Course Specification
(Bachelor)

Course Title:	Clinical Decision Support Systems
Course Code:	SE4021
Program:	Bachelor's Degree in Health Informatics
Department:	Software Egneering
College:	Computing
Institution:	Umm Al-Qura University
Version:	V.1
Last Revision Date:	22/04/2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (...3Hrs.....)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (8th Level - 4th Year)					
4. Course General Description:					
This course introduces students to the concepts, principles, and practices of Clinical Decision Support Systems (CDSS). Students will learn about the design, development, and implementation of CDSS in healthcare settings.					
5. Pre-requirements for this course (if any):					
None					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
• Understand the concept, history, design, and development of Clinical Decision Support Systems (CDSS), including their application in various healthcare settings. • Evaluate the effectiveness of CDSS, focusing on usability, user-centered design, and decision support for patients and diagnostics. • Analyze the ethical, legal, and policy-related challenges in implementing CDSS, while exploring best practices and newer architectures.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	00
3.	Field	00
4.	Tutorial	00
5.	Others (specify)	00
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Define the concepts, history, and foundational principles of Clinical Decision Support Systems (CDSS).	K1	✓ Interactive Academic Lectures ✓ Class and group discussions ✓ Textbook and research literature readings	✓ Examination
1.2	Describe the role of data science in the design and functionality of CDSS.	K1	✓ Interactive Academic Lectures ✓ Class and group discussions ✓ Textbook and research literature readings	✓ Examination
2.0	Skills			
2.1	Design CDSS frameworks incorporating usability and user-centered applications	S1&2	✓ Interactive Academic Lectures ✓ Class and group discussions	✓ Examination
2.2	Apply mathematical and data-mining techniques to	S1 and S2	✓ Interactive Academic Lectures ✓ Class and group discussions	✓ Examination

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	support decision-making within CDSS.			
2.3	Evaluate of CDSS in various healthcare settings	S1 and S2	✓ Interactive Academic Lectures ✓ Class and group discussions	✓ Examination
2.4	Assess ethical, legal, and national policy considerations associated with the implementation and use of CDSS.	S1 and S2	✓ Interactive Academic Lectures ✓ Class and group discussions	✓ Examination
3.0	Value			
3.1	Demonstrate ethical awareness and prioritize user-centered considerations in the use of CDSS.	V1	✓ Class and group discussions ✓ Individual and Group Case Studies ✓ Individual and Group Projects	✓ Assignments ✓ Presentations

C. Course Content

No	List of Topics	Contact Hours
1.	Overview of Clinical Decision Support Systems	6
2.	Mathematical Foundations of Decision Support Systems	3
3.	Data Mining and Clinical Decision Support Systems	6
4.	Usability and Clinical Decision Support	6
5.	Newer Architectures for Clinical Decision Support	3
6.	Best Practices for Implementation of Clinical Decision Support	3
7.	Impact of National Policies on the Use of Clinical Decision Support	3
8.	Ethical and Legal Issues in Decision Support	3
9.	Evaluation of Clinical Decision Support	3
10.	Decision Support for Patients	3
11.	Diagnostic Decision Support Systems	6

Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz	4th to 5th	10%
2.	Assignments	10th	10%
3.	Presentation	11th to 12th	10%
4.	Mid- Term Exam	7th – 8th	20%
5.	Final Exam	17th -18th	50%
	Total		100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Berner, E.S. (ed.) (2016) *Clinical Decision Support Systems: Theory and Practice*. 3rd edn. Cham: Springer. Available at: https://link.springer.com/book/10.1007/978-3-319-31913-1
Supportive References	Greenes, R.A. (ed.) (2014) *Clinical Decision Support: The Road to Broad Adoption*. 2nd edn. Amsterdam: Elsevier
Electronic Materials	ScienceDirect (n.d.) *Clinical Decision Support System*. Available at: https://www.sciencedirect.com/topics/computer-science/clinical-decision-support-system Decision Support Systems. Elsevier. Available at: https://www.sciencedirect.com/journal/decision-support-systems
Other Learning Materials	*Journals:* International Journal of Medical Informatics. Journal of the American Medical Informatics Association. Journal of Biomedical Informatics. BMC Medical Informatics and Decision Making. Health Informatics Journal.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with proper seating arrangement for students, Computer Lab.
Technology equipment (projector, smart board, software)	Projector/ Data Show with Screen, MS Office
Other equipment (depending on the nature of the specialty)	White Board with Marker

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	In-Direct
Effectiveness of Students assessment	Students, Committee Members	In-Direct
Quality of learning resources	Students, Course Review Committee	In-Direct
The extent to which CLOs have been achieved	Course Review Committee	In-Direct / Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**SOFTWARE ENGINEERING DEPARTMENT COUNCIL**
REFERENCE NO.	**THE 17TH MEETING FOR THE ACADEMIC YEAR 1446H**
DATE	**22/04/2025**