



Course Specifications

Course Title:	Biomedical Informatics
Course Code:	513PMAI-3
Program:	Professional Master of Artificial Intelligence
Department:	Computer Science
College:	Collage of Computer Science and Information Systems
Institution:	Najran University

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A. Course Identification

1. Credit hours:
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input type="checkbox"/> Elective <input checked="" type="checkbox"/>
3. Level/year at which this course is offered: Year 2/ Level 6
4. Pre-requisites for this course (if any):
Machine Learning & Deep Learning
5. Co-requisites for this course (if any):

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	50	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	20
3	Tutorial	
4	Others (specify)	
	Total	50

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces the unique characteristics of clinical and life science data and the methods for representation and transformation of biomedical data, information, and knowledge to improve human health. The course will provide an overview of basic concepts and will serve as a Launchpad into other more focused courses that explore the computational and analytics needs of BMI, as well as the clinical, research and translational applications of informatics.

2. Course Main Objective

After successful completion of this course students should be able to:

- Principles of informatics and data science, as used across the spectrum of biomedicine and health.
- Implement analytic techniques and models for analysis of data
- Apply programming skills to analyze data and develop simulation studies
- Evaluate the use of analytic methods in public health and biomedicine
- Build productive collaborations across public health and biomedicine

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Describe the principles of informatics and data science, as used across the spectrum of biomedicine and health	K1, K2
1.2		
1.3		
1...		
2	Skills :	
2.1	Implement analytic techniques and models for analysis of data	S1, S2, S3
2.2	Apply programming skills to analyze data and develop simulation studies	S1, S2, S3
2.3	Evaluate the use of analytic methods in public health and biomedicine	S1, S2, S3
2...	Build productive collaborations across public health and biomedicine	
3	Values:	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	The Science and Pragmatics of Biomedical Informatics	8
2	Biomedical Data and Decision Making	10
3	Methodologies in Biomedical Informatics	7
4	Bioinformatics and Translational Bioinformatics	7
5	Biomedical Imaging Informatics	5
6	Clinical Informatics and Electronic Health Record Systems	8
7	Clinical Research Informatics	4
8	Public Health Informatics	6
9	Ethics in Biomedical and Health Informatics: Users, Standards, and Outcomes	5
Total		50

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Describe the principles of informatics and data science, as used across the spectrum of biomedicine and health	TS-1: Relate Course Learning Outcomes (CLOs) to the topics	Assignment, Midterm Exam and Project presentation
1.2		TS-2: Lectures: using PPT presentation and other software to address verbally in front of students the concepts associated with examples with taking help of writing on the board as needed.	
...		TS-3: Communication: Given to students the main requirements of the project's reports and presentation	
		TS-4: Encourage students to read different journals, seminars or websites at their leisure time to have better understanding about biomedicine and health.	
		TS-5: Recall the topics of last lecture and the critical issues based on different topics, which certainly helps students to recall memory frequently and store that topic in their memory for long term	
2.0	Skills		
2.1	Implement analytic techniques and models for analysis of data	TS-1: Relate Course Learning Outcomes (CLOs) to the topics	Assignment, Midterm Exam, Lab Assessment
2.2	Apply programming skills to analyze data and develop simulation studies	TS-2: Lectures: using PPT presentation and other software to address verbally in front of students the concepts	
2.3	Evaluate the use of analytic methods in public health and biomedicine		
2.4	Build productive collaborations across public health and biomedicine		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		<p>associated with examples with taking help of writing on the board as needed.</p> <p>TS-3: LAB Work: Every student in the lab is using a separate PC. Practically showing them how to create a small programming and analyze data and develop simulation studies.</p> <p>TS-4: Tutorial: In the tutorials, we ask students to solve some problems in front of each other's and give them some comments and the right answers.</p> <p>TS-5: Communication: Given to students the main requirements of the project's reports and presentation</p> <p>TS-6: Recall the topics of last lecture and the critical issues based on different topics, which certainly helps students to recall memory frequently and store that topic in their memory for long term.</p>	
3.0	Values		
3.1			
3.2			
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Project, presentation and Quiz	Week 4,11 and 10	10%
2	Midterm Exam	6 th week	20%
4	Lab Activity	Weeks1-10	10%
5	Lab Assessment 1	Week 10 th	10%
6	Final Lab Exam	11 th week	10%
7	Final Theory Exam	12 th or 13 th	40%
8	Total		100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each faculty member should set up to 10 hours weekly as office hours in their time tables.
- Academic advisors are assigned to advice and support students.
- Instructors set specific office hours for each course he is teaching. The teaching load of staff members are available in the front of their offices.
- Instructors arrange and provide tutorials to students.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Sarkar, Indra Neil (Ed.). <i>Methods in Biomedical Informatics</i> . Academic Press (2014). ISBN: 9780124016781
Essential References Materials	Shortliffe, E. H., & Cimino, J. J. (2021). <i>Biomedical Informatics: Computer Applications in Health Care and Biomedicine</i> .
Electronic Materials	
Other Learning Materials	N/A

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> • Lecture Rooms with appropriate number of seats, Projector with Screen and a white board or a smart board. • All the computers in all the laboratories should be installed with the latest version of the required software.
Technology Resources (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> • One PC and one projector and data show in the lecture room • Number of PCs according to strength of students in the lab room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Student	Online course survey: By the end of each semester, students give their opinions about many factors in the course. They give feedback about the teaching strategies, assessment methods, textbooks, instructor, etc.
Effectiveness of Teaching	Student	Feedback about Course Learning Outcomes (CLOs): A course survey is distributed to students to take their opinions about the CLOs.
Assessment	Course coordinator	Checks all exams and make sure that they are related to CLOs and appropriate for the course

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Science Departmental Council
Reference No.	14440203-0185-00002
Date	1st Sep, 2022