oject Individual Skills	nded learning
10th	2	P6, P7, A1, B1	Leadership and Management in Population Health	hievement Tests al presentation oject Individual Skills	nded learning
11th	2	P2, P6, B3	Enhancing Healthcare through Marketing, Communications, and Quality Improvement	hievement Tests al presentation oject Individual Skills	nded learning
12th	2	P5, P11, B2	2Standard Tests	Standard Tests2	nded learning
13th	2	Course- Level Oucomes: P2, P5, P6, P7, P11 Program-Level Outcomes: A1, B1, B2, B3	Advancing Healthcare through Quality mprovement, Supply Chain Management, and Workforce Development	hievement Tests al presentation oject Individual Skills	nded learning
14th	2	P7, P9, B1	Innovations in Telehealth, Ethics, Law, and Emergency Preparedness in Healthcare	hievement Tests al presentation oject Individual Skills	nded learning
15th	2	P8, A3, C1, C2	Advancing Patient-Centric and Economically ustainable Integrated Healthcare Solutions	hievement Tests al presentation oject Individual Skills	nded 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)	• Michael Nowicki, EdD, FACHE, FHFMA. Introduction to the Financial Management of Healthcare Organizations, Sixth Edition, 2014. Peter C. Olden, PhD, LFACHE Cathleen O. Erv PhD, Management of Healthcare Organizatic An Introduction, Fourth Edition, 2024.
Main references (sources)	Patrice L. Spath, Introduction to Healthc 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

Topic Sequence	Supports Learning Outcomes
	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 Name: **Electronic Health Records**

12. Course Code: **IMS421**

13. Semester / Year: **Semester 2/2024-2025**

14. Description Preparation Date: **18/2/2025**

15. Available Attendance Forms: **Theoretical and practical** / Class Attendance Register

16. Number of Credit Hours (Total) / Number of Units (Total)

60/4

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

Name: Zainab N. Al-qudsy
Email: dr.zainab.n.yousif@uoitc.edu.iq

18. Course Objectives

Course Objectives	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: • 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 Advanced experience in dealing with complex SQL expressions

19. Teaching and Learning Strategies

Strategy	- Blended-Learning - Self-Learning - Learning by Experimentation

	- Brainstorming

20. 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 → A B1, B2	Achievement Tests Oral presentation Project Individual Skills	blended learning
5	4	Key Terminology & Primary	P2, P3, P6 → A2,	In Achievement Tests Oral presentation	blended learning

		Keys in Tables		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 Tests1	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,	Achievement Tests Oral presentation Project	blended learning

				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

21.Course Evaluation

		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	10
Final	Total	Theory				Practical			
	50	50				-			
Total	100								

22.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	• Carter, J.H. .*Electronic health record: A guide for clinicians and administrators.*Philadelphia: ACP Press. (ISBN 1930513976 9781930513976 *Practice Management and EHR: A To Patient Encounter for Medisoft Clini FirstEdition, Susan M. Sanderson*
Main references (sources)	• 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

E**lectronic 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 Syllabus / Specification

Course Specification

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

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.

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

(Already completed in previous response)

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11. Course Structure

Week	Hours	Unit/Module or Topic Title	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	2	Digital Signal Processing	Signals – Definition, Types, Classification	Direct	Direct questions
2	2	Operations on Signals	Shifting, Scaling, Reversal, Convolution	Direct	Direct questions

Week	Hours	Unit/Module or Topic Title	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
3	2	Computer Vision and Image Processing	Imaging Systems, Vision, Enhancement, Compression	Direct	Direct questions
4	2	Mathematical Representation of the Image	Image Types, Thresholding, Domains	Direct	Direct questions
5	2	Linear Algebra and Image Processing	Connection to DIP, Examples	Direct	Direct questions
6	3	Matrix Decomposition Methods in DIP	SVD, QR, LU, Applications	Direct	Direct questions
7	–	First Test	–	–	Written exam
8	2	Image Analysis	Features, Preprocessing, ROI, Convolution	Direct	Direct questions
9	2	Image Algebraic Operations and Noises	Arithmetic, Logic, Noise Types, Filters	Direct	Direct questions
10	2	Calculus and Image Processing – Discrete Transformation	DFT, DWT, DCT, Filtering	Direct	Direct questions
11	2	Edge Line Detection	Definitions, Methods	Direct	Direct questions
12	2	Histogram and Features	Histogram Equalization, Statistical Measures	Direct	Direct questions
13	2	Image Compression A & B	Compression Models, Lossless Methods	Direct	Direct questions
14	–	Second Test	–	–	Written exam
15	–	Panel Discussion	Review of Key Topics	Discussion	Participation

12. Infrastructure

I. Textbooks:

1. *Digital Signal Processing Tutorial*
2. TutorialsPoint – DSP
3. *Computer Vision and Image Processing*, Scott E. Umbaugh
4. *Digital Image Processing*, Kenneth R. Castelman
5. *Digital Image Processing*, Rafael C. Gonzalez & Richard E. Woods
6. *Digital Image Processing*, Rafael Gonzalez & Paul Wintz
7. *Fundamentals of Digital Image Processing*, Anil K. Jain
8. Mohamed Allali (2010), *Linear Algebra and Image Processing*, IJMEST
9. Klein Project Blog
10. Rowayda A. Sadek, *SVD Based Image Processing Applications*
11. Lijie Cao, *SVD Applied to DIP*, Arizona State University

12. HIPR2 – Image Processing
13. SlidePlayer
14. Ritsumeikan University – IAML

II. References:

- As listed above.

III. Recommended Reading:

- Scientific journals, technical reports, and conference papers related to digital image processing and signal analysis.

IV. E-References / Websites:

- Included in textbook list and additional online platforms.

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13. Course Development Plan

- Incorporate the latest developments in digital signal and image processing by reviewing current scientific periodicals.
- Update teaching methods and integrate modern scientific tools and techniques.
- Encourage innovation and research-based learning through practical applications and project-based assessments.

📘 Course Syllabus / Specification

Item	Details
1. Teaching Institution	University of Information Technology & Communications
2. Department / Center	Intelligent Medical Systems
3. Course Title / Code	Embedded System
4. Modes of Attendance Offered	Full Time
5. Semester / Year	Semester 1 / 2024–2025
6. Number of Hours Tuition (Total)	60 hours
7. Date of Production of this Specification	15/9/2024

Item	Details
8. Course Description	This course introduces the fundamental concepts of Embedded Systems. Topics include: Introduction to computer systems, components and characteristics of embedded systems, microcontrollers, and applications of embedded systems.

9. Aims of the Course

1. Illustrate the foundations of Embedded Systems.
2. Explain the fundamental concepts of Embedded System structure, Microprocessor & Microcontroller.
3. Implement programming using Arduino.

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

- Analyze components of Embedded Systems.
- Distinguish between Microprocessor & Microcontroller.
- Write and implement Arduino programs.
- Understand embedded system mechanisms and applications.
- Understand types of memory.

Teaching Methods:

- E-Learning
- Direct Learning
- Self-Learning

Assessment Methods:

- Achievement Tests
- Intellectual Questions
- Project-Based Performance
- Reports, Seminars, Presentations

B. Subject-Specific Skills

- Use Arduino tools and techniques in projects.
- Apply theoretical principles in practical implementation.

Teaching Methods:

- E-Learning
- Direct Learning

- Learning by Experimentation

Assessment Methods:

- Achievement Tests
- Intellectual Questions
- Performance Assessment

C. Critical Thinking Skills

- Function effectively in teams.
- Communicate with diverse audiences.
- Assist in project planning.

Teaching Methods:

- Cooperative Learning
- Indirect Learning

Assessment Methods:

- Collective Projects

D. General and Transferable Skills

- Communicate across disciplines.
- Solve problems.
- Collaborate effectively in work environments.

Teaching Methods:

- E-Learning
- Self-Learning

Assessment Methods:

- Performance Assessment
- Group Projects
- Randomized Student Teams

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11. Course Structure

Week	Hours	Unit/Module Title	ILOs	Teaching Method	Assessment Method
1	4	Introduction to Embedded Systems	Understand embedded systems	E-Learning, Direct	Performance Assessment
2	4	Microcontroller (8051)	Understand microcontroller basics	E-Learning, Direct	Performance Assessment
3	4	Microcontroller Architecture	Compare Microcontroller vs Microprocessor	E-Learning, Direct	Performance Assessment
4	4	Components of Embedded Systems	Understand system components	E-Learning, Direct	Performance Assessment
5	4	Hardware Components	Understand embedded system structure	E-Learning, Direct	Performance Assessment
6	4	Processor Types	Understand processor architectures	E-Learning, Direct	Performance Assessment
7	4	Storage & Communication	Understand communication types	E-Learning, Direct, Self-Learning	Achievement Tests
8	4	First Test	Individual assessment	Self-Learning	Achievement Tests
9	4	Modulator (PWM), LCD, Motors	Understand theoretical applications	E-Learning, Direct, Experimentation	Achievement Tests
10	4	Embedded System Constraints	Classify processor types	E-Learning, Direct, Experimentation	Performance Assessment
11	4	IC Technology	Understand design challenges	E-Learning, Direct, Experimentation	Performance Assessment
12	4	Memory in Embedded Systems	Understand memory technologies	E-Learning, Direct, Experimentation	Performance Assessment
13	4	Memory Types (RAM/ROM)	Compare memory types	E-Learning, Direct, Experimentation	Performance Assessment
14	4	Advanced Memory Types	Understand DRAM, SRAM, Cache	E-Learning, Direct, Experimentation	Performance Assessment
15	4	Second Test	Individual assessment	Self-Learning	Achievement Tests

12. Infrastructure

I. Textbooks:

- *Embedded Systems Design*, N. Suresh, Assistant Professor, ECE Dept
- *Embedded Systems – Architecture, Programming and Design*, Raj Kamal, McGraw-Hill Education
- *Memory Organisation, Types of Memory*

II. References:

- N/A

III. Recommended Reading:

- Periodicals, technical reports, and publications related to embedded systems (to be added as needed)

IV. E-References / Websites:

- [To be added based on course resources]

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13. Assessments

Type of Assessment	Description	Weighting	Theory	Practical
Course Work	T.1, T.2, Ass1, Ass2, Attendance	50%	14 + 14 + 2 + 2 + 1 = **33**	6 + 6 + 4 + 1 = **17**
Final Exam	Theory & Practical	50%	50	–
Total	–	**100%**	**83**	**17**

T.1 = Test 1, T.2 = Test 2, Ass = Assignment, Atten = Attendance

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14. Course Development Plan

- N/A

📘 Course Syllabus / Specification

📘 Course Syllabus / Specification – Geographical Information Systems (GIS) for Health Care

Item	Details
Course Title	GIS for Public Health
Course Code	IMS315
Level of Course	Undergraduate
Level – Semester	Level 3 – Semester 1 / 2024–2025
Theoretical Hours (per week)	2
Practical Hours (per week)	2

Item	Details
Total Units	3
Date of Production	1/10/2024
Lecturer's Name	Dr. Mazin H. Abdullah
Course Description	This course introduces the power of Geographic Information Systems (GIS) in analyzing spatial health and medical data. Topics include GIS organization, clustering detection, spatial statistics, and visualization techniques.
Course Objectives	1. Understand medical and health geography and its relation to public health. 2. Apply statistical and computational methods to health geography. 3. Produce professional maps for health and medical topics.
Prerequisite Courses	None
Co-requisite Courses	None
Incompatible Courses	None
Complementary Courses	None
Course Grading	**Course Work:** 50% (Theory 30%, Practical 20%) **Final Exam:** 50% **Total:** 100%

🗓 Weekly Schedule

Week	Topics Covered	Lab Activities
1	Overview of Course and Introduction to GIS	GIS MATLAB Introduction
2	Map Anatomy, Types, Scales, Projections	GIS Tool in MATLAB
3–4	GIS and Spatial Data, SDI, DBMS	GIS Tool in MATLAB
5	Spatial Databases for Public Health	Introduction to ARCMap Software
6	Data Models for GIS (Raster & Vector)	ARCMap Tools Analysis
7	**Exam 1**	–
8–9	Data Entry, Quality, Risk Modeling	ARCMap Tools Analysis
10	Visualizing Spatial Data, Map Types	ARCMap Tools Analysis
11–12	Analyzing Public Health Data, Overlays	ARCMap Implementation
13	Mathematical Modeling, Disease Diffusion	ARCMap Implementation
14	Course Review	–
15	**Exam 2**	Test 2

📚 Course References

Type	Details
Main References	- *Applied Spatial Statistics for Public Health Data*, Lance A. Waller & Carol A. Gotway (2004) - *GIS and Public Health*, Ellen K. Cromley & Sara L. McLafferty (2011) - *Geographic Information Systems*, Version 1.0
Recommended Reading	[To be added]
E-References / Websites	[To be added]

Course References

- *Applied Spatial Statistics for Public Health Data*, Lance A. Waller & Carol A. Gotway, 2004
- *GIS and Public Health*, Ellen K. Cromley & Sara L. McLafferty, 2nd Edition, 2011
- *Geographic Information Systems*, Version 1.0

📓 Course Specification – Mobile Application Development

Course Structure

Week	Date	Hours	Theory Topic	Practical Topic	Teaching Method	Assessment Method
1	16-09-2024	4	Introduction to Android platform	Application types	Blended Learning	Achievement Tests, Oral Presentation, Project, Skills
2	23-09-2024	4	App lifecycle in Android	Development tools & languages	Blended Learning	Same as above
3	01-10-2024	4	GUI: containers, layout, events	Install development tools	Blended Learning	Same as above
4	08-10-2024	4	App resources, content providers	Install simulator	Blended Learning	Same as above
5	15-10-2024	4	Data persistence	Install Flutter with example	Blended Learning	Same as above
6	22-10-2024	4	App security & permissions	I/O statement implementation	Blended Learning	Same as above

Week	Date	Hours	Theory Topic	Practical Topic	Teaching Method	Assessment Method
7	29-10-2024	4	Midterm Exam	Implementation exam	Blended Learning	Exam
8	05-11-2024	4	Standard Test 1	–	–	Exam
9	12-11-2024	4	Multimedia, graphics	Assign statement implementation	Blended Learning	Same as above
10	19-11-2024	4	Simple game programming	Condition statement implementation	Blended Learning	Same as above
11	26-11-2024	4	GPS integration	Game implementation	Blended Learning	Same as above
12	03-12-2024	4	Bluetooth communication	Loops	Blended Learning	Standard Test 2
13	10-12-2024	4	App deployment	Loop & condition implementation	Blended Learning	Same as above
14	12-12-2024	4	Project discussion	Simple project implementation	Blended Learning	Same as above
15	19-12-2024	4	Final Exam	Group project discussion	Blended Learning	Final Exam

Assessment Methods

Type of Assessment	Description	Weighting	Theory	Practical
Course Work	T.1, T.2, Seminar, Attendance & Quizzes	50%	15 + 15 + 10 + 10 = **50**	–
Final Exam	Theory & Practical	50%	50	–
Total	–	**100%**	–	

Learning Activities

Axis	Description
Readings	Weekly readings are required for class discussion. Optional readings offer deeper exploration and support for presentations.

Axis	Description
Discussion	Weekly discussions based on readings and assignments. Active participation is essential.
Oral Presentations	Each student prepares a 10-slide presentation on a unit-related topic, using scientific sources and multimedia. Presentations are shared via Google Classroom and include peer Q&A.

Subject-Specific Skills

Skills
Describe concepts and theories of app development
Use tools and technologies effectively
Interpret laws and ethics in development
Explore development approaches and policy implementation
Evaluate performance and quality
Advocate for ethical and efficient development practices

Teaching Methods:

- Blended Learning
- Experimentation
- Brainstorming
- Indirect Learning

Assessment Methods:

- Achievement Tests
- Oral Presentations
- Projects
- Standard Tests
- Individual Skills Assessment

Critical Thinking Skills

Skills
Lifelong learning motivation
Analyze and solve complex problems

Teaching Methods:

- Self-Learning
- Experimentation
- Cooperative Learning
- Indirect Learning

Assessment Methods:

- Achievement Tests
- Oral Presentations
- Projects
- Standard Tests
- Individual Skills Assessment
- Intellectual Questions in Tests

General and Transferable Skills

Skills

Lifelong learning adoption

Cross-disciplinary communication

Problem-solving

Workplace communication

Teaching Methods:

- Self-Learning
- Experimentation
- Cooperative Learning
- Indirect Learning

Assessment Methods:

- Individual Skills Assessment
- Intellectual Questions in Tests

Infrastructure

Type	Details
Textbooks	"Launching Your App on Devices", Developer.apple.com
References	Foley, Mary Jo (10 May 2017)
Recommended Reading	- Toptal - Medium
E-References	[To be added]

Course Development Plan

- Expand the course by adding topics related to mobile app analysis and development capabilities.

📓 Course Specification –Software Engineering

1. Educational Institution

University of Information Technology and Communications

2. Academic Department / Center

College of Biomedical Informatics

3. Course Name / Code

Software Engineering

4. Available Attendance Modes

Modes of Attendance Offered : Internal: Requires on campus attendance

5. Semester / Academic Year

First Semester

6. Total Credit Hours

16 hours (2 theoretical)

7. Date of Description Preparation

2025

8. Course Objectives

The course supports careers in the software industry, including managing software companies and optimizing the use of human and material resources.

🎯 Learning Outcomes, Teaching Methods, and Assessment

A. Cognitive Objectives

- A1: Teach students the fundamentals of software engineering
- A2: Teach students how to prepare a scheduled work plan for software projects
- A5: —
- A6: —

B. Skills-Based Objectives

- B1: Enable students to create specific project timelines
- B2: Enable students to select a scientific and methodological work model
- B3: Enable students to estimate project costs
- B4: Enable students to develop and evaluate project plans before and after delivery

Teaching Methods:
Whiteboard and TV screen explanations, enabling program execution and interactive, engaging instruction

Assessment Methods:
Daily and semester exams, lab discussions, and correction of daily assignments via online classrooms

C. Affective and Value-Based Objectives

- C1: Prepare qualified personnel capable of managing institutions in the software industry

Teaching Methods:
Forming student teams to prepare presentations on course material, using classical lecture methods, summarizing key points on the board, and presenting via data show

Assessment Methods:
Quick quizzes, monthly exams, and evaluation of student group presentations

D. General and Transferable Skills (Employability and Personal Development)

- D1: Organize student discussion sessions to build self-confidence
- D2: Prepare for semester exams by sharing previous exam questions on Google Classroom

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□ Course Structure

Week	Hours	Learning Outcomes	Unit / Topic	Teaching Method	Assessment Method
1	2	—	Introduction to Software Engineering	Whiteboard, TV screen, online classroom	Daily/semester exams, lab discussions, program execution, homework
2	2	—	Software Goals and Products	—	—
3	2	—	Software Process Models_1	—	—
4	2	—	Software Process Models_2	—	—

Week	Hours	Learning Outcomes	Unit / Topic	Teaching Method	Assessment Method
5	2	—	Requirement Engineering Process	—	—
6	2	—	Requirements Engineering Activities	—	—
7	2	—	Feasibility Studies	—	—
8	2	—	Requirement Elicitation Techniques	—	—
9	2	—	Principles of Software Design & Concepts in Software Engineering	—	—
10	2	—	Types of Design Patterns	—	—
11	2	—	Developing a Design Model	—	—
12	2	—	Software Implementation and Management Process	—	—
13	2	—	What is a Software Management Process?	—	—
14	2	—	Project Management Concepts	—	—
15	2	—	Team Organizational Paradigms	—	—
16	2	—	Exam	—	—

🕮 Infrastructure

1. Required Textbooks

1. *Software Engineering: A Practitioner's Approach*, Roger Pressman, 2019

2. Main References

2. *Software Engineering: A Practitioner's Approach*, Roger Pressman, 2019
3. *Patterns of Enterprise Application Architecture*, Martin Fowler, 2002

A. Recommended Books and References

Scientific journals, reports, etc.

B. Electronic References and Websites

—

🛠 Course Development Plan

Incorporate the latest updates in the field by following the most recent scientific journals.

📃 Course Syllabus / Specification **AI 1**

1. Teaching Institution

University of Information Technology and Communications

2. Department / Center

Intelligent Medical Systems

3. Course Title / Code

AI 1

4. Modes of Attendance Offered

Direct

5. Semester / Year

First Semester / Academic Year 2024–2025

6. Number of Hours Tuition (Total)

60 Hours (Theoretical and Practical)

7. Date of Production of this Specification

7 / 10 / 2024

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8. Course Description

This syllabus provides a structured approach to introducing students to knowledge representation, propositional logic, various types of search algorithms, and an introduction to machine learning, with ample opportunities for hands-on projects and practical applications.

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9. Aims of the Course

- Understand and work with AI applications and search engines

- Build AI applications
- Develop machine learning applications
- Create knowledge representation (KR) systems

---

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

ILOs:

1. Ability to effectively integrate AI solutions
2. Build front-end interfaces
3. Develop applications for search and prediction
4. Construct machine learning algorithms

Teaching Methods:

- E-Learning
- Self-Learning
- Learning by Experimentation

B. Subject-Specific Skills

ILOs:

1. Understand processes that support representation and searching of knowledge within specific application environments

Teaching Methods:

- E-Learning
- Cooperative Learning

Assessment Methods:

- Collective Project

C. Critical Thinking Skills

ILOs:

1. Function effectively in teams to accomplish shared goals
2. Communicate effectively with diverse audiences

Teaching Methods:

- Collective Project
- Learning by Experimentation
- Indirect Learning

Assessment Methods:

- Student Performance Assessment

D. General and Transferable Skills

ILOs:

1. Communicate effectively with colleagues in a work environment
2. Problem-solving skills

Teaching Methods:

- E-Learning
- Self-Learning
- Learning by Experimentation

Assessment Methods:

- Collective Project
- Standard Test

---

11. Course Structure

Week	Hours	Unit / Topic Title	Intended Learning Outcomes	Teaching Method	Assessment Method
1	2+2	Introduction to AI, AI Problems, Intelligent Task Requirements	Introduction to AI	Direct	Direct Questions
2	2+2	AI Applications, Problem Solving, Graph and Tree	Serving the Field of AI	Direct	Direct Questions
3	2+2	Knowledge Representation (Production Rules Systems)	Knowledge Representation	Direct	Direct Questions
4	2+2	Logic Representation (Propositional & Predicate Logic)	Knowledge Representation	Direct	Direct Questions
5	2+2	Clause Form Conversion Algorithm	Knowledge Representation	Direct	Direct Questions
6	2+2	State Space Search (TSP, 8-Puzzle, Water Jug Problem)	Problem Solving	Direct	Direct Questions

Week	Hours	Unit / Topic Title	Intended Learning Outcomes	Teaching Method	Assessment Method
7	—	—	—	—	First Exam
8	2+2	Blind Search Algorithms (DFS, BFS)	Search Algorithms	Direct	Direct Questions
9	2+2	Advantages and Disadvantages of Search Algorithms	Search Algorithms	Direct	Direct Questions
10	2+2	Heuristic Search (Hill Climbing, Best First Search)	Search Algorithms	Direct	Direct Questions
11	2+2	A* Algorithm and Service Components	Search Algorithms	Direct	Direct Questions
12	2+2	Heuristic Function Properties	Search Algorithms	Direct	Direct Questions
13	2+2	Introduction to Machine Learning	ML Types and Applications	Direct	Direct Questions
14	—	—	—	—	Second Exam
15	2+2	AI Applications and Presentations	Projects	Direct	Presentation

12. Infrastructure

I. Textbooks

- Stuart Russell & Peter Norvig, *Artificial Intelligence: A Modern Approach*, 6th Edition, Prentice-Hall, 2010

II. References

- George F. Luger, *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*, 7th Edition, Addison Wesley, 2010

III. Recommended Reading

- Ivan Bratko, *Prolog Programming for Artificial Intelligence*, 4th Edition, Pearson Education, 2011
- Elsevier Journal of Artificial Intelligence
- Download Internet PDF Ebooks

📓 **Course Specification-** Web Programming I

1. Teaching Institution

College of Biomedical Informatics

2. Department / Center

Web Programming I

3. Course Title / Code

Web Programming I / [Insert Course Code]

4. Modes of Attendance Offered

Full-Time

5. Semester / Year

Semester 1 / Academic Year 2024–2025

6. Number of Hours Tuition (Total)

60 Hours

7. Date of Production of this Specification

16 / 10 / 2024

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8. Course Description

This course fully covers the fundamentals of modern web programming. A variety of essential topics will be introduced to prepare students for real-world applications. The course emphasizes both the theoretical foundations and practical skills needed to design, develop, and debug interactive web pages using HTML and JavaScript.

---

9. Aims of the Course

Students successfully completing this course should be able to:

- Learn HTML tags and JavaScript programming concepts and techniques
- Develop the ability to logically plan and structure web pages
- Write, test, and debug web pages using HTML and JavaScript

C. Critical Thinking Skills

Code	Intended Learning Outcome
C1	Analyze sets of Web Programming critically to generate useful insights and inform decision-making
C2	Identify technological requirements, architecture, and infrastructure needed to build Web Programming and address risk-related issues
C3	Identify new areas and ways to apply and communicate results of Web Programming analytics creatively to support insights and address emerging business challenges

Teaching and Learning Methods

- E-Learning
- Learning by Experimentation
- Cooperative Learning

Assessment Methods

- Standard Tests
- Individual Skills Assessment
- Student Performance Assessment

D. General and Transferable Skills

Code	Intended Learning Outcome
D1	Ability to adopt lifelong learning
D2	Ability to communicate information across specializations
D3	Ability to solve problems
D4	Ability to communicate effectively with colleagues in a work environment

Teaching and Learning Methods

- Self-Learning
- Cooperative Learning
- Brainstorming
- Indirect Learning

Assessment Methods

- Achievement Tests
- Standard Tests
- Individual Skills Assessment
- Selection of Intellectual Questions in Achievement Tests

Thanks! Here's your **Course Structure** for *Web Programming I*, formatted into a clear and professional weekly breakdown table:

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11. 🧮 Course Structure

Week	Hours (T+P)	Unit / Module Title	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	2 + 2	Introduction to Web Programming	A1, C1	Lecture / Lab	a, c, e, h
2	2 + 2	Basic HTML	A1, B1, B2, C1, C2	Lecture / Lab	c, e, h, d
3	2 + 2	Basic CSS	A1, A3, C1, C2, D4	Lecture / Lab	c, e, h, f
4	2 + 2	Basic JavaScript	A1, B1, B2, C2, D3	Lecture / Lab	a, c, e, h, i
5	2 + 2	HTML Tags & Elements	A1, B1, B2, C1, D1	Lecture / Lab	b, c, e, h
6	2 + 2	Page Layout	A1, B2, B3, D1, D3	Lecture / Lab	a, b, h, g
7	2 + 2	Mid Exam	—	Exam	a, b
8	2 + 2	Using Images	A1, B2, B3, C1, D1	Lecture / Lab	a, c, e, h, i
9	2 + 2	Using Tables	A1, B2, B3, C1	Lecture / Lab	b, c, e, h
10	2 + 2	Using Lists	A1, B1, C1, D1	Lecture / Lab	c, e, h, i
11	2 + 2	Using Frames	A1, B1, B2, C2	Lecture / Lab	a, c, e, h
12	2 + 2	Using Forms	B1, B2, C2, C3	Lecture / Lab	b, c, e, h, i
13	2 + 2	File Upload and Download	A1, B1, B2, C1, C2	Lecture / Lab	b, c, e, h, g
14	2 + 2	Student Q&A and Review	B1, B2, C1, D1	Lecture / Lab	a, c, e, h
15	3 + 0	Final Exam	—	Exam	a, b

Legend for Assessment Methods:

- **a**: Achievement Tests
- **b**: Standard Tests
- **c**: Individual Skills Assessment
- **d**: Selection of Intellectual Questions
- **e**: College Peer Assessment
- **f**: Collective Project
- **g**: Random Group Project
- **h**: Student Performance Assessment
- **i**: Experience and Professionalism Assessment

12. 🏛 Infrastructure

I. 📚 Textbooks

- *JavaScript*, 6th Edition, Sasha Vodnik & Don Gosselin, Cengage Learning, 2015
  ISBN: 978-1-305-07844-4
- *Basics of Web Design: HTML5 & CSS3*, 3rd Edition, Terry Felke-Morris, Pearson, 2016
  ISBN: 978-0-133-97074-6

II. ∞ References & Online Resources

- Codecademy: HTML & CSS Catalog
- Codecademy Main Site
- Coder Coder: Learn Web Development

III. 🕮 Recommended Reading (Periodicals, Reports, etc.)

- Articles and tutorials from *Smashing Magazine* (https://www.smashingmagazine.com)
- Reports and case studies from *W3C* (https://www.w3.org)
- Web development insights from *MDN Web Docs* (https://developer.mozilla.org)

IV. 🌐 E-References & Websites

- Codecademy
- Coder Coder
- YouTube Videos — curated playlists on HTML, CSS, and JavaScript tutorials
- freeCodeCamp — interactive coding lessons and projects
- MDN Web Docs — comprehensive documentation and examples

Course Name: Mobile Application Development

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1. Course Code: *(Not specified in source — please provide if available)*

2. Semester / Year: 1 / 2024–2025

3. Description Preparation Date: 15/09/2024

4. Available Attendance Forms: Theoretical (Blended Learning, Self-Learning, Practical Sessions)

5. Number of Credit Hours (Total) / Number of Units (Total): 60 Hours (Theory + Practical)

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Understand the methods of developing mobile applications and managing the process with minimal cost and maximum efficiency.
- Describe the concepts and theories of application development.
- Demonstrate new skills through the use of resources, tools, and technologies central to mobile application development.
- Explore and evaluate applications to enhance efficiency through added capabilities during development.

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8. Teaching and Learning Strategies:

- Blended Learning
- Self-Learning
- Learning by Experimentation
- Brainstorming
- Cooperative Learning
- Indirect Learning

---

9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Understand Android platform basics	Introduction to Android platform: VM, tools, Java packages, emulators, services	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
2	4	Explain app structure and lifecycle	Structure and lifecycle of Android applications	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
3	4	Design GUI layouts and handle events	Graphical User Interface: containers, components, layout, event handling	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
4	4	Manage app resources and file systems	Application resources, content providers, file system	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
5	4	Implement data persistence	Backups, databases	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
6	4	Apply app security principles	Security architecture, permissions, signing, user identification	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
7	4	Mid-term assessment	Implementation exam	Blended Learning	Standard Tests
8	4	Process multimedia and graphics	Multimedia, 2D/3D graphics	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
9	4	Develop simple games	Game programming basics	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
10	4	Use GPS data in apps	Geolocation services	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
11	4	Implement Bluetooth communication	Basics, permissions, device discovery, connectivity	Blended Learning	Standard Tests

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
12	4	Deploy applications	Localization, signing, versioning, licensing	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
13	4	Present project work	Project discussion	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
14	4	Group project evaluation	Group project discussion	Blended Learning	Achievement Tests, Oral Presentation, Project, Individual Skills
15	4	Final exam	Final assessment	Blended Learning	Final Exam

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10. Course Evaluation:

- Theory: 50%
- Practical: 50%
- Coursework breakdown:
  - Theory Tests (T1, T2): 50%
  - Practical: 15%
  - Seminar: 15%
  - Attendance & Quizzes: 10%
  - Final Exam: 50% (Theory 50%, Practical 50%)

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11. Learning and Teaching Resources:

- **Required Textbooks:** *(Not specified — please provide)*
- **Main References:** Foley, Mary Jo (2017)
- **Recommended Books & References:**
  - "Launching Your App on Devices" – developer.apple.com
  - https://www.toptal.com/app/developing-mobile-web-apps-when-why-and-how
  - https://medium.com/@essentialdesign/top-10-app-development-review-websites-2018-18f1e3049c62
- **Electronic References/Websites:** As above

Course Description Form

Course Name: Wireless Body Sensor Networks

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1. Course Code: ITC310300

2. Semester / Year: 6 / 2024–2025

3. Description Preparation Date: 1/10/2024

4. Available Attendance Forms: Theory + Laboratory (Core Module)

5. Number of Credit Hours (Total) / Number of Units (Total): 125 total hours (63 structured + 62 unstructured) / 5 ECTS

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6. Course Administrator's Name (mention all, if more than one name):
Name: Dr. Waleed Khalid
Email: dr.waleed.khalid@uoitc.edu.iq

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7. Course Objectives:

- Develop problem-solving skills and understanding of wireless networks.
- Understand wireless network applications and types.
- Learn the basic concepts of sensing and sensors, including classifications.
- Understand how Wireless Sensor Networks (WSN) operate.
- Learn typical m-Health system architecture and gain knowledge of biophysical signals and sensors.

---

8. Teaching and Learning Strategies:

- Lectures and interactive tutorials
- Laboratory experiments with practical applications
- Student engagement through problem-solving tasks
- Hands-on work with Arduino and sensor integration

---

9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Describe wireless networks and IEEE standards	Introduction to wireless networks, IEEE standards	Lecture + Lab	Quizzes, Assignments
2	4	Explain applications and types of wireless networks	Wireless network applications, types	Lecture + Lab	Quizzes, Assignments
3	4	Identify benefits and disadvantages of WLANs	Benefits/disadvantages of WLANs	Lecture + Lab	Quizzes, Assignments
4	4	Understand wireless MANs	Wireless MANs, benefits	Lecture + Lab	Quizzes, Assignments
5	4	Explain sensing and sensors	Introduction to sensing, sensor classifications	Lecture + Lab	Assignments
6	4	Describe WSN operation and node structure	WSN architecture	Lecture + Lab	Assignments
7	4	Mid-term assessment	Midterm Exam	Written Exam	Midterm Exam
8	4	Evaluate WSN advantages/disadvantages	Body Sensor Networks background	Lecture + Lab	Assignments
9	4	Identify biosensor types	Types of biosensors	Lecture + Lab	Assignments
10	4	Explain m-Health architecture	Hardware architecture, communication medium	Lecture + Lab	Assignments
11	4	Analyze BSN power consumption	BSN power considerations	Lecture + Lab	Assignments
12	4	Compare BSN topologies	Star, mesh, clustered	Lecture + Lab	Assignments
13	4	Identify biophysical signals and applications	BSN application domains	Lecture + Lab	Assignments
14	4	Operate Arduino devices	Arduino device description	Lab	Project
15	4	Integrate sensors with Arduino	Arduino and sensor connections	Lab	Project

10. Course Evaluation:

- **Formative Assessment:**
  - Quizzes: 10%
  - Assignments: 10%
  - Lab Project: 10%
  - Report: 10%
- **Summative Assessment:**

    - Midterm Exam: 10%
    - Final Exam: 50%
- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
    - *Energy-Efficient Algorithms and Protocols for Wireless Body Sensor Networks* (2020)
- **Recommended Books:**
    - *Wearable Technologies and Wireless Body Sensor Networks for Healthcare* – Fernando Jose Veles, Ferdin Derogarian Miyandoab
- **Electronic References/Websites:**

Course Description Form

Course Name: Medical Image Processing

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 2 / 2024–2025

3. Description Preparation Date: 18/02/2025

4. Available Attendance Forms: Theoretical + Practical

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

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Understand types of medical imaging and their clinical applications.
- Apply image preprocessing techniques to medical images.
- Extract and analyze image features for diagnosis and research.
- Gain both theoretical knowledge and practical skills in medical image processing.

8. Teaching and Learning Strategies:

- Blended Learning
- Self-Learning
- Learning by Experimentation
- Brainstorming
- Cooperative Learning
- Laboratory-based practical work using Python for image processing

9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Understand basics of medical imaging	Overview, applications, techniques	Lecture + Lab	Attendance, Quizzes
2	4	Apply preprocessing techniques	Normalization, denoising, deblurring, artifact removal, resampling	Lecture + Lab	Assignments
3	4	Identify imaging modalities	X-ray, CT, MRI, ultrasound, nuclear medicine, microscopy	Lecture + Lab	Quizzes
4	4	Interpret imaging data	Ultrasound, nuclear medicine, microscopy	Lecture + Lab	Assignments
5	4	Manage image storage	Formats, storage challenges	Lecture + Lab	Assignments
6	4	Apply enhancement techniques	Restoration, enhancement methods	Lecture + Lab	Assignments
7	4	Mid-term assessment	Midterm Exam	Written + Practical	Midterm Exam
8	4	Apply filtering methods	Linear and nonlinear filtering	Lecture + Lab	Assignments
9	4	Implement segmentation prep	Thresholding, binarization	Lecture + Lab	Assignments
10	4	Enhance contrast	Contrast enhancement, SNR, histogram modeling	Lecture + Lab	Assignments
11	4	Perform segmentation	Objectives, techniques	Lecture + Lab	Assignments
12	4	Normalize and register images	Techniques and applications	Lecture + Lab	Assignments
13	4	Search and retrieve images	Retrieval techniques	Lecture + Lab	Assignments

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
14	4	Detect edges and recognize objects	Edge detection methods, object recognition	Lecture + Lab	Assignments
15	4	Final preparation	Review and final exam	Lecture + Lab	Final Exam

---

10. Course Evaluation:

- Theory: 50%
- Practical: 50%
- Coursework breakdown:
  - T1: 10%
  - T2: 10%
  - Quizzes: 5%
  - Assignments: 5%
  - Attendance: 5%
  - Other coursework: 5%
  - Final Exam: 50%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - Dougherty, Geoff (ed.). *Medical Image Processing: Techniques and Applications*. Springer.
  - Dhawan, Atam P. *Medical Image Analysis*. John Wiley & Sons.
  - Deserno, T.M. (ed.). *Biomedical Image Processing*.
- **Recommended References:**
  - Relevant scientific journals and reports in biomedical imaging.

Course Description Form

Course Name: Information Security in Healthcare

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 2 / 2024–2025

3. Description Preparation Date: 16/01/2025

4. Available Attendance Forms: Theoretical + Practical (In-person)

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

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Introduce fundamental concepts and terminology in information security.
- Explain preliminary cryptographic techniques and public key cryptosystems.
- Understand authentication methods and their application in healthcare systems.
- Recognize threats, breaches, and defense mechanisms in healthcare data environments.

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8. Teaching and Learning Strategies:

- Daily quizzes and continuous assessment
- Class activities and discussions
- Guided exploration of relevant websites and applications
- Practical exercises linked to real-world healthcare security scenarios
- Group assignments and collaborative problem-solving

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9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Recognize the basic idea of security	Introduction to computer security	Theory + Practical	Daily quiz, Homework
2	4	Understand concepts of cyber security	Kinds of breaches and attacks	Theory + Practical	Daily quiz, Homework
3	4	Learn concepts of attack and threats	Methods of defense, Cryptographic techniques	Theory + Practical	Daily quiz, Homework
4	4	List types of traditional cryptosystems	Ceaser cipher, Multiplicative cipher	Theory + Practical	Daily quiz, Homework
5	4	Learn monophonic encryption methods	Keyword mixed cipher	Theory + Practical	Daily quiz, Homework
6	4	Learn multi-key encryption methods	Homophonic substitution, Vigenère, Bearfut cipher	Theory + Practical	Daily quiz, Homework
7	4	Learn homophonic encryption methods	Columnar, Playfair, Hill cipher	Theory + Practical	Daily quiz, Homework
8	4	Understand one-time pad encryption	One time pad	Theory + Practical	Daily quiz, Homework
9	4	Define Feistel and DES methods	DES	Theory + Practical	Daily quiz, Homework
10	4	Identify DES key generation	DEA	Theory + Practical	Daily quiz, Homework
11	4	Compare DEA and DES	Create 16 subkeys, encode 64-bit blocks	Theory + Practical	Daily quiz, Homework
12	4	Discuss cryptanalysis and weaknesses	Decryption process, Weakness of DES	Theory + Practical	Daily quiz, Homework
13	4	Explain public key encryption	Knapsack, RSA, Diffie-Hellman	Theory + Practical	Daily quiz, Homework
14	4	Recognize authentication concepts	Authentication	Theory + Practical	Daily quiz, Homework
15	4	Explain cryptanalysis basics	Cryptanalyst, attacker vs. cryptanalyst	Theory + Practical	Daily quiz, Homework

10. Course Evaluation:

- **Coursework:**
  - Daily quizzes and homework: 20%
  - Class participation and activities: 10%
  - Projects/Seminars: 10%
- **Exams:**
  - Midterm: 10%
  - Final Exam: 50%
- **Total:** 100%

11. Learning and Teaching Resources:

- **Required Textbooks:**
  - *Cryptography and Network Security: Principles and Practice*, William Stallings, Pearson, 5th Ed., 2010.
  - *Cybersecurity Essentials*, Charles J. Brooks et al., Sybex, 1st Ed., 2017.
- **Main References:**
  - *Cryptography & Network Security*, Behrouz A. Forouzan, McGraw-Hill, 2007.
- **Recommended Reading:**
  - *Computer Security and Cryptography*, Alan G. Konheim.
- **Electronic References:**
  - https://insider.ssi-net.com/insights/what-is-the-difference-between-data-security-and-cyber-security
  - https://www.secureworld.io/industry-news/cybersecurity-vs-data-security-definition
  - https://www.777networks.co.uk/data-security-vs-cyber-security-whats-the-difference/

Course Description Form

Course Name: Big Data Analysis in Healthcare

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 1 / 2024–2025

3. Description Preparation Date: 15/09/2024

4. Available Attendance Forms: Theoretical + Practical

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

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Understand the concepts, characteristics, and business implications of Big Data in healthcare.
- Gain practical skills in Hadoop and its ecosystem for healthcare data processing.
- Apply machine learning techniques using R for healthcare analytics.
- Interpret and explain ethical and legal issues in healthcare data management.
- Develop the ability to design and implement Big Data solutions for healthcare systems.

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8. Teaching and Learning Strategies:

- Blended Learning
- Self-Learning
- Learning by Experimentation
- Brainstorming
- Practical case studies and projects

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9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2T + 2P	Define Big Data concepts	Introduction to Big Data	Blended Learning	Achievement Tests, Oral Presentation
2	2T + 2P	Explain Hadoop basics	Introduction to Hadoop	Blended Learning	Achievement Tests, Oral Presentation
3	2T + 2P	Use HDFS	Hadoop Distributed File System	Blended Learning	Achievement Tests, Oral Presentation
4	2T + 2P	Apply MapReduce	MapReduce (Part 1)	Blended Learning	Achievement Tests, Oral Presentation
5	2T + 2P	Apply MapReduce	MapReduce (Part 2)	Blended Learning	Achievement Tests, Oral Presentation
6	2T + 2P	Midterm assessment	Midterm Exam	Blended Learning	Standard Test
7	2T + 2P	Identify Hadoop ecosystem components	Hadoop Ecosystem Overview	Blended Learning	Achievement Tests, Oral Presentation
8	2T + 2P	Use Pig for data processing	Hadoop Ecosystem – Pig	Blended Learning	Achievement Tests, Oral Presentation
9	2T + 2P	Use Hive for data queries	Hadoop Ecosystem – Hive	Blended Learning	Achievement Tests, Oral Presentation
10	2T + 2P	Use HBase for NoSQL storage	Hadoop Ecosystem – HBase	Blended Learning	Achievement Tests, Oral Presentation

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
11	2T + 2P	Apply Big SQL	Hadoop Ecosystem – Big SQL (Part 1)	Blended Learning	Achievement Tests, Oral Presentation
12	2T + 2P	Apply Big SQL	Hadoop Ecosystem – Big SQL (Part 2)	Blended Learning	Achievement Tests, Oral Presentation
13	2T + 2P	Perform analytics in R	Data Analytics with R (Part 1)	Blended Learning	Achievement Tests, Oral Presentation
14	2T + 2P	Perform analytics in R	Data Analytics with R (Part 2)	Blended Learning	Achievement Tests, Oral Presentation
15	2T + 2P	Prepare for final exam	Review and Final Preparation	Blended Learning	Final Exam

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10. Course Evaluation:

- **Coursework:**
  - Theory Tests (T1, T2): 20%
  - Assignments: 10%
  - Attendance & Participation: 10%
  - Project: 10%
- **Exams:**
  - Final Exam: 50% (Theory 30%, Practical 20%)
- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - Tom White, *Hadoop: The Definitive Guide*, 3rd Edition, O'Reilly Media, 2012.
  - Seema Acharya, Subhasini Chellappan, *Big Data Analytics*, Wiley, 2015.
- **Recommended References:**
  - Relevant periodicals and reports on healthcare data analytics.
- **Electronic References:** *(To be listed if available)*

Course Description Form

Course Name: Clinical Data Mining

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 1 / 2024–2025

3. Description Preparation Date: 05/10/2024

4. Available Attendance Forms: Theoretical + Practical (Direct)

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

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Provide a comprehensive understanding of **data warehousing** concepts, architecture, and applications in clinical contexts.
- Equip students with knowledge of **data mining techniques** (classification, clustering, association rule mining) for healthcare problem-solving.
- Demonstrate the application of data mining to **improve clinical decision-making, patient outcomes, and healthcare research**.
- Address **ethical, legal, and privacy considerations** in mining sensitive clinical data.

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8. Teaching and Learning Strategies:

- E-Learning
- Self-Learning
- Learning by Experimentation
- Cooperative Learning
- Case studies and real-world clinical datasets

9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understand fundamentals of data warehousing	Introduction to Data Warehousing	Lecture + Reading Assignments	Quiz, Class Discussion
2	3	Describe architecture and OLAP	Data Warehouse Architecture	Lecture + Lab	Assignment, Lab Work
3	3	Define data mining and processes	Data Mining Overview	Lecture + Case Studies	Quiz, Written Report
4	2	Identify data mining systems and KDD process	Classification of Data Mining Systems & KDD	Lecture + Reading Assignments	Quiz, Class Discussion
5	2	Apply Apriori algorithm	Frequent Itemsets Mining Methods	Lecture + Reading Assignments	Quiz, Class Discussion
6	—	Midterm Exam	—	Written Exam	Midterm
7	2	Build classification models	Decision Trees & Bayesian Classification	Lecture + Reading Assignments	Quiz, Class Discussion
8	2	Implement advanced classification	Genetic Algorithms, Fuzzy Sets	Lecture + Reading Assignments	Quiz, Class Discussion
9	2	Continue advanced classification	Genetic Algorithms, Fuzzy Sets	Lecture + Reading Assignments	Quiz, Class Discussion
10–13	2	Apply clustering techniques	Cluster Analysis	Lecture + Reading Assignments	Quiz, Class Discussion
14	2	Apply clustering in clinical datasets	Cluster Analysis (cont.)	Lecture + Reading Assignments	Quiz, Class Discussion
15	2	Final review and assessment	—	Lecture + Discussion	Final Exam

10. Course Evaluation:

- **Coursework:**
  - T1: 5%
  - T2: 5%
  - Assignments: 5%
  - Attendance: 5%
- **Exams:**
  - Final Exam: 50% (Theory 30%, Practical 20%)
- **Total:** 100%

11. Learning and Teaching Resources:

- **Required Textbooks:**
  - Han & Kamber, *Data Mining: Concepts and Techniques*, Morgan Kaufmann.
  - M.H. Dunham, *Data Mining: Introductory and Advanced Topics*, Pearson Education.
- **Recommended References:**
  - Relevant journals and reports in clinical data analytics.
- **Electronic References:** *(To be listed if available)*

Course Description Form

Course Name: Cloud Computing

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 1 / 2023–2024

3. Description Preparation Date: 15/09/2024

4. Available Attendance Forms: Direct (In-person)

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

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Understand the fundamentals of cloud computing technology.
- Compare Grid Computing and Cloud Computing concepts.
- Create and manage virtual machines and containers.
- Understand the architecture and components of cloud systems.
- Learn the steps to set up a private cloud environment.

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8. Teaching and Learning Strategies:

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

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9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Understand cloud basics	History of the Cloud, Types of Cloud Services, Cloud Problems	Direct	Direct Questions
2	4	Explain cloud network architecture	Connect to Cloud, Data Center Networks, Hybrid Cloud Deployments	Direct	Direct Questions
3	4	Compare Grid vs Cloud	Basics of Grid Computing, Layered Models, Abstraction	Direct	Direct Questions
4	4	Understand service orientation	Web Services, Data Management, Security, Autonomic Computing	Direct	Direct Questions
5	4	Identify cloud attributes	Infrastructure systems, Application software, Cloud vs Cloud Services	Direct	Direct Questions
6	4	Midterm Exam	—	—	Standard Test
7	4	Explain virtualization concepts	What Virtualization Can Do, Resource Optimization, Security	Direct	Direct Questions
8	4	Describe virtualization types	Virtual Machines, Hypervisors	Direct	Direct Questions
9	4	Apply virtualization	Server, Network, Desktop Virtualization	Direct	Direct Questions
10	4	Understand containers	Containers vs VMs, Benefits of Containers	Direct	Direct Questions
11	4	Explore clustering	Cluster Computing, Kubernetes	Direct	Direct Questions
12	4	Midterm Exam 2	—	—	Standard Test
13	4	Apply cloud in healthcare	Cloud-based Medical Information Systems	Direct	Direct Questions
14	4	Explore distributed cloud apps	Web-based Patient Records, Scalability	Direct	Direct Questions
15	4	Present projects	Seminars and Discussions	Direct	Project Evaluation

10. Course Evaluation:

- **Coursework:**
  - T1: 10%
  - T2: 10%
  - Assignments: 5%
  - Attendance: 5%
  - Project: 10%
- **Exams:**
  - Final Exam: 50% (Theory 30%, Practical 20%)
- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - *Handbook of Cloud Computing* – Borko Furht, Armando Escalante
- **Recommended References:**
  - *Zen of Cloud: Learning Cloud Computing by Examples* (2nd Ed.)
  - *The Complete Cloud Computing Manual* – 5th Edition, 2020
- **Electronic References:** *(To be listed if available)*

Course Description Form

Course Name: Deep Learning

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 1 / 2024–2025

3. Description Preparation Date: 15/09/2024

4. Available Attendance Forms: Full-time (Theoretical + Practical)

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

6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Equip students with tools and techniques for handling large datasets.
- Provide a solid theoretical foundation in neural networks and deep learning.
- Implement neural components and apply deep learning to real-world datasets using modern frameworks.
- Familiarize students with publicly available libraries and datasets for various DL applications.

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8. Teaching and Learning Strategies:

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

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9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understand DL fundamentals	Introduction to Deep Learning	Direct + E-Learning	Performance Assessment
2	2	Apply backpropagation	Backpropagation & Multi-layer Perceptron	Direct + E-Learning	Performance Assessment
3	2	Train neural networks	Training Neural Networks	Direct + E-Learning	Quiz
4	2	Use Keras for ML workflows	Using Keras	Direct + E-Learning	Performance Assessment
5	2	Apply DL to images	Deep Learning on Images	Direct + E-Learning	Performance Assessment
6	2	Understand CNN architecture	CNN Architecture – Part 1	Direct + E-Learning	Performance Assessment

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
7	2	Identify CNN applications	CNN Architecture – Part 2	Direct + E-Learning	Performance Assessment
8	2	Explore RNN types	Special Types of RNNs	Direct + E-Learning	Performance Assessment
9	2	Midterm Exam 1	—	Direct + E-Learning	Exam
10	2	Apply unsupervised DL	Unsupervised Approaches in DL	Direct + E-Learning	Quiz
11	2	Implement GANs	Generative Adversarial Networks	Direct + E-Learning	Performance Assessment + Achievement Tests
12	2	Detect objects in DL	Object Detection – Part 1	Direct + E-Learning	Performance Assessment
13	2	Midterm Exam 2	—	Direct + E-Learning	Exam
14	2	Continue object detection	Object Detection – Part 2	Direct + E-Learning	Performance Assessment + Achievement Tests
15	2	Final Exam	—	Direct + E-Learning	Final Exam

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10. Course Evaluation:

- **Coursework:**
  - T1: 22%
  - T2: 22%
  - Quizzes: 4%
  - Assignments: 2%
- **Exams:**
  - Final Exam: 50%
- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - *Artificial Intelligence: A Modern Approach* (3rd Edition)
  - *Constructing Intelligent Agents with Java*
- **Recommended References:** *(Not specified — please provide)*
- **Electronic References:** *(To be listed if available)*

Course Description Form

Course Name: Simulation and Modeling

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 1 / 2024–2025

3. Description Preparation Date: 15/09/2024

4. Available Attendance Forms: Theoretical + Practical

5. Number of Credit Hours (Total) / Number of Units (Total): 60 Hours / 4 Credits

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Understand key concepts in simulation and modeling, including discrete-event, agent-based, Monte Carlo, and molecular dynamics simulations, as well as machine learning algorithms.
- Gain proficiency in industry-standard tools such as MATLAB, Python, R, and RapidMiner.
- Apply simulation and modeling techniques to real-world applications in healthcare, drug discovery, and other domains.
- Analyze and interpret simulation results using statistical and visualization methods.
- Develop teamwork, communication, and critical thinking skills through collaborative projects.

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8. Teaching and Learning Strategies:

- Lectures with interactive discussions
- Hands-on laboratory exercises
- Group projects on real-world simulation scenarios
- Case studies and problem-based learning
- Self-learning and cooperative learning

---

9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Understand simulation concepts and applications in medicine	Introduction to Medical Simulation and Modeling	Blended Learning	Achievement Tests, Oral Presentation, Project
2	4	Identify and install simulation tools	Industry-Standard Software Tools Overview	Blended Learning	Achievement Tests, Oral Presentation, Project
3	4	Collect and preprocess data for simulations	Data Collection and Preprocessing	Blended Learning	Achievement Tests, Oral Presentation, Project
4	4	Design and implement simulations	Simulation Design and Implementation	Blended Learning	Achievement Tests, Oral Presentation, Project
5	4	Apply modeling techniques	Modeling Techniques in Medicine	Blended Learning	Achievement Tests, Oral Presentation, Project
6	4	Validate and verify models	Validation and Verification	Blended Learning	Achievement Tests, Oral Presentation, Project
7	4	Apply statistical analysis to models	Statistical Analysis in Simulation	Blended Learning	Standard Test
8	4	Explore case studies	Case Studies and Real-World Applications	Blended Learning	Achievement Tests, Oral Presentation, Project
9	4	Implement advanced modeling	Advanced Simulation Techniques	Blended Learning	Achievement Tests, Oral Presentation, Project
10	4	Address ethical considerations	Ethical Considerations in Simulation	Blended Learning	Achievement Tests, Oral Presentation, Project
11	4	Apply verification techniques	Verification and Sensitivity Analysis	Blended Learning	Standard Test
12	4	Explore future trends	Future Directions in Simulation	Blended Learning	Achievement Tests, Oral Presentation, Project
13	4	Work on applied projects	Group Project Work	Blended Learning	Project Evaluation
14	4	Present project outcomes	Project Presentations	Blended Learning	Project Evaluation
15	4	Final assessment	Final Exam	Blended Learning	Final Exam

10. Course Evaluation:

- **Coursework:**
  - T1: 10%
  - T2: 10%
  - Seminar/Assignments: 10%
  - Attendance & Quizzes: 10%
  - Project: 10%
- **Exams:**
  - Final Exam: 50%
- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - Colquhoun, J. N., Keegan, B. C., & Bordley, W. E. *Medical Simulation and Modeling: Techniques, Tools, and Applications*. CRC Press.
  - Houghton, M. J. *Medical Simulation: An Introduction with Applications*. John Wiley & Sons.
- **Recommended References:**
  - *Advanced Topics in Medical Simulation and Modeling Research* – Colquhoun et al.
- **Electronic References:**
  - www.medsimweb.com

Course Description Form

Course Name: Health Systems Administration I

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 1 / 2024–2025

3. Description Preparation Date: 01/09/2024

4. Available Attendance Forms: Theoretical

5. Number of Credit Hours (Total) / Number of Units (Total): 30 Hours

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Understand healthcare systems in both developed and developing countries.
- Analyze ethical and legal issues in healthcare delivery.
- Examine management functions, leadership styles, and healthcare marketing concepts.
- Evaluate healthcare policies, reforms, and quality improvement strategies.
- Develop the ability to compare curative and preventive healthcare activities and their legislative frameworks.

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8. Teaching and Learning Strategies:

- Blended Learning
- Self-Learning
- Learning by Experimentation
- Brainstorming
- Interactive discussions and case studies

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9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify healthcare system structure and key divisions	Health Care System: Structure, Key Divisions, Insurance Plans, Key Industries	Blended Learning	Achievement Tests, Oral Presentation, Project
2	2	Understand healthcare delivery and reform	Comprehensive Overview of Health Care Delivery and Reform	Blended Learning	Achievement Tests, Oral Presentation, Project
3	2	Evaluate healthcare safety nets and quality	Healthcare Safety Net, Quality, Efficiency, Global Data Insights	Blended Learning	Achievement Tests, Oral Presentation, Project
4	2	Analyze legal aspects of healthcare	Key Legal and Regulatory Aspects of Healthcare Compliance and Protection	Blended Learning	Achievement Tests, Oral Presentation, Project
5	2	Apply ethical decision-making in healthcare	Key Ethical Considerations in Medical Practice and Decision Making	Blended Learning	Achievement Tests, Oral Presentation, Project
6	2	Assess national healthcare challenges	Overview and Challenges of the National Iraqi Healthcare System	Blended Learning	Achievement Tests, Oral Presentation, Project
7	2	Midterm Exam	—	Blended Learning	Standard Test
8	2	Examine healthcare policy and financing	Healthcare Policy, Regulation, Financing, and Reimbursement	Blended Learning	Achievement Tests, Oral Presentation, Project
9	2	Apply leadership in population health	Leadership and Management in Population Health	Blended Learning	Achievement Tests, Oral Presentation, Project
10	2	Enhance healthcare through marketing	Enhancing Healthcare through Marketing, Communications, and Quality Improvement	Blended Learning	Achievement Tests, Oral Presentation, Project
11	2	Midterm 2	—	Blended Learning	Standard Test

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
12	2	Improve healthcare systems	Advancing Healthcare through Quality Improvement, Supply Chain Management, Workforce Development	Blended Learning	Achievement Tests, Oral Presentation, Project
13	2	Integrate innovations in healthcare	Innovations in Telehealth, Ethics, Law, and Emergency Preparedness	Blended Learning	Achievement Tests, Oral Presentation, Project
14	2	Design sustainable healthcare solutions	Advancing Patient-Centric and Economically Sustainable Integrated Healthcare Solutions	Blended Learning	Achievement Tests, Oral Presentation, Project
15	2	Final Exam	—	Blended Learning	Final Exam

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10. Course Evaluation:

- **Coursework:**
  - T1: 15%
  - T2: 15%
  - Seminar: 10%
  - Attendance & Quizzes: 10%
- **Exams:**
  - Final Exam: 50%
- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - Peter C. Olden, Cathleen O. Erwin, *Management of Healthcare Organizations: An Introduction*, 4th Ed., 2023.
- **Main References:**
  - Patrice L. Spath, *Introduction to Healthcare Quality Management*, 3rd Ed., 2018.
  - Michael Nowicki, *Introduction to the Financial Management of Healthcare Organizations*, 6th Ed., 2014.
- **Electronic References:**
  - https://study.com/academy/course/health-303-healthcare-organization-management.html

Course Description Form

Course Name: Health Systems Administration I

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 1 / 2024–2025

3. Description Preparation Date: 01/09/2024

4. Available Attendance Forms: Theoretical

5. Number of Credit Hours (Total) / Number of Units (Total): 30 Hours

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Understand healthcare systems in both developed and developing countries.
- Analyze ethical and legal issues in healthcare delivery.
- Examine management functions, leadership styles, and healthcare marketing concepts.
- Evaluate healthcare policies, reforms, and quality improvement strategies.
- Develop the ability to compare curative and preventive healthcare activities and their legislative frameworks.

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8. Teaching and Learning Strategies:

- Blended Learning
- Self-Learning
- Learning by Experimentation
- Brainstorming
- Interactive discussions and case studies

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9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify healthcare system structure and key divisions	Health Care System: Structure, Key Divisions, Insurance Plans, Key Industries	Blended Learning	Achievement Tests, Oral Presentation, Project
2	2	Understand healthcare delivery and reform	Comprehensive Overview of Health Care Delivery and Reform	Blended Learning	Achievement Tests, Oral Presentation, Project
3	2	Evaluate healthcare safety nets and quality	Healthcare Safety Net, Quality, Efficiency, Global Data Insights	Blended Learning	Achievement Tests, Oral Presentation, Project
4	2	Analyze legal aspects of healthcare	Key Legal and Regulatory Aspects of Healthcare Compliance and Protection	Blended Learning	Achievement Tests, Oral Presentation, Project
5	2	Apply ethical decision-making in healthcare	Key Ethical Considerations in Medical Practice and Decision Making	Blended Learning	Achievement Tests, Oral Presentation, Project
6	2	Assess national healthcare challenges	Overview and Challenges of the National Iraqi Healthcare System	Blended Learning	Achievement Tests, Oral Presentation, Project
7	2	Midterm Exam	—	Blended Learning	Standard Test
8	2	Examine healthcare policy and financing	Healthcare Policy, Regulation, Financing, and Reimbursement	Blended Learning	Achievement Tests, Oral Presentation, Project
9	2	Apply leadership in population health	Leadership and Management in Population Health	Blended Learning	Achievement Tests, Oral Presentation, Project
10	2	Enhance healthcare through marketing	Enhancing Healthcare through Marketing, Communications, and Quality Improvement	Blended Learning	Achievement Tests, Oral Presentation, Project
11	2	Midterm 2	—	Blended Learning	Standard Test

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
12	2	Improve healthcare systems	Advancing Healthcare through Quality Improvement, Supply Chain Management, Workforce Development	Blended Learning	Achievement Tests, Oral Presentation, Project
13	2	Integrate innovations in healthcare	Innovations in Telehealth, Ethics, Law, and Emergency Preparedness	Blended Learning	Achievement Tests, Oral Presentation, Project
14	2	Design sustainable healthcare solutions	Advancing Patient-Centric and Economically Sustainable Integrated Healthcare Solutions	Blended Learning	Achievement Tests, Oral Presentation, Project
15	2	Final Exam	—	Blended Learning	Final Exam

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10. Course Evaluation:

- **Coursework:**
  - T1: 15%
  - T2: 15%
  - Seminar: 10%
  - Attendance & Quizzes: 10%
- **Exams:**
  - Final Exam: 50%
- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - Peter C. Olden, Cathleen O. Erwin, *Management of Healthcare Organizations: An Introduction*, 4th Ed., 2023.
- **Main References:**
  - Patrice L. Spath, *Introduction to Healthcare Quality Management*, 3rd Ed., 2018.
  - Michael Nowicki, *Introduction to the Financial Management of Healthcare Organizations*, 6th Ed., 2014.
- **Electronic References:**
  - https://study.com/academy/course/health-303-healthcare-organization-management.html

Course Description Form

Course Name: Human-Computer Interaction (E-HCI)

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: 2024–2025

3. Description Preparation Date: 16/01/2025

4. Available Attendance Forms: Theoretical + Practical

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

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Define the fundamentals of interaction between humans and computers.
- Understand cognitive processes and how users interact with interfaces.
- Design interactive systems and evaluate usability.
- Apply HCI principles to software development and interface design.
- Encourage critical thinking and problem-solving in interface evaluation.

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8. Teaching and Learning Strategies:

- Daily quizzes and class activities
- Group assignments and seminars
- Guided exploration of relevant websites and tools
- Practical design and prototyping exercises
- Brainstorming and collaborative learning

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9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Learn HCI fundamentals	Introduction to Human-Computer Interaction	Theory + Practical	Daily Quiz, Homework
2	4	Understand interaction design	Interaction Design	Theory + Practical	Daily Quiz, Homework
3	4	Explore cognitive foundations	Cognition	Theory + Practical	Daily Quiz, Homework
4	4	Analyze cognitive processes	Cognitive Processes	Theory + Practical	Daily Quiz, Homework
5	4	Examine social aspects of interaction	Social Interaction	Theory + Practical	Daily Quiz, Homework
6	4	Identify interface types	Interfaces	Theory + Practical	Daily Quiz, Homework
7	4	Practice prototyping	Prototyping	Theory + Practical	Daily Quiz, Homework
8	4	Apply design principles	Interaction Design Basics	Theory + Practical	Daily Quiz, Homework
9	4	Integrate HCI in software development	HCI in the Software Process	Theory + Practical	Daily Quiz, Homework
10	4	Evaluate interfaces	Evaluation Techniques	Theory + Practical	Daily Quiz, Homework
11	4	Midterm Exam	—	Theory + Practical	Standard Test
12	4	Assess usability	Usability	Theory + Practical	Daily Quiz, Homework
13	4	Understand user needs	Understanding Users	Theory + Practical	Daily Quiz, Homework
14	4	Design user interfaces	User Interface Design	Theory + Practical	Daily Quiz, Homework
15	4	Present final projects	Project Presentation	Theory + Practical	Project Evaluation

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10. Course Evaluation:

- **Coursework:**
  - T1: 10%
  - T2: 10%
  - Assignments: 5%
  - Attendance: 5%
  - Project: 10%
- **Exams:**
  - Final Exam: 50% (Theory 40%, Practical 10%)

- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - Ben Shneiderman & Catherine Plaisant, *Designing the User Interface: Strategies for Effective Human-Computer Interaction*, 4th Ed., Addison Wesley, 2004.
  - Alan Dix et al., *Human-Computer Interaction*, Prentice Hall, 2003.
- **Recommended References:**
  - Relevant journals and reports in HCI and interface design.

Course Description Form

Course Name: English Language IV

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1. Course Code: *(Not specified — please provide)*

2. Semester / Year: First Semester / 2024–2025

3. Description Preparation Date: 20/02/2024

4. Available Attendance Forms: In-class (Face-to-Face)

5. Number of Credit Hours (Total) / Number of Units (Total): 30 Hours

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6. Course Administrator's Name (mention all, if more than one name):
Name: *(Not specified — please provide)*
Email: *(Not specified — please provide)*

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7. Course Objectives:

- Develop students' ability to use English in scientific and engineering contexts.
- Strengthen grammar usage including tenses, numerals, equations, and modifiers.
- Improve reading, writing, speaking, and listening skills.
- Enable students to describe phenomena and scientific logic using clear English.
- Prepare students for English proficiency exams relevant to postgraduate studies or employment.

8. Teaching and Learning Strategies:

- Live lectures using whiteboard and digital projector
- Group activities and peer discussions
- Vocabulary and grammar drills
- Reading comprehension and writing exercises
- Oral presentations and listening practice

9. Course Structure:

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Use tense system in context	Home and Away	Live lecture + digital tools	Written/Oral Exam
2	2	Improve reading and speaking	Reading and Speaking	Live lecture + digital tools	Written/Oral Exam
3	2	Practice writing and speaking	Writing and Speaking	Live lecture + digital tools	Written/Oral Exam
4	2	Apply present perfect continuous	Been There, Got the T-shirt	Live lecture + digital tools	Written/Oral Exam
5	2	Enhance reading skills	Reading	Live lecture + digital tools	Written/Oral Exam
6	2	Use narrative tenses	News and Views	Live lecture + digital tools	Written/Oral Exam
7	2	Practice reading and listening	Reading & Listening	Live lecture + digital tools	Written/Oral Exam
8	2	Improve speaking fluency	Speaking	Live lecture + digital tools	Written/Oral Exam
9	2	Form questions and negatives	The Naked Truth	Live lecture + digital tools	Written/Oral Exam
10	2	Practice reading	Reading	Live lecture + digital tools	Written/Oral Exam
11	2	Use future tense	Looking Ahead	Live lecture + digital tools	Written/Oral Exam
12	2	Practice reading and speaking	Reading & Speaking	Live lecture + digital tools	Written/Oral Exam
13	2	Use expressions of quantity	Hitting the Big Time	Live lecture + digital tools	Written/Oral Exam
14	2	Practice reading and speaking	Reading & Speaking	Live lecture + digital tools	Written/Oral Exam

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
15	2	Integrate four language skills	General English	Live lecture + digital tools	Written/Oral Exam

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10. Course Evaluation:

- **Coursework:**
  - Assignments and homework: 10%
  - Quizzes: 10%
  - Attendance and participation: 10%
- **Exams:**
  - Midterm Exam: 30%
  - Final Exam: 40%
- **Total:** 100%

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11. Learning and Teaching Resources:

- **Required Textbooks:**
  - Liz and John Soars, *New Headway Plus, Upper-Intermediate*, 4th Edition, Oxford University Press
- **Main References:**
  - Raymond Murphy, *English Grammar in Use*
  - Michael McCarthy & Felicity O'Dell, *English Vocabulary in Use*
- **Electronic References:**
  - Coursera (e.g., “English for Career Development”)
  - BBC Learning English
  - Englishpage.com
  - ESLvideo.com
  - FluentU
  - Duolingo