

Title (Units): **COMP4096 Business Intelligence and Decision Support (3,2,1)**

Course Aims: To provide a study of business intelligence and underlying techniques, including data warehousing, online analytic processing (OLAP), online transaction processing (OLTP), and information mining. Emphasis will be placed on the understanding of enabling technologies and their applications to improve operations and decision making in business contexts, such as how to improve transport systems, how to achieve optimized and sustainable supply chain, how to make vaccine policy and strategy.

Prerequisite: COMP2016 Database Management

Anti-requisite: COMP4145 Business Intelligence and Decision Support (Project)
ISEM3016 Decision Support and Intelligent Systems in Business

Course Intended Learning Outcomes (CILOs):

Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Describe business intelligence methodologies and concepts
2	Explain the characteristics, architectures, and development of data warehouses, data marts, and decision support systems
3	Distinguish between Online Analytic Processing (OLAP) and Online Transaction Processing (OLTP), and identify the different types of OLAP
	Professional Skill
4	Perform data warehouse and data mart design
5	Formulate analysis database queries in SQL for analyzing business data
6	Apply appropriate business intelligence and information mining techniques to extract significant patterns and solve problems in business and healthcare contexts

Calendar Description: Students will learn the methodologies and concepts of business intelligence, including the characteristics, architectures, and development of data warehouses and data marts. After completing the course, the students will understand the features and applications of Online Analytic Processing (OLAP), and identify the different types of OLAP. Emphasis will be placed on the understanding of enabling technologies and their applications to improve operations and decision making in business contexts, such as how to improve transport systems, how to achieve optimized and sustainable supply chain, how to make vaccine policy and strategy.

Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1, 2, 3	Lectures, mini-project or problem-solving assignment, class presentation, problem and laboratory classes
4, 6	Lectures, exercises and problem-solving assignments, or mini-project
5	Problem-solving assignments and laboratory classes
6	Lectures, exercises and assignments, independent information search and research as required by the mini-project, problem or laboratory tasks

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Laboratory Exercises	10%	4-6	Four laboratory exercises will be used to assess students' problem solving and business intelligence knowledge, related primarily to learning outcome 4-6.

2	Assignments	15%	4-6	Two assignments are designed to assess the students' mastery of the techniques and applications of business intelligence related mainly to learning outcomes 4 to 6.
3	Projects	25%	3-6	The group project are designed to achieve learning outcomes 3, 4, 5, and 6 by requiring students to work in a team environment to design and implement creative solutions through the application of the methodologies learned, as well as to apply the computer applications learned.
4	Examination	50%	1-6	The final examination is designed to measure the extent to which the students have reached all of the six learning outcomes. Students are required to have a good mastery of the concepts, techniques, methodologies, and applications of business intelligence to familiar as well as novel business situations and problems.

Assessment Rubrics:

Excellent (A)	<ul style="list-style-type: none"> • Achieves all six CILOs, demonstrating a good mastery of both the theoretical and practical aspects of the knowledge and skills associated with business intelligence and decision support • Able to develop and present sound arguments and correct solutions to problems, accompanied by in-depth analysis and insight • Demonstrates a thorough understanding and solid knowledge of business intelligence and decision support concepts, algorithms, and methodologies • Able to draw on a variety of techniques and relevant knowledge and appropriately apply them to new business intelligence and decision support situations and problems
Good (B)	<ul style="list-style-type: none"> • Achieves all six CILOs, demonstrating a good understanding of the associated concepts and underlying methodologies • Able to develop solutions to problems, accompanied by adequate explanations • Demonstrates a competent level of knowledge of business intelligence and decision support concepts, algorithms, and methodologies • Ability to make use of appropriate techniques and knowledge and apply them to familiar situations and problems
Satisfactory (C)	<ul style="list-style-type: none"> • Achieves most of the six CILOs, demonstrating a basic level of understanding of the associated concepts and underlying methodologies • Able to provide acceptable solutions to problems • Demonstrates an adequate level of knowledge of business intelligence and decision support systems and situations • Ability to make use of some techniques and knowledge and apply them to familiar situations
Marginal Pass (D)	<ul style="list-style-type: none"> • Achieves most of the six CILOs, with minimal understanding of the associated concepts and underlying methodologies • Able to provide solutions to simple problems • Demonstrates a basic level of knowledge of business intelligence and decision support systems and situations • Ability to apply some techniques and knowledge to a limited number of typical situations
Fail (F)	<ul style="list-style-type: none"> • Achieves less than three of the six CILOs, with little understanding of the associated concepts and underlying methodologies • Unable to provide solutions to simple problems • Knowledge of business intelligence and decision support falling below the basic minimum level • Unable to apply techniques and knowledge to situations or problems

Course Content and CILOs Mapping:

Content		CILO No.
I	The Business Intelligence Framework	1, 6
II	The Data Warehouse	2, 4
III	Online Analytic Processing (OLAP) and Business Analytics	3, 5
IV	Case Studies and Applications	1, 6

References:

- Turban, E., Aronson, J., Liang, T., and Sharda, R. Decision Support and Business Intelligence Systems. 10th Edition, Prentice Hall, 2014.
- Inmon, W. H. Building the Data Warehouse. 4th Edition, Wiley, 2005.
- E. S. Berner (Ed.) *Clinical Decision Support Systems: Theory and Practice*, 2nd Edition, Springer, 2010.

Course Content:

Topic

- I. The Business Intelligence Framework
 - A. The decision making process
 - B. Types of decision problems and support systems
 - C. Major characteristics of business intelligence
 - D. Structure and components of decision support systems

- II. The Data Warehouse
 - A. Characteristics of a data warehouse
 - B. Data warehouse architectures
 - C. Star and snowflake schemas
 - D. Data integration and the extraction, transformation, and load (ETL) process
 - E. Data warehouse development

- III. Online Analytic Processing (OLAP) and Business Analytics
 - A. OLAP (Online Analytic Processing) vs OLTP (Online Transaction Processing)
 - B. Multidimensional analysis
 - C. Knowledge discovery and information mining

- IV. Case Studies and Applications
 - A. Customer relationship management (CRM)
 - B. Supply chain management (SCM)
 - C. Business Performance Management (BPM)
 - D. Clinical Decision Support Systems