Form: **Course Syllabus**	**Form Number**	
	Issue Number and Date	2/3/24/2022/2963 5/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	
	The Date of the Deans Council Approval Decision	
	Number of Pages	01

1.	**Course title**	Healthcare and Medical Data Analytics	
2.	**Course number**	1915352	
3.	**Credit hours**	3 (theory, practical)	3 (theory, practical)
	Contact hours (theory, practical)	3 (theory, practical)	
4.	**Prerequisites/corequisites**	Data Mining	
5.	**Program title**	B.Sc. in	
6.	**Program code**	15	
7.	**Awarding institution**	The University of Jordan	
8.	**School**	King Abdullah II School of Information Technology	
9.	**Department**	Artificial Intelligence	
10.	**Course level**	Third Year	
11.	**Year of study and semester (s)**	2023/2024, Fall	
12.	**Other department (s) involved in teaching the course**	/	
13.	**Main teaching language**	English	
14.	**Delivery method**	☑*Face to face learning* ☐Blended ☐Fully online	
15.	**Online platforms(s)**	☐*Moodle* ☐*Microsoft Teams* ☐Skype ☐Zoom ☐Others…………	
16.	**Issuing/Revision Date**		

17. Course Coordinator:

Name: **Dr. Heba Saadeh**	Contact hours: Sundays and Tuesday (11:30 – 12:30)
Office number: 327	Phone number: 5355000
Email: heba.saadeh@ju.edu.jo	

18. Other instructors:

/

19. Course Description:

As stated in the approved study plan.

This course introduces the characteristics of medical data and associated data mining challenges on dealing with such data. It focuses on studying those data science techniques in the context of concrete healthcare analytic applications such as predictive modelling, computational phenotyping and patient similarity, diseases detection. In this course, the students will learn how can the application of data analytics improve health and health care and how the data analytics-based solutions can result in better diagnosis, and better care. In healthcare, large amounts of heterogeneous medical data have become available in various healthcare organizations (payers, providers, pharmaceuticals). This data could be an enabling resource for deriving insights for improving care delivery and reducing waste. The enormity and complexity of these datasets present great challenges in analyses and subsequent applications to a practical clinical environment. The basics of data mining within the context of a wide variety of health care settings, and the types of data and data analysis challenges that you will likely encounter by gathering the data, move on to classifying, analyzing and finally visualizing medical data. The course will host a number of experts in the field of IT operations and related healthcare sector from the local market to cover the practical side of the course and share their first-hand experience with students.

20. Course aims and outcomes:

A- Aims:

The main goal of this course is to provide concepts about medical data analytics, and its practical application in the healthcare filed.

B- Students Learning Outcomes (SOs):

Upon successful completion of this course, students will be able to:

- **(SO1)**: Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- **(SO2)**: Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- **(SO5)**: Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

C- Intended Learning Outcomes (ILOs):
Successful completion of this module should lead to the following learning outcomes:
[Level Descriptor: Knowledge]

A. Knowledge and understanding: Students should:

A1) Understand basic concepts of Data Engineering and handling the missing values.

A2) Understand the basics of research.

A3) Understand the basics of Molecular Biology.

A4) Understand the concepts of Omics datasets.

A5) Understand the usage of omics databases and tools.

A6) Understand the usage and implement basic Clustering technique.

A7) Understand the usage and implement basic Classification technique.

[Level Descriptor: Skills]

B. Intellectual skills: with the ability to

B1) Apply Clustering techniques.

B2) Apply Classification techniques.

[Level Descriptor: Skills]

C. Subject specific skills: with ability to

C1) Build a model for RNA-Seq experiment.

C2) Apply clustering and classification techniques on medical datasets

D. Transferable skills: with ability to

D1) Prepare a presentation about one topic of either COVID-19 or NGS series.

Program SOs / ILOs of the course	SO (1)	SO (2)	SO (5)
A1	√		
A2	√		
A3	√		
A4	√		
A5	√		
A6	√	√	
A7	√	√	
B1	√	√	√
B2		√	√
C1	√	√	√
C2	√	√	√
D1	√	√	√

21. Topic Outline and Schedule (for Sun. Tue. and Thur. lectures):

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Data Engineering Review	A1, B1	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	1.2	Data Engineering Review		Blended	In the lab / e-learning	Synchronous		
2	2.1	Data Engineering Review	A1, B1	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	2.2	Data Engineering Review		Blended	In the lab / e-learning	Synchronous		
3	3.1	Missing values handling	A1, B2	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	3.2	Missing values handling		Blended	In the lab / e-learning	Synchronous		
4	4.1	Practical	A1, B1, B2	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	4.2	Practical		Blended	In the lab / e-learning	Synchronous		
5	5.1	Research foundation	A2	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	5.2	Research foundation		Blended	In the lab / e-learning	Synchronous		
6	6.1	Molecular Biology Foundation	A3	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	6.2	Molecular Biology Foundation		Blended	In the lab / e-learning	Synchronous		
7	7.1	Molecular Biology Foundation	A3	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	7.2	Molecular Biology Foundation		Blended	In the lab / e-learning	Synchronous		
8	8.1	Omics Datasets	A4	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	8.2	Omics Datasets		Blended	In the lab / e-learning	Synchronous		
9	9.1	Omics Databases and Tools	A5	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	9.2	Omics Databases and Tools		Blended	In the lab / e-learning	Synchronous		
10	10.1	Biological Data Design	A3-A5	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	10.2	Biological Data Design		Blended	In the lab / e-learning	Synchronous		
11	11.1	Midterm Exam	A1-A5	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	11.2	/		Blended	In the lab / e-learning	Synchronous		
12	12.1	RNA-Seq Analysis	C1	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	12.2	RNA-Seq Analysis	C1	Blended	In the lab / e-learning	Synchronous		Material on e-learning
13	13.1	Clustering Review	A6, A7, C2	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	13.2	Classification Review		Blended	In the lab / e-learning	Synchronous		
14	14.1	Presentation	A, D1	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning
	14.2	Presentation		Blended	In the lab / e-learning	Synchronous		
15	15.1	Presentation	A, D1, C2	Blended	In the lab / e-learning	Synchronous	In class questions	Material on e-learning

15.2	Practical		Blended	In the lab / e-learning	Synchronous		
16	**Final Exam**						

22. Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Midterm Exam	30	In weeks 1-10	A1 – A5	Week 10	Paper-based
Presentation	10	Different topics	A, D1	Week 14	/
Practical Assignment	10	Clustering and Classification	A6, A7, C2	Week 15	Practical
Final Exam	50	All the material	A, B, C, D	Week 16	JUExam

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):

1. Personal computers in labs.

2. Data show.

24 Course Policies:

A- Attendance policies:

Maximum allowable absence 15% of number of lectures per semester.

B- Absences from exams and submitting assignments on time:

Students are expected are expected to completely adhere to the assignment's strict deadlines, absolutely no exceptions are given. It's student's responsibility to inform his instructor about his absence from any exam during period not exceeding 3 days.

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Students' cheating, plagiarism and misbehavior will be transformed to special committee.

E- Grading policy:

Midterm exam (Practical: 30 marks), Unified Quizzes (Practical: 30 marks), Final exam (paper-based: 40 marks). This scale is for guidance only, it may or may not be appropriate for this term performance and therefore, it may change…

0 - 40	F
41 – 49	D-
50 – 53	D
54 – 57	D+
58 – 61	C-
62 - 66	C
67 – 70	C+
71 – 75	B-
76 – 79	B
80 – 84	B+
85 – 89	A-
90 - 100	A

F- Available university services that support achievement in the course:

Equipped Computer labs.

25 References:

A- Required book(s), assigned reading and audio-visuals:
All the material on the e-learning
B- Recommended books, materials, and media:
/

26. Additional information:

For more details on university regulations please visit http://www.ju.edu.jo/rules/index.htm
Students with special needs describe their needs to their instructors within the first two weeks of classes in order to secure their needs. If students with special needs fail to communicate their requirements to their instructors soon enough, their instructors may not be able to secure their requirements in a timely fashion.

Name of Course Coordinator: **Dr. Heba Saadeh**   Signature: ------------------ Date: **Oct 2023**

Head of Curriculum Committee/Department: **Dr. Heba Saadeh**   Signature: ------------------

Head of Department: --Signature: ------------------

Head of Curriculum Committee/Faculty: ----------------------Signature: ------------------

Dean: ---Signature: ------------------