Course Syllabus/Specification

Course Specification

The course of Big Data analysis in Healthcare provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Teaching Institution	**University of Al-Mustaqbal college of Science**
2. Department / Center	**Intelligent Medical Systems Department**
3. Course Title /Code	**Big Data Analysis in Healthcare MU03024106**
4. Modes of Attendance Offered	**Theoretical and Practical**
5. Semester/Year	**Semester 1/2025**
6. Number of Hours Tuition (Total)	**60 Hours**
7. Date of Production of this Specification	**1/9/2025**
8. Course Description	This course can be the definitive resource for persons working in this field as researchers, scientists, programmers, engineers, and users. The course is intended for preparing students to be able dealing with value, variety, validity, velocity, veracity, and the huge volume of data.

9. Aims of the Course

The course objective is to understand healthcare systems, ethical and legal healthcare issues, management functions, leadership styles, and healthcare marketing concepts.

Upon completion of the module, you will be able to:

- Describe the concepts and theories of healthcare management system
- Demonstrate new skills through the use of materials, tools, and/or technology that are central to healthcare management.
- Interpret and explain significant laws and ethics of healthcare management and delivery.
- Students explore health care systems in both developed and developing countries

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

A. Knowledge and Understanding

The students will be able to:

- Identify Big Data and its Business Implications.
- List the components of Hadoop and Hadoop Eco-System
- Access and Process Data on Distributed File System
- Manage Job Execution in Hadoop Environment
- Develop Big Data Solutions using Hadoop Eco System
- Analyze Infosphere BigInsights Big Data Recommendations.
- Apply Machine Learning Techniques using R.

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 a foundational understanding of health systems administration, equipping future leaders with the knowledge needed to navigate this dynamic field. This course provides the students the ability to:

- Describe the concepts and models of Big Data Analysis in Healthcare.
- Demonstrate new skills through the use of materials, tools, and/or technology that are central to Big Data Analysis in Healthcare

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

الاسبوع	التاريخ	الساعات	عناوين المواضيع الجانب النظري	طريقة التدريس	طريقة التقييم
1st	19/9/2024	2	➢ **INTRODUCTION TO Big Data**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
2nd	26/9/2024	2	➢ **INTRODUCTION TO HADOOP**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
3rd	3/9/2024	2	➢ **HDFS (Hadoop Distributed File System)**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
4th	10/10/2024	2	➢ **Map Reduce**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
5th	17/10/2024	2	➢ **Map Reduce**	blended learning	In **Achievement Tests** **Oral presentation** **Project** **Individual Skills**
6th	24/10/2024	2	➢ Midterm Exam	blended learning	**Standard Tests1**
7th	31/10/2024	2	➢ **Hadoop Eco System**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
8th	7/11/2024	2	➢ **Hadoop Eco System - Pig**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
9th	14/11/2024	2	➢ **Hadoop Eco System - Hive .**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
10th	21/11/2024	2	➢ **Hadoop Eco System - Hbase.**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
11th	28/11/2024	2	➢ **Hadoop Eco System - Big SQL .**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
12th	5/12/2024	2	➢ **Hadoop Eco System - Big SQL .**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**

13th	12/12/2024	2	➢ **Data Analytic with R**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
14th	19/12/2024	2	➢ **Data Analytic with R**	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
15th	26/12/2024	2	➢ Precreation for the final exam	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**

الاسبوع	التاريخ	الساعات	عناوين المواضيع الجانب العملي	طريقة التدريس	طريقة التقييم
1st	18/9/2024	2	Data Collection: ➢ Twitter API / Twitter Data Collection Workshop ➢ CrowdTangle ➢ Make Twitter Location Search Easy with Pam's Pin -- Convert a street address to a location-based Twitter search.	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
2nd	25/9/2024	2	Data Storage and Retrieval: ➢ CIRCE Tutorial ➢ Research Computing	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
3rd	2/9/2024	2	Data Manipulation / Cleaning ➢ tidyverse ➢ data.tables	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
4th	9/10/2024	2	Analytic Methods/AI Tools – Part 1 ➢ Network Analysis ➢ Network Analysis Workshop	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
5th	16/10/2024	2	Analytic Methods/AI Tools – Part 2 ➢ Sentiment Analysis ➢ Sentiment Analysis Workshop ➢ Topic Modeling ➢ Word2Vec and word embedding	blended learning	In **Achievement Tests** **Oral presentation** **Project** **Individual Skills**
6th	23/10/2024	2	Linux OS Python - Data processing Hadoop file system MapReduce	blended learning	
7th	30/10/2024	2	➢ Midterm Exam	blended learning	**Standard Tests1**
8th	6/11/2024	2	➢ Case Study using Machine learning	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**

			algorithm		
9th	13/11/2024	2	➢ Case Study using Machine learning algorithm.	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
10th	20/11/2024	2	➢ Visualization Tools/Others.	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
11th	27/11/2024	2	➢ Example 1: Face recognition (anti-terrorist, e-pay).	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
12th	4/12/2024	2	➢ Example 2: Yield strength prediction (ML).	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
13th	11/12/2024	2	➢ Example 3: Hardness prediction (ML)	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
14th	18/12/2024	2	➢ Recent advance in the field.	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**
15th	25/12/2024	2	➢ Precreation for the final exam	blended learning	**Achievement Tests** **Oral presentation** **Project** **Individual Skills**

12. Infrastructure :	
I. Textbooks:.	• Tom White " Hadoop: The Definitive Guide" Third Edit on, O'reily Media, 2012. • Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015.
II. References:	
III. Recommended reading: (Periodicals, Reports, …)	

IV. E-References, Websites, ….	

13. Assessments:		Type of Assessment Description											
	Weighting	Theory						Practical					
Course Work	Total	T.1	T.2		Assig.		Atten	T.1	T.2	Proj			Atten
	50	10	10		5		5	5	5	5			5
Final	Total	Theory						Practical					
	50	30						20					
Total	100												

14. Course Development Plan

Expanding the course by adding some topics related to Big Data Analysis in healthcare systems in Iraq