Title (Units): **COMP4145 Business Intelligence, Decision Support and Project Development (4,2,2)**

Course Aims: To provide students with necessary skills, technologies and methods to conduct business computing project. Students will apply both business and computer science skills, as well as business intelligence and its underlying techniques, including data warehousing, online analytic processing (OLAP), online transaction processing (OLTP), information retrieval and processing, data analysis and data reporting, to accomplish business computing project. It aims to equip students with hands-on experience in compiling business intelligence with computer applications to improve decision making in business. Emphasis will be placed on conducting business computing project, such as how to improve transport systems, how to achieve optimized and sustainable supply chain.

Prerequisite: COMP2016 Database Management OR
COMP2865 Fundamental of Data Analysis and Management

Anti-requisite: COMP4096 Business Intelligence and Decision Support
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 and compare business analytics and data mining techniques
3	Elaborate the steps in conducting business computing project systematically
	Professional Skill
4	Develop business intelligence solutions (e.g., perform data warehouse and data mart design, and formulate analysis database queries for analyzing business data)
5	Apply appropriate business intelligence and data mining techniques to extract significant patterns and solve problems in business
6	Conduct business computing project with computer application(s)

Calendar Description: Students will apply both business and computer science skills, as well as business intelligence and its underlying techniques, including data warehousing, online analytic processing (OLAP), online transaction processing (OLTP), information retrieval and processing, data analysis and data reporting, to accomplish a business computing project. It aims to equip students with hands-on experience in compiling business intelligence with computer applications to improve decision making in business. Emphasis will be placed on conducting business computing project, such as how to improve transport systems, how to achieve optimized and sustainable supply chain.

Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1 - 3	Lectures, mini-project or problem-solving assignments, 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%	1-3	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	Assignments are designed to assess the students' mastery of the techniques and applications of business intelligence, as well as project skills in conducting business computing project are 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%	1-5	The final examination is designed to measure the extent to which the students have reached learning outcomes 1 to 5. Students are required to have a good mastery of the concepts, techniques, methodologies, and applications of business intelligence and data analysis to familiar as well as novel situations and problems in business, healthcare, and social well-being contexts.

Assessment Rubrics:

Excellent (A)

- 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, 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
- Able to conduct a variety of business computing projects, and make excellent and innovative use of the business intelligence to benefit the decision making in business at almost all the time

Good (B)

- 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, and methodologies
- Ability to make use of appropriate techniques and knowledge and apply them to familiar situations and problems
- Able to conduct common kinds of business computing projects, and make good use of the business intelligence to benefit the decision making in business consistently

Satisfactory (C)

- 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, as well project skills for business computing project
- Ability to make use of some techniques and knowledge and apply them to familiar situations
- Able to work on few types of business computing and make use of the business intelligence to benefit the decision making in business occasionally

Marginal Pass (D)	• 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, as well as project skills for business computer project • Ability to apply some techniques and knowledge to a limited number of typical situations • Can only work on business computing projects and make use of the business intelligence to benefit the decision making in business seldomly
Fail (F)	• 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, as well as project skills for business computing project falling below the basic minimum level • Unable to apply techniques and knowledge to situations or problems • Unable to work on business computing projects with computer application

Course Content and CILOs Mapping:

Content		**CILO No.**
I	The Business Intelligence Framework	1,4
II	Business Analytics and Data Mining Techniques	2,5
III	Project Development in Business Computing	3,6

References:

• Turban, E., Aronson, J., Liang, T., and Sharda, R. Decision Support and Business Intelligence Systems. 10th Edition, Prentice Hall, 2014.
• Sherman, R. Business Intelligence Guidebook: From Data Integration to Analytics, 1st Edition, Morgan Kaufmann, 2014.
• Sharda, R., Delen, D., Turban, E. Business Intelligence, Analytics, and Data Science, 4th Edition, Pearson, 2017.
• Inmon, W. H. Building the Data Warehouse. 4th Edition, Wiley, 2005.
• Russo, M. The Definitive Guide to DAX: Business Intelligence for Microsoft Power BI, SQL Server Analysis Services, and Excel, 2nd Edition, Microsoft Press, 2019.
• Silva, R.F. Power BI – Business Intelligence Clinic: Create and Learn, Independently Published, 2018.
• Meier, M., Baldwin, D., and Strachnyi, K. Mastering Tableau 2021: Implement Advanced Business Intelligence Techniques and Analytics with Tableau, 3rd Edition, 2021.
• Pichler, R. Agile Product Management with Scrum: Creating Products that Customers Love (Addison-Wesley Signature Series (Cohn)), 1st Edition, Addison-Wesley Professional, 2010.

Course Content:

<u>Topic</u>

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
   E. Characteristics of data warehouse
   F. Data warehouse architecture
   G. Data integration and the extraction, transformation, and load (ETL) process
   H. Data warehouse development

II. Business Analytics and Data Mining Techniques

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

III. Project Development in Business Computing
A. Defining the project scope and objective(s)
B. Methodologies of business computing projects
C. Technologies or applications for business computing
- Business intelligence compilation, such as multidimensional analysis, knowledge discovery and information mining (e.g. using Microsoft SQL Server Analysis Services)
- Tools for business data analytics (collect data, clean data, process data, analyze data, and visualize analysis results) (e.g., using tableau, PowerBI)