Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Medical Administration

Department of .....

Course Specification of

Health Information System and Technology

Course No. (05.11.522)

2021/2022

I. Course Identification and General Information:

1	**Course Title:**	Health Information System and Technology			
2	**Course Code & Number:**	05.11.522			
3	**Credit Hours:**	**Credit Hours**	**Theory Hours**		**Lab. Hours**
			Lecture	**Exercise**	
		3	2	--	1
4	**Study Level/ Semester at which this Course is offered:**	1 Level / 1 Semester			
5	**Pre –Requisite (if any):**	Non			
6	**Co –Requisite (if any):**	Non			
7	**Program (s) in which the Course is Offered:**	Master of Science in Medical Administration			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Regular (semester)			
10	**Mode of Delivery:**	Full Time			
11	**Location of Teaching the Course:**	University Campus			
12	**Prepared by:**	Asst.prof Abdulrahman Mohammed Obaid			
13	**Date of Approval:**				

II. Course Description:

This course aims to provide students with the knowledge, cognitive, practical, and general skills in medical information technology and systems. The course deals with the computerization of registration systems in hospitals and clinics. This course focuses on health institutions' systems and information processing, modeling health information systems, engineering of hospital

information systems, and the quality of information systems. Health, strategic information management in healthcare networks

III. Course Intended Learning Outcomes (CILOs) : (مخرجات تعلم المقرر)		Referenced PILOs (مخرجات تعلم البرنامج)
A. Knowledge and Understanding: Upon successful completion of the course, students will be able to:		
a1	- Demonstrate knowledge and understanding of essential facts, concepts, theories and principles of computer technology in field of health services	A1
B. Intellectual Skills: Upon successful completion of the course, students will be able to:		
b1	Propose suitable appropriate techniques to minimizing the cost and maximizing the performance. when storing, processing and transmit in Computer practice in the health organizations and facilities .	**B2,B3**
b2	Evaluate the process of design and how problems with defective code can be resolved.	
C. Professional and Practical Skills: Upon successful completion of the course, students will be able to:		

c1	Implement software's to process design and how problems with defective code can be resolved in health services.	**C1 ,C2**
c2	Apply the Modeling of Health Information Systems to develop a solutions related to healthcare	
D. Transferable Skills: Upon successful completion of the course, students will be able to:		
d1	- Work effectively individually or with others to solve problems	**D1,D5**
d5	Write efficiently code, which ensures a perfect communication between staffs and health services.	

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:			
	Course Intended Learning Outcomes	**Teaching Strategies**	**Assessment Strategies**
a1	- Demonstrate knowledge and understanding of essential facts, concepts, theories and principles of computer technology in field of health services	▪ Interactive lectures ▪ Interactive Class Discussions, ▪ Exercises and Homeworks	▪ Written tests (mid and final terms exam) ▪ Home works and assignments, ▪ Presentations.

(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
b2	Propose suitable appropriate techniques to minimizing the cost and maximizing the performance. when storing, processing and transmit in Computer practice in the health organizations and facilities .	▪ Interactive lectures, ▪ Interactive Class Discussions, ▪ Brainstorming, ▪ Presentation ▪ Problem based Learning ▪ Directed Self-Study, ▪ Team work	▪ Written tests (mid and final terms exam) ▪ Technical Report ▪ Problem solving, ▪ Presentations.
	Evaluate the process of design and how problems with defective code can be resolved.	▪ Interactive lectures, ▪ Interactive Class Discussions, ▪ Brainstorming, ▪ Presentation ▪ Problem based Learning ▪ Directed Self-Study, ▪ Team work	▪ Written tests (mid and final terms exam) ▪ Technical Report ▪ Problem solving, ▪ Presentations.

(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Implement software's to process design and how problems with defective code can be resolved in health services.	▪ Interactive lectures, ▪ Illustrations, ▪ Interactive Class Discussions, ▪ Presentation ▪ Exercises and Homeworks, ▪ Problem based Learning ▪ Directed Self-Study, ▪ Team work	▪ Written tests (mid and final terms exam) ▪ Technical Report ▪ Home works and assignments, ▪ Problem solving, ▪ Presentations.
c2	Apply the Modeling of Health Information Systems to develop a solutions related to healthcare	▪ Interactive lectures, ▪ Illustrations, ▪ Interactive Class Discussions,	▪ Written tests (mid and final terms exam) ▪ Technical Report ▪ Home works and assignments,

		▪ Presentation ▪ Exercises and Homeworks, ▪ Problem based Learning ▪ Directed Self-Study, ▪ Team work	▪ Problem solving, ▪ Presentations.

(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:

Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
d1	- Work effectively individually or with others to solve problems	▪ Presentation ▪ Exercises and Homeworks, ▪ Team work	▪ Technical Report ▪ Home works and assignments, ▪ Problem solving, ▪ Presentations.
d5	Write efficiently code, which ensures a perfect communication between staffs and health services.	▪ Presentation ▪ Exercises and Homeworks, ▪ Team work	▪ Technical Report ▪ Home works and assignments, ▪ Problem solving, ▪ Presentations.

IV. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	**Introduction**	– Introduction	1	2	a1
2	**Health Institutions and Information Processing**	– Significance of Information Processing in Health Care – Progress in Information and Communication Technology – Importance of Systematic Information Management	1	2	a1
3	**Information System Basics**	– Data, Information, and Knowledge	1	2	a1, b2, c1,d1

		– Information Systems and Their Components – Information Management.			
4	**Health Information Systems**	– Introduction – Hospital Information Systems – Transinstitutional Health Information Systems – Electronic Health Records as a Part of Health Information Systems – Challenges for Health Information Systems	2	4	a1, b2, c1, c2, d1
5	**Mid-Term Theoretical Exam**	– Mid-Term Theoretical Exam	1	2	a1, b2, c1, c2, d1
6	**Modeling Health Information Systems**	– Introduction – On Models and Metamodels – A Metamodel for Modeling Health Information Systems on Three Layers: 3LGM – On Reference Models – A Reference Model for the Domain Layer of Hospital Information Systems....	2	4	a1, b2, b3, c1, c2, d1
7	**Architecture of Hospital Information Systems**	– Introduction – Domain Layer: Data to be Processed in Hospitals – Domain Layer: Hospital Functions – Logical Tool Layer: Application Components – Logical Tool Layer: Integration of Application Components	2	4	a1, b2, b3, c1, c2, d1

		– Physical Tool Layer: Physical Data-Processing Systems			
8	**Specific Aspects for Architectures of Transinstitutional Health Information Systems**	– Introduction – Domain Layer – Logical Tool Layer – Physical Tool Layer	1	2	a1, b2, c1, c2, b3, d1
9	**Quality of Health Information Systems**	– Introduction – Quality of Structures – Quality of Processes – Quality of Outcome – Balance as a Challenge for Information Management – Evaluation of Health Information Systems Quality	1	2	a1, b2, b3, c1, c2, d1
10	**Strategic Information Management in Hospitals**	– Introduction – Strategic, Tactical and Operational Information Management – Organizational Structures of Information Management – Strategic Planning – Strategic Monitoring – Strategic Directing	2	4	a1, b2, b3, c1, c2, d1
11	**Strategic Information Management in Health Care Networks**	– Introduction – Description of Health Care Networks – Organizational Structures of Information Management – Types of Health Care Networks	1	2	a1, b2, b3, c1, c2, d1,d2

12	**Final Theoretical Exam**	– Final Theoretical Exam	1	2	a1, b2, b3, c1,c2, d1
Number of Weeks /and Units Per Semester			**16**	**32**	

B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	- **introduction of Access Basics and Database**	1	2	a1
2	- **Design and Build a Database**	1	2	a1, b2, b3, c1, d1, d5
3	- **Relationship Basics**	1	2	a1, b2, b3 c1, d1, d5
4	- **Entity Relationship (ER) Diagram**	1	2	a1, b2, b3, c1, d1, d5
5	- **Normalization forms**	2	4	a1, b2, b3, c1, d1, d5
6	- **Mid-Term Practical Exam**	1	2	a1, b2, b3, c1, c2, d1, d5
7	- **SQL Language**	2	4	a1, b2, b3, c1, d1, d5
8	- **Query Builder in Access**	2	4	a1, b2, b3, c1, d1, d5
9	- **Work With Reports**	1	2	a1, b2, b3, c1, d1, d5

10	- **Access with Other Applications**	1	2	a1, b2, b3, c1, d1, d5
11	- **Manage an Access Database**	1	2	a1, b2, b3, c1, d1, d5
12	- **Final-Term Practical Exam**	1	2	a1, b2, b3, c1, c2, d1, d5
Number of Weeks /and Units Per Semester		**15**	**30**	

V. Teaching Strategies of the Course:

- Lectures/Interactive lectures,,
- Discussion/Interactive Class Discussions,
- Brainstorming,
- Seminar/ Project/ Presentation
- Exercises and Homeworks,
- Problem based Learning
- Directed Self-Study,
- Team work

VI. Assessment Methods of the Course:

- Written tests (mid and final terms exam)
- Technical Report
- Home works and assignments,
- Quizzes
- Problem solving,
- Presentations.

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)

1	**Exercises and Home Works**	3	3	a1, b2, b3, c1, d1
2	**Technical Report.**	11	7	a1, b2, b3, c1, c2, d, d5
Total			**10**	

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Assignments**	3 ,11	10	10 %	a1, b2, b3, c1, c2, d1, d5
2	**Quizzes 1 & 2**	6,12	5	5 %	a1, b2, c1, c2
3	**Mid-Term Theoretical Exam**	8	10	10 %	a1, b2, c1, c2, d1
4	**Mid-Term Practical Exam**	7	5	5 %	a1, b2, b3, c1, c2, d1, d5
5	**Final Practical Exam including Project Presentation & Evaluation**	15	10	10 %	a1, b2, b3, c1, c2, d1, d5
6	**Final Theoretical Exam**	16	60	60 %	a1, b2, b3, c1,c2, d1
Total			**100**	**100 %**	

IX. Learning Resources:

- *Written in the following order:* Author, Year of publication, **Title**, Edition, Place of publication, Publisher.

1- Required Textbook(s) (maximum two): مثال example

1- A Winter, R Haux, E Ammenwerth, B Brigl, N Hellrung, F Jahn, 2011, **Health Information Systems Architectures and Strategies**, 2nd Edition, USA, Springer

2- Karen A. Wager, Frances W. Lee, John P. Glaser,2017, **Health Care Information Systems: A Practical Approach for Health Care Management,** 4th Edition, USA, Jossey-Bass

2- Essential References:
1- J. A. Magnuson , Jr. Paul Fu , 2014, **Public Health Informatics and Information**, Systems 2nd Edition, USA, Springer.
3- Electronic Materials and Web Sites etc.:
Websites: 1- https://vdoc.pub/download/health-information-systems-architectures-and-strategies-382pccilu8tg **Journals:** 1- **Other Web Sources:** 1- https://ebin.pub/healthcare-information-systems-4nbsped-9781119337188-1119337186.html 2- https://www.afro.who.int/sites/default/files/2017-06/AHO_Country_H_Infos_Systems_2nd_edition.pdf

X. Course Policies: (Based on the Uniform Students' By law (2007) تترك كما هي

1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:**

	Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

Second Part of Course Specification

Faculty of Medicine & Health Sciences

Department of ……..

Course Plan (Syllabus) of Health Information System and Technology

Course No. (05.11.522) **2021/2022**

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member:	**Asst.prof. Abdulrahman Mohammed Obaid**						
Location& Telephone No.:	**00967773574322**						
E-mail:	**Obaid.eng@gmail.com**	SAT	SUN	MON	TUE	WED	THU
Office Hours							

I. Course Identification and General Information:					
	Course Title:	Health Information System and Technology			
2	**Course Code & Number:**	05.11.522			
3	**Credit Hours:**	**Credit Hours**	**Theory Hours**		**Lab. Hours**
			Lecture	**Exercise**	
		3	2	--	1
4	**Study Level/ Semester at which this Course is offered:**	1 Level / 1 Semester			
5	**Pre –Requisite (if any):**	Non			
6	**Co –Requisite (if any):**	Non			
7	**Program (s) in which the Course is Offered:**	Master of Science in Medical Administration			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Regular (semester)			
10	**Mode of Delivery:**	Full Time			
11	**Location of Teaching the Course:**	University Campus			

II. Course Description:

This course aims to provide students with the knowledge, cognitive, practical, and general skills in medical information technology and systems. The course deals with the computerization of registration systems in hospitals and clinics. This course focuses on health institutions' systems and information processing, modeling health information systems, engineering of hospital information systems, and the quality of information systems. Health, strategic information management in healthcare networks

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B. Intellectual Skills: Upon successful completion of the course, students will be able to:	
b1	Propose suitable appropriate techniques to minimizing the cost and maximizing the performance. when storing, processing and transmit in Computer practice in the health organizations and facilities .
b2	Evaluate the process of design and how problems with defective code can be resolved.
C. Professional and Practical Skills: Upon successful completion of the course, students will be able to:	
c1	Implement software's to process design and how problems with defective code can be resolved in health services.
c2	Apply the Modeling of Health Information Systems to develop a solutions related to healthcare
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d1	- Work effectively individually or with others to solve problems
d2	Write efficiently code, which ensures a perfect communication between staffs and health services.

IV. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	**Introduction**	– Introduction	1	2	a1
2	**Health Institutions and Information Processing**	– Significance of Information Processing in Health Care – Progress in Information and Communication Technology – Importance of Systematic Information Management	1	2	a1
3	**Information System Basics**	– Data, Information, and Knowledge – Information Systems and Their Components – Information Management.	1	2	a1, b2, c1,d1
4	**Health Information Systems**	– Introduction – Hospital Information Systems – Transinstitutional Health Information Systems – Electronic Health Records as a Part of Health Information Systems – Challenges for Health Information Systems	2	4	a1, b2, c1, c2, d1
5	**Mid-Term Theoretical Exam**	– Mid-Term Theoretical Exam	1	2	a1, b2, c1, c2, d1
6	**Modeling Health Information Systems**	– Introduction – On Models and Metamodels – A Metamodel for Modeling Health Information Systems on Three Layers: 3LGM – On Reference Models	2	4	a1, b2, b3, c1, c2, d1

		– A Reference Model for the Domain Layer of Hospital Information Systems....			
7	**Architecture of Hospital Information Systems**	– Introduction – Domain Layer: Data to be Processed in Hospitals – Domain Layer: Hospital Functions – Logical Tool Layer: Application Components – Logical Tool Layer: Integration of Application Components – Physical Tool Layer: Physical Data-Processing Systems	2	4	a1, b2, b3, c1, c2, d1
8	**Specific Aspects for Architectures of Transinstitutional Health Information Systems**	– Introduction – Domain Layer – Logical Tool Layer – Physical Tool Layer	1	2	a1, b2, c1, c2, b3, d1
9	**Quality of Health Information Systems**	– Introduction – Quality of Structures – Quality of Processes – Quality of Outcome – Balance as a Challenge for Information Management – Evaluation of Health Information Systems Quality	1	2	a1, b2, b3, c1, c2, d1
10	**Strategic Information Management in Hospitals**	– Introduction – Strategic, Tactical and Operational Information Management	2	4	a1, b2, b3, c1, c2, d1

		– Organizational Structures of Information Management – Strategic Planning – Strategic Monitoring – Strategic Directing			
11	**Strategic Information Management in Health Care Networks**	– Introduction – Description of Health Care Networks – Organizational Structures of Information Management – Types of Health Care Networks	1	2	a1, b2, b3, c1, c2, d1,d2
12	**Final Theoretical Exam**	– Final Theoretical Exam	1	2	a1, b2, b3, c1,c2, d1
Number of Weeks /and Units Per Semester			**16**	**32**	

B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	- **introduction of Access Basics and Database**	1	2	a1
2	- **Design and Build a Database**	1	2	a1, b2, b3, c1, d1, d5
3	- **Relationship Basics**	1	2	a1, b2, b3 c1, d1, d5
4	- **Entity Relationship (ER) Diagram**	1	2	a1, b2, b3, c1, d1, d5
5	- **Normalization forms**	2	4	a1, b2, b3, c1, d1, d5

6	- **Mid-Term Practical Exam**	1	2	a1, b2, b3, c1, c2, d1, d5
7	- **SQL Language**	2	4	a1, b2, b3, c1, d1, d5
8	- **Query Builder in Access**	2	4	a1, b2, b3, c1, d1, d5
9	- **Work With Reports**	1	2	a1, b2, b3, c1, d1, d5
10	- **Access with Other Applications**	1	2	a1, b2, b3, c1, d1, d5
11	- **Manage an Access Database**	1	2	a1, b2, b3, c1, d1, d5
12	- **Final-Term Practical Exam**	1	2	a1, b2, b3, c1, c2, d1, d5
Number of Weeks /and Units Per Semester		**15**	**30**	

V. Teaching Strategies of the Course:

- Lectures/Interactive lectures,,
- Discussion/Interactive Class Discussions,
- Brainstorming,
- Seminar/ Project/ Presentation
- Exercises and Homeworks,
- Problem based Learning
- Directed Self-Study,
- Team work

VI. Assessment Methods of the Course:

- Written tests (mid and final terms exam)
- Technical Report
- Home works and assignments,
- Quizzes
- Problem solving,
- Presentations.

VII. Assignments:

No.	Assignments	Week Due	Mark
1	**Exercises and Home Works**	3	3
2	**Technical Report.**	11	7
Total			**10**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	**Assignments**	3 ,11	10	10 %
2	**Quizzes 1 & 2**	6,12	5	5 %
3	**Mid-Term Theoretical Exam**	8	10	10 %
4	**Mid-Term Practical Exam**	7	5	5 %
5	**Final Practical Exam including Project Presentation & Evaluation**	15	10	10 %
6	**Final Theoretical Exam**	16	60	60 %
Total			**100**	**100 %**

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Websites:

2- https://vdoc.pub/download/health-information-systems-architectures-and-strategies-382pccilu8tg

Journals:

1-

Other Web Sources:

1- https://ebin.pub/healthcare-information-systems-4nbsped-9781119337188-1119337186.html

2- https://www.afro.who.int/sites/default/files/2017-06/AHO_Country_H_Infos_Systems_2nd_edition.pdf

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7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.