COLLEGE OF INFORMATION TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE SYLLABUS/ SPECIFICATION

Course Code & Title: **ITCS 515 – Business Intelligence**

Weight: **(3 - 0 - 3)**

Prerequisite: NONE

NQF Level Allocated: Level 9

NQF Notional Hours / Credits: 120 notional hours/ 12 NQF credit

Description: Business intelligence (BI) refers to the science of using advanced analysis and reporting tools to discover the necessary information used by an organization to make sound decisions. In this course, students will learn how to maximize business advantage by locating, extracting and dispersing information. Moreover, students will be introduced to some BI software and tools such as Microsoft BI. The covered topics include business intelligence framework, infrastructure, and current techniques used to extract, transform, and analyze business data, and to discover knowledge to support business decision-making

Objective:

1. To understand a range of specialized theories, principles and concepts of BI.
2. To explain how to maximize business advantage by locating, extracting and dispersing information.
3. To explain the importance of BI in large and medium-sized corporations.
4. To critically explore various and advanced techniques, tools and good practices in BI.
5. To research current trends of BI practices and applications in industry.

SEMESTER: **ACADEMIC YEAR:**

INSTRUCTOR:
OFFICE TEL:
EMAIL:

Intended Learning Outcomes (ILOs):

A. Knowledge and Understanding		NQF Descriptor/ Level
A1	**Concepts and Theories:** *Demonstrate critical knowledge and understanding of key concepts and theories of BI, data warehousing and data mining.*	Knowledge: theoretical understanding [Level 9]
A2	***Contemporary Trends, Problems and Research:*** *Demonstrate an informed and critical awareness of the current research, trends and advancements in decision-support systems and BI applications, integration, technologies and tools.*	Knowledge: theoretical understanding [Level 9]
A3	***Professional Responsibility:*** Demonstrate cognizance of and adhere to the IT-related roles and responsibilities of professionals working in BI environments.	Knowledge: theoretical understanding [Level 9]

B. Subject-specific Skills		NQF Descriptor/ Level
B1	**Problem Solving:** Critically analyze and identify business problems, and develop BI solutions for them to inform decision making.	Communication, ICT and Numeracy Skills [Level 9] Knowledge: practical application [Level 9]
B2	**Modeling and Design:** Develop a multidimensional data models and design BI systems to facilitate decision making.	Knowledge: practical application [Level 9]
B3	***Application of Methods and Tools:*** Apply data mining techniques, OLAP, and BI software to generate business intelligence.	Communication, ICT and Numeracy Skills [Level 9] Knowledge: practical application [Level 9]

C. Critical-Thinking Skills		NQF Descriptor/ Level
C1	**Analytic skills:** Evaluate the complexity of challenging business processes and critically analyze its decision support systems, structured and unstructured data, resources, roles, risks, and performances to generate useful information and knowledge that lead to effective and efficient enhancement of the business processes.	Generic problem solving and analytical skills [Level 9]
C2	**Synthetic:** Integrate individual software components with other components such as a Neural Network classifier in order to create a larger AI system with more capabilities.	Generic problem solving and analytical skills [Level 9]
C3	**Creative:** Identify new business problems, processes or decision-support systems that can be solved or improved efficiently using advanced BI methods, techniques and tools in a way that supports insight and improve decision making.	Generic problem solving and analytical skills [Level 9] Competence: Autonomy, Responsibility and Context [Level 9]

D. General and Transferable Skills (other skills relevant to employability and personal development)		NQF Descriptor/ Level
D1	**Communication:** Develop an ability to effectively communicate with peers, and senior colleagues. Honing presentations skills in project report writing and oral presentation.	Communication, ICT and Numeracy Skills [Level 9]
D2	***Teamwork and Leadership:*** Work as a member/leader of a team project for developing a BI solution for business problem.	Competence: Autonomy, Responsibility and Context [Level 9]
D3	***Organizational and Developmental Skills:*** Engage in life-long learning and continuing self-development to enhance and practice professional and organizational skills in order to effectively prioritize,	Competence: Autonomy, Responsibility

	plan, manage and allocate appropriate time to implement tasks in BI projects and assignments.	and Context [Level 9]
D4	***Ethics and Social Responsibility:*** Understand and adhere to the ethical values and responsibilities involved in, e.g., the analysis of business data and information.	Competence: Autonomy, Responsibility and Context [Level 8]

Course Structure (Outline)

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Week	**Hours**		**ILOs**	**Topics**	**Teaching Method**	**Assessment Method**
	Lec.	**Lab**				
1	3	-	A1	**Introduction to BI**	Lecture/ Class discussion	Major Exam (9th week) and Final Exam (Last Week)
2	3	-	A1	**Business Intelligence**: Concepts, components, framework and importance of BI	Lecture/ Class discussion	Major Exam (9th week) and Final Exam (Last Week)
3, 4	3	-	A1,A2, D1, D3, D4	**Business Intelligence:** how BI supports decision process, and Decision Support Systems	Lecture/ case studies/ Independent learning	Major Exam (9th week) and Final Exam (Last Week)/ **Research Assignment1**
5	3	-	A1,A2, C2, D1, D3, D4	**Data Warehouses, and Data Marts**	Lecture/ Class discussion/ Independent learning	Project (week 15)/ Major Exam (9th week) and Final Exam (Last Week)/ **Research Assignment 2**
6	3	-	C2	**ETL:** Data Extracting, Transformation, and Loading;	Lecture/ Class discussion	Project (week 15)/ Major Exam (9th week) and Final Exam (Last Week)

7	3	-	A1,B2, C1	**OLAP:** Online Analytical Processing, applications, multidimensional data, functionality and architecture	Lecture/ Exercises/ Class discussion	**Exercises**/Major Exam (9th week) and Final Exam (Last Week)/ Project (week 15)
8	3	-	B3	**BI Tools**	**Software Demonstration**	Project(week 15)
9-11	9	-	A1, B1,B2,C1,C2	**Data Mining**: Data mining concepts, process, data mining techniques	Lecture/ Class discussion/ Exercises	**Exercises**/ Project (week 15)/ **Major Exam** (9th week) and Final Exam (Last Week)
12	3	-	A2, B1,B2,C1,C2, D1, D3, D4	**Data Mining**: Intelligent Techniques, such as genetic algorithm and neural networks	Lecture / Exercises/ Independent learning	**Exercises/**Project (week 15)/ **Research Assignment3**/ Final Exam (Last Week)
13	3	-	B3	**Data Mining Tools**	**Software Demonstration**	Project (week 15)
14	3	-	A3, B1,B2, C1,C2	**BI Project Planning**	Lecture/ Class discussion	Project (week 15)/Final Exam (Last Week)
15	3	-	A2, A3, B1,B2,B3, C1,C2,C3,D1,D2,D3, D4	BI team research project presentations	Student research project presentations/ discussion	**Evaluation of Research Project Reports and Presentations**
16	2					**Final Exam (**A1, A2,A3,B1, B2, C1, C2)

Teaching Materials:

Textbook(s):	C. Vercellis, *Business Intelligence: Data Mining and Optimization for Decision Making,* Wiley, 2009.

	C. Howson, *Successful Business Intelligence: Unlock the Value of BI & Big Data*, 2nd Ed., McGraw-Hill Osborne Media, 2013.
Handout(s):	PowerPoint slides available on Moodle i.e. http://www.ahlia.edu.bh/moodle
Reference(s):	1. Rick Sherman, *Business Intelligence Guidebook: From Data Integration to Analytics,* 1st Edition, 2014. 2. Jiawei Han, Micheline Kamber, Jian Pei Simon, *Data Mining - Concepts and Techniques,* 3rd Edition, Elsevier, 3rd Edition, 2011. 3. Rajiv Sabherwal and I. Becerra-Fernandez, *Business Intelligence,* Wiley, 2011. 4. Turban, R. Sharda, D. Delen, D. King, *Business Intelligence: A Managerial Approach,* Pearson, 2013. 5. R. Kimball and M. Ross, *The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling*, 3rd Ed., Wiley, 2013. 6. Ramesh Sharda, Dursun Delen, Efraim Turban, *Analytics, Data Science, & Artificial Intelligence: Systems for Decision Support*, 11th Edition, 2019. 7. L. Torgo, *Data Mining with R: Learning with Case Studies*, Chapman and Hall/CRC, 2010. 8. M. Hofmann and R. Klinkenberg, *RapidMiner: Data Mining Use Cases and Business Analytics Application,* Chapman and Hall/CRC, *2013.* 9. More references are available in the course website in Moodle.

ASSESSMENT:

Type of Assessment	Description	ILOs	Weighting
Three Research Assignments	The assignments consist of essay, problem-solving and research based theoretical questions regarding topics in business intelligence (BI). The purpose of the assignments is to assess students where they have to demonstrate their extensive and detailed knowledge and critical understanding of key concepts, theories, methods, tools and techniques of BI. The assignment will also assess students' skills to identify and formalize business processes and develop BI solutions for them to inform decision making. Soft copy submission is required through the course page in Moodle where answers will be checked by Turnitin against plagiarism.	A1, A2, B1, B2, C1, C2, D3, D4	20%
Exercises	In-class exercises consist of problem solving and application of different methods, algorithms, and data models. Each exercise will be one hour duration.	B1, B2, C1	Formative

Major Exam	The major exam will be an in-class 90 minutes exam that will consists of short-answer, essay, and problem solving questions and cover the topics studied in the first 7 weeks.	A1, A2, B1, B2, C1,C2	20%
Team Research Project Report and Presentation	Starting from weak 4, the class will be divided into teams of 4-5 students and each will be asked to study a research problem in BI utilizing the skills and tools learned in class. Teams are required to plan and execute the research project that may involve the application of advanced techniques, skills and tools in BI and decision-support systems to develop solutions for business-related problems. In the final week, each team will have to submit their research report explaining the research problem, research methods used, analysis and the conclusion highlighting the research findings and results. The report must explain precisely the work accomplished by each student. Each team will be required to make a presentation summarizing the research conducted and its findings. Each team member has to participate in the presentation. Team-based work will be examined and evaluated as a whole as well as the individual work of each student. Team members will be tested individually during the presentation by peers and the instructor.	A2, A3, B1,B2,B3, C1, C2,C3, D1,D2, D3,D4	20%
Final Exam	The final exam is comprehensive and will be of two hours duration. It will consist of short-answer, essay and problem-solving questions in data analytics.	A1, A2, A3,B1,B2, C1, C2	40%
		Overall	100%

Admissions	
Pre-requisites	**NONE**
Minimum number of students	**4**
Maximum number of students	**25**

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