University: ***Fayoum University***
Faculty: ***Computers and Information***
Department: ***Computer Science***

Course Specification

1- Basic Information		
Code:	**Course Title:** Big Data Management	
Programme	**Number of units:**	**Lecture:** 2 hr/ week **Tutorial:** 0 hrs/ week **Practical:** 2 hrs/ week

2- Aims of Course:	1. Provide students with a solid understanding of the principles, methods and technologies for big data management to drive business innovations; 2. Equip students with the essential knowledge and skills to design a plan for big data management and evaluate the effectiveness of the proposed solution; 3. Enable students to apply the learnt methods and technologies in big data management for business improvements and innovations.

3- Intended Learning Outcomes	
A- Knowledge and Understanding:	A7 Demonstrate essential facts, concepts, principles and theories relating to computing **and information** and computer applications as appropriate to the program of study A10 Identify and explain the fundamental concepts, principles, and techniques needed for the analysis, development, validation, verification, deployment, and operations of computer-based systems. A12Selects advanced topics to provide a deeper understanding of some aspects of the subject A13Define the mapping of real-world problems to algorithmic solutions **Through the Following** a1) Identify and distinguish big data analytics applications a2) Describe big data analytics tools 3 Explain big data analytics a3) techniques 4 Present cases involving big data analytics in a4) solving practical problems

B- Intellectual Skills:	B1 Analyze real problems, and appropriate problem solving methods that satisfy commercial or industrial constraints and analyze results B2 Determine different computer- system application attributes, components, relationships, patterns, architecture, and source of errors. **Through the Following** a1) Understand the principles, methods and technologies of big data management for business improvements and innovations. a2) analyse big datasets through the use of application software
C- Professional and Practical Skills:	C7) Plan, schedule, control, and lead ICT projects. **Through the Following** c1) Conduct big data analytics using system tools c2) Suggest appropriate solutions to big data analytics problems
D- General and transferable Skills	D4) Demonstrate independent critical thinking and problem solving skills. D6) Demonstrate skills in team work, team management, time management and organizational skills. **Through the Following** d1) Demonstrate that they have mastered the required background knowledge to pursue graduate studies in the fields of cloud systems and big data.

3-Course Content:	1. Introduction Concepts and principles of big data (e.g. volume, velocity, variety and veracity), market and business drivers, industry barriers and considerations for big data management in a business context. 2. The business cases Characteristics of big data applications, perception and quantification of business values, assessing organizational fitness, and design of business cases for big data applications. 3. Types of big data applications, product knowledge hub, infrastructure and operations studies, location-based services, profile-based recommendation services. 4. technologies are right for you, good practices for soliciting business user requirements. 5. High-performance appliance for big data management Storage considerations, big data appliances (hardware and software tuned for big data applications), architectural choices, performance characteristics, platform alternatives. 6. Big data tools and techniques Overview of high-performance architectures Hadoop, 7. Distributed File Systems GFS,OCSS,DOCSS,HDFS, 8. MapReduce and YARN, Spark, HBase, 9. Hive and Mahout.

	10. Big data applications Managing the lifecycle of big data, machine-to-machine data, big transaction data, biometrics,

4- Teaching and Learning Methods:	1. Lectures 2. Literature Reviews 3. Computer-lab Sessions 4. Practical lab work 5. Class discussions 6. Internet searches 7. Problem-based searching

5- Student Assessment	
A- Assessment Methods:	1. Assignments and Quizzes 2. Midterm written exam 3. Oral Exam 4. Practical exam 5. Final written exam
B- Assessment schedule:	Midterm Examination: Week 7 Practical examination: Week 12 Oral Examination: Week 13 Final Examination: Week 14
C- Weighting of assessments:	Assignments and Quizzes: 0% Mid-Term Examination: 20% Oral Examination: 10% Practical Examination: 10% Final-term Examination: 60%

6- Books and References	
A- Notes:	Handouts and notes prepared by the instructor
B- Essential Books (Text Books):	David Loshin, 2013, Big Data Analytics: From strategic planning to enterprise integration with tools, techniques, NoSQL and graph, Elsvier, ISBM: 978-0-12-417319-4.
D- Periodicals, Web sites, … etc	Arvind Sathi, 2012, Big Data Analytics: Disruptive Technologies for Changing the Game, MC Press Online, ISBN: 978-1-58347-380-1.

Course Professor: Dr. Mohamed Khafagy Department Head: Dr. Amira Edress

Course Content	Week	Knowledge & Understanding					Intellectual Skills		Professional & Practical Skills		General & Transferable Skills		
		a1	a2	a3	a4		b1	b2	c1	c2	d1		
Introduction Concepts and principles of big data (e.g. volume, velocity, variety and veracity), market and business drivers, industry barriers and considerations for big data management in a business context.	1			x			x	x	x		x		
The business cases Characteristics of big data applications, perception and quantification of business values, assessing organizational fitness, and design of business cases for big data applications.	2	x		x			x	x	x		x		
Types of big data applications, product knowledge hub, infrastructure and operations studies, location-based services, profile-based recommendation services.	3			x			x	x	x		x		
technologies are right for you, good practices for soliciting business user requirements.	4	x	x	x	x		x	x	x		x		
High-performance appliance for big data management Storage considerations, big data appliances (hardware and software tuned for big data applications), architectural choices, performance characteristics, platform alternatives.	5	x		x	x		x	x	x		x		
Big data tools and techniques Overview of high-performance architectures Hadoop,	6	x	x	x			x	x	x		x		
Distributed File Systems GFS,OCSS,DOCSS,HDFS,	7	x		x			x	x	x		x		
Midterm	8	x	x	x	x		x	x	x		x		
MapReduce and YARN, Spark, HBase,	9	x	x	x			x	x	x		x		
Hive and Mahout.	10	x	x	x			x	x	x		x		
Big data applications Managing the lifecycle of big data, machine-to-machine data, big transaction data, biometrics	11	x		x			x	x	x		x		

Course coordinator: Dr. Mohamed Khafagy Department Head: Dr. Amira Edress