



## Course Specifications (Postgraduate Degree)

<b>Course Title:</b>	<b>Big Data Analytics</b>
<b>Course Code:</b>	<b>504PMDS-3</b>
<b>Program:</b>	<b>Professional Master of Data Science</b>
<b>Department:</b>	<b>Computer Science</b>
<b>College:</b>	<b>Computer Science and Information Systems</b>
<b>Institution:</b>	<b>Najran University</b>

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## A. Course Identification

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

### 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	50
2	Laboratory/Studio	20
3	Tutorial	
4	Others (specify)	
	<b>Total</b>	<b>50</b>

## B. Course Objectives and Learning Outcomes

<p><b>1. Course Description</b></p> <p>This course introduces big data analytics tools and techniques required to leverage data effectively and make informed, real-time, and data driven decisions. The focuses include analytic techniques for decision making and the ability to examine big data across different business domains. Hands-on experiences will develop skills in data modeling for complex problems in medium to large organizations including the use of Apache Hadoop and Spark, NoSQL Databases.</p>
<p><b>2. Course Main Objective</b></p> <ul style="list-style-type: none"> <li>To introduce students to the concept of Big Data</li> <li>To introduce students to the fundamental platforms, such as Hadoop, Spark, and Linked Big Data</li> </ul>

- To introduce several data storage methods and how to upload, distribute, and process them.
- To gain knowledge on applying Big Data concepts on real-world challenges

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge</b>	
1.1	Demonstrate an in-depth understanding of the theoretical concepts, processes, and technologies underpin big data	K1
1.2	Describe the Big Data processes in forecasting & predictive analytics such regression, classification, clustering, optimization, and simulation	K1, K2
1...		
<b>2</b>	<b>Skills</b>	
2.1	Critique and assess the strengths and weaknesses of big data & tools and platforms and assess to what extent big data analytics help in enhancing decision making.	S1, S2
2.2	Ability to apply various data analysis, visualization, modeling techniques.	S3
2.5	Specify, design, implement and communicate effectively big data solutions utilizing appropriate tools and techniques to meet the needs of all stakeholders.	S1, S2
<b>3</b>	<b>Competences:</b>	
3.1	Demonstrate ability to communicate effectively in writing and presentation about Big Data landscape and how it's transforming businesses	C1
3.2		
3.3		
3...		

### C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Big Data Analytics	7
2	Big Data Platforms and Data Storage	7
3	Big Data Analytics Algorithms I	7
4	Big Data Analytics Algorithms II	7
5	Linked Big Data Analytics	3
5	Graph Database and Analytics	7
6	Streaming Big Data Analytics	7
7	Big Data Visualization I	3
8	Big Data Visualization II	3
9	Big Data for AI on Healthcare	3
10	Big Data for AI on Finance	3
<b>Total</b>		<b>50</b>

## D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Demonstrate an in-depth understanding of the theoretical concepts, processes, and technologies underpin big data	TS-1: Relate Course Learning Outcomes (CLOs) to the topics	Quiz Assignments Midterm Examination Final Examination
1.2	Understand Big Data processes in forecasting & predictive analytics such regression, classification, clustering, optimization, and simulation	TS-2: Giving Lectures in PPT, recalling the lecture through asking Questions. Clarifying doubts on Lecture.	
1.3		TS-3: Conducting a discussion of real life problems, among teacher, students.	
...		The course will be taught in a combined form of seminars and lab sessions. Readings will be assigned every week and students are expected to participate in discussion during the seminars. Students are also expected to participate in lab sessions and complete lab exercises on computers.	
<b>2.0</b>	<b>Skills</b>		
2.1	Critique and assess the strengths and weaknesses of big data & tools and platforms and assess to what extent big data analytics help in enhancing decision making.	TS-1: Relate Course Learning Outcomes (CLOs) to the topics	Quiz Assignments Midterm Examination Final Examination,
2.2	Ability to apply various data analysis, visualization, modeling techniques.	TS-2: Giving Lectures in PPT, recalling the lecture through asking Questions. Clarifying doubts on Lecture.	Quiz, Assignments Final Examination
2.3	Specify, design, implement and communicate effectively big data solutions utilizing appropriate tools and techniques to meet the needs of all stakeholders.	TS-3: Conducting a discussion of real life problems, among teacher, students	Quiz Assignments Final Examination
2.4		TS-4: Cooperative learning among the students. Encourage students to browse different journals, seminars or websites at their leisure time to	Lab Assignments, Midterm Examination,
2.5			Final Examination

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		<p>have a better understanding about the course.</p> <p>The course will be taught in a combined form of seminars and lab sessions. Readings will be assigned every week and students are expected to participate in discussion during the seminars. Students are also expected to participate in lab sessions and complete lab exercises on computers.</p>	
<b>3.0</b>	<b>Competences</b>		
3.1			
3.2			
...			

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz1	3 <sup>rd</sup> week	5%
2	Midterm	6 <sup>th</sup> week	20%
3	Project	5 <sup>th</sup> week	10%
4	Theory Assignments	2 <sup>th</sup> , 5 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup> weeks	10%
5	Lab Assignments	7 <sup>th</sup> week	10%
6	Quiz2	10 <sup>th</sup> week	5%
8	Final Exam	12 <sup>th</sup> or 13 <sup>th</sup> week	40%

\*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 :

- Weekly office hours + Appointments
- Weekly academic advising hours
- Extra weekly 2 office hours prior to exams.
- Tutorials are also provided to the students

## F. Learning Resources and Facilities

## 1. Learning Resources

<b>Required Textbooks</b>	Big Data Analytics, By Seema Acharya, Subhasini Chellappan, Wiley 2015
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>• Big Data and Business Analytics, By Jay Liebowitz, 2013</li> <li>• Mining of Massive Datasets, By Anand Rajaraman and Jeffrey David Ulman, 2012</li> <li>• Intelligent Data Analysis, By Michael Berthold, David J. Hand, Springer (2007)</li> </ul>
<b>Electronic Materials</b>	
<b>Other Learning Materials</b>	

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Room B-58 Laboratory A-16L
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Data show, PCs.
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> <li>• Printer is important in the lab to print reports and some snapshots.</li> <li>• Projector and PC for the lab instructor is required</li> </ul>

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Online course survey	Students	Indirect
Focus group discussion with small groups of students.	Instructor	Direct
Extent of achievement of course learning outcomes	instructor	Direct

**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

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