

## ITEC-416 Big Data Analytics

### General Information

<b>Course Code</b>	ITEC-416 Elective-3	<b>Level/ Year</b>	8 <sup>th</sup> / 4 <sup>th</sup>	<b>Required (R)/ Selected Elective (SE)</b>			<b>SE</b>
<b>Credit Hours</b>	Theory		2	Lab	1	Total	3
<b>Prerequisites</b>	ITEC-313 Introduction to Data Science ITEC-314 Machine Learning						
<b>Course Coordinator</b>	Dr. Rahama Salman						

### Course Description

This course will first introduce the overview applications, market trend, and the things to learn. Then, it will introduce the fundamental platforms, such as Hadoop, Spark, and other tools, such as IBM System G for Linked Big Data. Afterwards, the course will introduce several data storage methods and how to upload, distribute, and process them. It also covers different ways of handling analytics algorithms on different platforms.

### Course Objectives

- ◆ Be aware of the facts, capabilities, and benefits of big data.
- ◆ Apply analytics algorithms on different platforms to big data.
- ◆ Learn about uploading, distributing, and processing big data.
- ◆ Understand big data management and their technologies included visualization issues and mobile issues.
- ◆ Handle various real-world challenges on Big Data Analytics.

### Course Contents

List of Topics	Weeks
<b>UNIT 1:</b> Understanding Big data, Lab: RStudio environment setup	1,2
<b>UNIT 2:</b> Business Motivations & Drivers for Big Data Adoption	3, 4
<b>UNIT 3:</b> Enterprise Technologies and Big Data Business Intelligence: Technology Foundations for Big Data	5, 6, 7
<b>UNIT 4:</b> Big Data Storage Concepts	7, 8, 9
<b>UNIT 5:</b> Big Data Processing Concepts	10, 11, 12
<b>UNIT 6:</b> Big Data storage Technology -Real Time Analysis: In-Memory Processing	13, 14, 15

### Textbook

- Big Data Analytics: A Hands-On Approach 2019 by Arshdeep Bahga & Vijay Madisetti,
- Th. Erl, W. Khattak, and P. Buhler, "Big Data Fundamentals: Concepts, Drivers & Techniques" 2016
- Big Data for Dummies® Published by John Wiley & Sons

### Reference Materials

- Ivanka Menken, "Big Data Complete Certification Kit", Core Series for IT
- "Data Science and Big Data Analytics Student Guide" distributed by EMC Education Services will be provided to the students-2015
- Foster Provost and Tom Fawcett, "Data Science for Business: What You Need to Know about Data Mining and Data-analytic Thinking.
- Demirbaga, Ümit, Gagangeet Singh Aujla, Anish Jindal, and Oğuzhan Kalyon. Big data analytics: theory, techniques, platforms, and applications. Springer Nature, 2023.
- Big-data-analytics-for-beginners-Mastering the Art of data driven decision making, sam-campbell.

### Course Learning Outcomes

CLO	Description	Level of Learning (LOL)	Mapped PI
CLO 1.1	<b>Define</b> the basic concepts and terminologies of big data analytics process	Knowledge	PI 1.1
CLO 1.2	<b>Explain</b> the critical methods, techniques and algorithms commonly used in different platforms of big data	Comprehension	PI 1.2, PI 1.4
CLO 2.1	<b>Demonstrate</b> proficiency with the methods and techniques for uploading, distributing, storing and processing large amount of big data	Comprehension Analysis	PI 1.3, PI 2.2
CLO 2.2	<b>Construct</b> and <b>build</b> big data applications through highly scalable systems including visualization and statistical modelling tools	Creating	PI 2.1, PI 2.2
CLO 2.3	<b>Apply</b> concepts and principles to handle, analyze and interpret various real-world challenges on Big Data Analytics using analytics and statistical modelling	Application	PI 2.3, PI 2.4
CLO 3.1	<b>Evaluate</b> and determine appropriate solutions for a problem and communicate through reports/presentations and demonstrate the ability to function in a group and Elaborate as a team member to attain a common assignment.	Evaluating Application Demonstrating	PI 3.1, PI 3.2, PI 5.1

### CLO-SO-PI Mapping

	SOs					
CLOs	SO1	SO2	SO3	SO4	SO5	SO6
CLO#01	PI 1.1	-	-	-	-	-
CLO#02	PI 1.2, PI 1.4	-	-	-	-	-
CLO#03	PI 1.3	PI 2.2	-	-	-	-
CLO#04	-	PI 2.1, PI 2.2	-	-	-	-
CLO#05	-	PI 2.3, PI 2.4	-	-	-	-
CLO#06	-	-	PI 3.1, PI 3.2	-	PI 5.1	-

### Approvals

<b>Prepared by</b> <b>Course Coordinator</b>	Dr. Rahama Salman		
<b>Approved by</b> <b>Track Leader</b>	Dr. John Martin	<b>TL</b> <b>Signature</b>	
<b>Last updated</b>	August 18, 2024		