Course Specifications

Course Title:	Big Data
Course Code:	**502577-3**
Program:	**Bachelor in Information Technology**
Department:	**Department of Information Technology**
College:	**College of Computers and Information Technology**
Institution:	**Taif University**

Table of Contents

A. Course Identification

1. **Credit hours: 3**

2. **Course type**

a.   University ☐   College ☐   Department ☐ √   Others ☐

b.   Required ☐   Elective ☐ √

3. **Level/year at which this course is offered: 14 or 15/5**

4. **Pre-requisites for this course** (if any)**:** Computer System security **502571-3 Data mining OR 502570-3 Advanced Topics in Database**

5. **Co-requisites for this course** (if any)**:** **NAN**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	8	100%
2	**Blended**	0	0
3	**E-learning**	0	0
4	**Distance learning**	0	0
5	**Other**	0	0

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	50
2	**Laboratory/Studio**	30
3	**Tutorial**	
4	**Others** (specify)	
	Total	80

B. Course Objectives and Learning Outcomes

1. Course Description

Big data is the description used to encompass the huge amounts of data that is common to many businesses. The course aims to build on the principles upon which serious Big data resources are built. All of the data held in Big Data resources must have a form that supports search, retrieval, and analysis. This course provides practical foundation level training that enables immediate and effective participation in big data and other analytics projects. It includes an introduction to big data and the data analytics lifecycle to address business challenges that leverage big data. The course provides grounding in basic and advanced analytic methods and an introduction to big data analytics technology and tools, including MapReduce and Hadoop which will be used to develop a range of big data applications. By the end of this course, student will learn analytical skills to study big data and to provide a solid foundation for developing solutions and applications that need to manipulate big data.

2. Course Main Objective

The main objective of this course is to establish a strong working knowledge of concepts, techniques, and products associated with Big data. By the end of this course, student will learn analytical skills to study big data and to provide a solid foundation for developing solutions and applications that need to manipulate big data.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Describe the concept of big data and its dimensions	K1
2	**Skills :**	
2.1	Compare between tools and technique to analyze big data	S1
2.2	Justify statistical analysis of big data	S1, S2
2.3	Design big data solutions	S2
3	**Values:**	
3.1	Criticize big data analytics methodology	V1
3.2	Demonstrate working in a group to build a database to support big data issues for an organization	V2

C. Course Content

No	List of Topics	Contact Hours
1	Overview of Big data : Definition and its Characteristics	5
2	Big Data in Industry and Data Analytics Skills	5
3	Big Data Analytics Lifecycle	10
4	Big Data analytics – Theory and Methods	10
5	Big Data Technologies and Tools – MapReduce and Hadoop	10
6	The Hadoop ecosystem	10
7	In-database Analytics SQL Essentials	10
8	Advanced SQL and MADlib	10
9	Operationalizing an Analytics Project and Data Visualization Techniques	
	Total	80

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 concept of big data and its dimensions.	Lecture Discussion	Written Exams Assignments Group Projects
2.0	**Skills**		
2.1	Compare between tools and technique to analyze big data	Lecture Discussion Lab work	Written Exams Assignments Practical Exam
2.2	Justify statistical analysis of big data	Lecture Discussion	Written Exams Assignments

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		Lab work	Practical Exam
2.3	Design big data solutions	Lecture Discussion Lab work	Assignments Practical Exam Group Projects
3.0	**Values**		
3.1	Criticize big data analytics methodology	Lecture Discussion Work group	Writing Exam Assignments Reports Oral Presentations
3.2	Demonstrate working in a group to build a database to support big data issues for an organization	Discussion Lab work Work group	Group Projects

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments	3 - 10	5%
2	Mid Exam	6	20%
3	Minor project	10	10%
4	Final presentation	11	5%
5	Lab Exam	11	20%
6	Final Exam	12	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:
Academic advising and counseling of students is an important component of teaching; student academic advising is a mandatory requirement of College of Computers and Information Technology (CCIT). Appropriate student advising provides support needed for the student during times of difficulty. In addition, it helps the student to build a close relationship with his/her advisor and to provide student motivation and involvement with the institution.

In addition, since faculty are usually the first to recognize that a student is having difficulty, faculty members play a key role in developing solutions for the students or referring them to appropriate services. Faculty members also participate in the formal student-mentoring program.

Additional counseling is provided by course directors, who provide students with academic reinforcement and assistance and refer "at risk" students to the Vice Dean for Academic Affairs and the Vice Dean for female section.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, EMC Education Services, ISBN: 9781118876138, 2015, Wiley
Essential References Materials	Big Data Fundamentals: Concepts, Drivers & Techniques, Erl, T., Khattak, W., Buhler, P., ISBN: 9780134291079, 2016, Prentice Hall Principles of Big Data : preparing , sharing and analyzing complex information, Jules J.Berman, Elsevier, 2013 Hadoop For Dummies, Dirk deRoos, For Dummies, 2014
Electronic Materials	Presentations and recorded lectures
Other Learning Materials	-

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• A Lecture room appropriate for maximum 25 students with a personal computer, a data show and a smart board. • A Lab room appropriate for maximum 15 students with a personal computer, a data show and a smart board.
Technology Resources (AV, data show, Smart Board, software, etc.)	Lab materials and required software
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	Students	Students' surveys and Students course evaluation
Improvement of Teaching	Course Coordinator	deficiencies based on the student Evaluation, faculty input, course file, and program assessment
Verifying Standards of Student Achievement	Curriculum Committee	• Review CAF (Course assessment file) • Alumni surveys.

Evaluation Areas/Issues	Evaluators	Evaluation Methods
		● Periodic exchange and remarking of tests or a sample of assignments with staff at another

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	IT Department Council/ Executive program committee
Reference No.	11
Date	23/10/21443