CO 3	✓		✓	✓
CO 4	✓	✓	✓	✓

14. HEALTH DATA ANALYTICS

Discipline	COMPUTER SCIENCE				
Course Code	UK3DSCCSC213				
Course Title	HEALTH DATA ANALYTICS				
Type of Course	DSC				
Semester	III				
Academic Level	2				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	4	3 hours	-	2 hours	5 hours
Pre-requisites	Nil				
Course Summary	This course deals with concepts of Data analytics in Healthcare. It introduces the student to the technologies and concepts used in this area.				

Detailed Syllabus:

Module	Unit	Content	Hrs (L+P)
I		**Fundamentals**	15
	1	Healthcare Transformation—Challenges and Opportunities	
	2	The Current State of Healthcare Costs and Quality	
	3	Fundamentals of Healthcare Analytics: How Analytics Can Improve Decision Making	
	4	Analytics, Quality, and Performance	
	5	Applications of Healthcare Analytics, Components of Healthcare Analytics	

II		**Analytics Strategy**	**15**
	6	Purpose of an Analytics Strategy	
	7	Analytics Strategy Framework, with a Focus on Quality/Performance Improvement	
	8	Developing an Analytics Strategy	
	9	Defining Healthcare Quality and Value : Quality, Overview of Healthcare QI, Common QI Frameworks in Healthcare, Working with QI Methodologies	
III		**Data Quality and Governance**	**15**
	10	Introduction,The Need for Effective Data Management	
	11	Data Quality, Data Governance and Management	
	12	Enterprise-wide Visibility and Opportunity	
	13	Working with Data: Data::-The Raw Material of Analytics	
	14	Preparing Data for Analytics, Getting Started with Analyzing Data	
	15	Developing and Using Effective Indicators: Measures, Metrics, and Indicators	
	16	Using Indicators to Guide Healthcare Improvement Activities	
	17	Presentation and Visualization of Information	
IV		**Advanced Analytics in Healthcare**	**15**
	18	Overview of Advanced Analytics, Applications of Advanced Analytics	
	19	Developing and Testing Advanced Analytics	
	20	Overview of Predictive Algorithms	
	21	Becoming an Analytical Healthcare Organization: Requirements to Become an Analytical Organization, Building Effective Analytical Teams	
V		**Flexi Module: Not included for End Semester Exams**	**15**
	22	Machine learning algorithms for healthcare data analytics	
	23	Data analytics in Healthcare recommendation systems.	

References

Core Textbook

1. Trevor. L. Storm, "Healthcare Analytics for Quality and Performance Improvement", WILEY Publishers, 2013.

Additional

2. Hui Yang and Eva K. Lee, "Healthcare Analytics: From Data to Knowledge to Healthcare Improvement", WILEY Publishers.
3. Chandan K. Reddy and Charu C. Aggarwal, "Healthcare Data Analytics", CRC Press, Taylor & Francis Group.

Lab Exercises

1. Clean and preprocess healthcare datasets to ensure data quality and integrity for analysis.
2. Explore descriptive analytics techniques to understand healthcare trends, patient demographics, and service utilization patterns.
3. Utilize predictive modeling to forecast patient readmissions, disease progression, or healthcare resource demands.
4. Implement clustering algorithms to segment patient populations based on healthcare needs and preferences for targeted interventions.
5. Implement Machine Learning algorithms in healthcare datasets.

Course Outcomes

No.	Upon completion of the course the graduate will be able to	Cognitive Level	PSO addressed
CO-1	Restate healthcare analytics to improve decision-making and address challenges in healthcare transformation effectively.	U	PSO-1,2
CO-2	Develop strategies for enhancing healthcare quality, performance, and value through data-driven decision-making processes.	Ap	PSO-1,2,3
CO-3	Establish data governance frameworks to ensure data quality and integrity for informed decision-making in healthcare.	Ap	PSO-1,2,3
CO-4	Implement advanced analytics techniques to predict healthcare outcomes and optimize resource allocation effectively.	Ap	PSO-1,2,3

R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create

Note: 1 or 2 COs/module

Name of the Course: HEALTH DATA ANALYTICS

Credits: 3:0:2 (Lecture: Tutorial: Practical)

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/Tutorial (T)	Practical (P)
CO-1	Summarize about Telemedicine	PO-6,7 PSO-1,2	U	F, C	T	
CO-2	Explain about Telemedicine Systems	PO-5, 6,7 PSO-1,2,3	Ap	F, C,P	T	P
CO-3	Describe about platforms necessary for Telemedicine	PO-5, 6,7 PSO-1,2,3	Ap	F, C,P	T	P
CO-4	Explain about Medical Transcription	PO-5, 6,7 PSO-1,2,3	Ap	F, C, P, M	T	P

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

Mapping of COs with PSOs and POs :

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3	PSO 4	
CO 1	-	-	-	--	1	2	2	-	2	2	-	-	-
CO 2	-	-	-		1	2	2	--	2	2	2	-	-
CO 3	-	-		-	1	2	2	-	2	2	3	-	-
CO 4	-	-	-	--	1	2	2	-	2	2	3		-

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

Mapping of COs to Assessment Rubrics :

	Internal Exam	Assignment	Quiz/ Seminar	End Semester Examinations
CO 1	✓		✓	✓
CO 2	✓		✓	✓
CO 3	✓			✓
CO 4		✓		✓

DSE

1. INTRODUCTION TO CYBER SECURITY (Stream: Cyber Security)

Discipline	COMPUTER SCIENCE
Course Code	UK3DSECSC200
Course Title	**INTRODUCTION TO CYBER SECURITY**
Type of Course	DSE
Semester	III
Academic Level	2
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week