Course Syllabus/Specification

Course Specification

Electronic Health Records (EHRs) are digitized documents of health records of individuals. EHRs include electronically created Attending Physician Statements (APSs),information about a patient's medical history, diagnoses, medications, vaccination schedules, allergies, radiographs, lab and test results Provides access to evidence-based tools that providers can use in making decisions about patient care and health insurance. EHRs are governed by a strict government privacy law, the Health Insurance Portability and Accountability Act (HIPAA).

This course enables students to understand in depth the analysis of electronic health records workflows and the meaningful use of electronic health records and healthcare data systems; Design and implement a health care database and practices using electronic health records data using the latest version of the SQL server management studio, and understand the legal and regulatory issues that shape the development of electronic health records.

1. Teaching Institution	**University of Al-Mustaqbal college of Science**
2. Department / Center	**Intelligent Medical Systems Department**
3. Course Title /Code	**Electronic Health Record (EHR) MU03024201**
4. Modes of Attendance Offered	**Theoretical and practical**
5. Semester/Year	**Semester 2/2026-2025**
6. Number of Hours Tuition (Total)	**60 Hours**
7. Date of Production of this Specification	**18/2/2023**
8. Course Description	This course is an attempt to answer the many questions that arise when implementing an EMR system. As an aid to the student, the course is divided into two parts. In Part One the student will find in depth knowledge about EHR technologies, issues, and processes. It offers the background information required to understand the important EMR issues that arise as one journeys from initial curiosity to final implementation.Part Two has a

	completely different approach.It offers practical advice on the actual steps involved in implementing an EMR system. This course gives students the ability to use electronic health record systems in healthcare operations and learn about the role of electronic health records in ensuring quality of care and evidence-based practice. In addition, learn about the main concepts of applying electronic health records in clinical practices. The course will concentrate on: - The technological foundations of national electronic health record systems - Legal and regulatory issues shaping the evolution of electronic health records - The role of electronic health records in ensuring quality of care and evidence-based practice - Implementation of electronic health records in clinical practices: workflow analysis and change management - Meaningful use of electronic health records and healthcare data systems - Practice with electronic medical record data and healthcare database - Training experts in healthcare data and enhancing their skills in SQL programming - Understand SQL basics in depth, down to learning how to write and build complex SQL statements - and answer nested queries.

9. Aims of the Course

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

10. Course outcomes and methods of teaching, learning and assessment

A. Knowledge and Understanding

1. 1. Understanding the basic concepts of electronic health care record systems since their inception and the benefits they provide to countries that adopt them, legally adopting them until reaching future developments
2. 2. Highlighting the student's knowledge of the components and how to build an advanced electronic healthcare records system
3. 3. Understanding how electronic health care records data is stored, processed, and shared with the authorized and beneficiary entities
4. Develop student programming skills in building advanced database systems using the latest version of the SQL server management studio

Teaching and Learning Methods

- Blended-Learning
- Self-Learning
- Learning by Experimentation
- Brainstorming

Assessment Methods

- Achievement Tests
- Oral presentation
- Project
- Standard Tests
- Individual Skills Assessment
- Selection of Intellectual Question in Achievement tests

The course includes three main axes that the student must complete in order to pass the course successfully.

Readings: A list of readings arranged in the recommended order is provided for each unit. . Readings must be completed each week until you are ready to engage in class discussion. There are also optional readings to provide more in-depth exploration of topics of interest and/or background to help prepare papers/short presentations.

Discussion: We will use discussion as the main form of interaction in the course. Your responses to the weekly readings, your individual assignments, and your thoughtful responses to your classmates' posts show your level of understanding. Your active participation in the discussions is the best way to get the most out of the course!

Oral Presentations: The purpose of these assignments is to allow students to explore a topic in

more detail for each unit and to share the results with their classmates. Each student is required to submit a short report in slideshow format (10 slides not including title and reference slides) on a topic relevant to one of the course units. Suggested topics are presented in the classroom, but the student can choose other related topics (but after the approval of the teacher). Presentations should be based on scientific sources of information (be sure to include an appropriate list of references). And we should delve deeper into an interesting topic for each unit. Try to use non-text materials in your presentation (videos or online examples, tables, charts, and graphs) as a way to group and present the main ideas and themes. If some text is necessary, please limit it to very short paragraphs and bulleted lists. Although not a requirement, all presentations will be posted to Google Classroom and a resource for other class participants. The student is expected to answer the questions of his classmates.

B. Subject-Specific Skills.

This course provides the students the ability to :

- Analyze EHR workflow and adapt to changes
- 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

Teaching and Learning Methods

- Blended-Learning
- Learning by Experimentation
- Brainstorming
- Indirect Learning

Assessment Methods

-
- Achievement Tests
- Oral presentation
- Project
- Standard Tests
- Individual Skills Assessment
-

C. Critical Thinking Skills

- Desire and ability to learn for life.
- Ability to analyze and solve complex problems

Teaching and Learning Methods

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

Assessment Methods

- Achievement Tests
- Oral presentation
- Project
- Standard Tests
- Individual Skills Assessment
- Selection of Intellectual Question in Achievement tests

D. General and Transferable Skills

a. Ability to adopt lifelong learning.
b. Ability to communicate information with other specialization.
c. Ability to solve problems.
d. Ability to communicate effectively with colleagues in work environment.

Teaching and Learning Methods

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

Assessment Methods

- Individual Skills Assessment
- Selection of Intellectual Question in Achievement tests

10. Course structure

الاسبوع	التاريخ	الساعات	عناوين المواضيع الجانب العملي	عناوين المواضيع الجانب النظري	طريقة التدريس	طريقة التقييم
1st	19/2/2023	4	**Section 1: Introductions** • What you will learn in this course • Introduction to SQL • Cheat Sheet	**Module 1 – Introduction to EHR concepts and context** - Definition of an EHR - Features of an EHR System - Benefits of EHRs on Care	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
2nd	26/2/2023	4	**Section 2: Downloading Software** • Downloading SQL Server Management Studio (SSMS)	- EHR development and implementation - Components of an EHR System - Functions of an EHR System - Detailed Health Information and Data - Electronic Health Records vs.(EHR) Electronic Medical Records (EMR)	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
3rd	5/3/2023	4	**Section 3: Servers and Databases** • Connecting to server in SSMS • Creating Databases • Dropping Databases • Using Databases	- The Legal and regulatory context for EHRs - Legal Process and Electronic Health Record - The Legal and regulatory context for EHR	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
4th	12/3/2023	4	**Section 4: Creating and Inserting tables** • Table Structure • Data Types • Creating tables • Dropping Tables • Inserting Data	- Privacy and Confidentiality of Healthcare - History and trends in clinical information systems in the United States - Implications of EHR for healthcare in the US	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
5th	19/3/2023	4	- Tables with null values • Creating Tables with Primary	- Databases in Healthcare - Types Of Healthcare Data	blended learning	In **Achievement Tests** **Oral presentation** **Project** **Individual Skills**

			keys • If Object_ID			
6th	26/3/2023	4	**Section 5: Retrieving Data** • Select Statements o Top 100, Distinct • Where clause o And, Or, Not, Null, Not Null o Like, In, Between	**Module 2 – Supporting Technologies and Standards** - Real-World EHR models - Health Informatics Standards - Improving Electronic Health Records -	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
7th	2/4/2023	4	Common Wildcard Symbols • Order by and Group by • Aggregate Functions	**Module3 _Workflow/policy challenges in EHR implementation** - Collecting and sharing data for population health: A new paradigm - What Is Workflow? - Tools, Techniques, and Tips for Analyzing Workflow	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
8th	9/4/2023	4	- Alias names • Having • Case When	- Common Clinic Processes to Be Analyzed - An example: The Medication refill Process Before and After EHR -	blended learning	**Standard Tests1**
9th	16/4/2023	4	- Databases in Healthcare	- Databases in Healthcare	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
10th	23/4/2023	4	- Truncating Data • Select Into o With Conditions • Temporary Tables	- Schemas for Multidimensional Databases - Data Preprocessing	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
11th	30/4/2023	4	Section 7: Joining Tables • Primary Key Review • Relational Databases • One to One • One to Many	- **Module 4 – EHR and Quality of Care; Clinical Decision** - Improving Electronic Health Records - impact of health information technology on quality,	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**

			• Many to Many • Inner Join	efficiency, and costs of medical care -		
- 12th	- 7/5/2023	- 4	- • Left and Right Joins • Union	- Clinical Decision Support - A roadmap for national action on clinical decision support	blended learning	**Standard Tests2**
13th	14/5/2023	4	**Section 8: Other Functions** • Round, Cast, Convert, Format • Isnull, Nullif • Upper, Lower, Trim, Left, Right - • Inner queries, Constraints • Stored Procedures, Declaring Variable	- Database Technology in Healthcare - An overview of Managing change	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
- 14th	- 21/5/2023	- 4	**Section 9: Real-world practice using Healthcare Data** • Review in Excel • Review Entity Relationship Diagram • Upload data into SSMS • Introduction to Healthcare Finance	- Clinical Database Applications - Collecting and sharing data for population health: A new paradigm	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
15th	28/5/2023	4	**Section 10: Practice, Practice, Practice** This Section is chalk full of practice questions. You will practice writing SQL syntax with real-world questions.	- Clinical Data Warehouses - cloud-based EHR system	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
15th	4/6/2023	Final exam				

12. Infrastructure :	
I. Textbooks:.	• Carter, J.H. .*Electronic health record: A guide for clinicians and administrators.*Philadelphia: ACP Press. (ISBN 1930513976 9781930513976 • *Practice Management and EHR: A Total Patient Encounter for Medisoft Clinical, FirstEdition, Susan M. Sanderson*
II. References:	• Elmasri, R. and Shamkant, B. N., "Fundamentals of Database Systems", 5th Edition Addison-Wesley
III. Recommended reading: (Periodicals, Reports, …)	
IV. E-References, Websites, ….	https://www.udemy.com/course/data-analytics-intro-to-sql-using-healthcare-data-ssms

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

14. Course Development Plan

Constantly updating the course by adding some new titles and following up on developments in the field of health care systems, especially electronic health records.