Title (Units):	**ITEC1006 Searching and Managing Information (3,2,1)**

Course Aims:	To introduce the techniques of efficiently organizing different types of information, and the mechanisms for searching and managing them, including the powerful features of current search systems. Emphasis is placed on large information sources and databases which will include both Internet and enterprise data.

Prerequisite:	General Education Core Course from the Information Management Technology Category

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 the characteristics of different forms of textual and multimedia information
2	Distinguish between the requirements of different types of search tasks
3	Explain the techniques used for efficient information organization with real-world examples
4	Describe the principles for producing and ranking Web search results
	Skill
5	Make use of the advanced features of popular search systems to locate different types of information
6	Use simple database management for searching and managing enterprise information
	Attitude
7	Be alert to the capabilities and limitations of information management systems and their impact on our society

Calendar Description:	This course provides a comprehensive examination of different popular search systems such as Google and YouTube. Students will be introduced to the powerful features in these systems, as well as the technology underpinning them. Students will learn how large information repositories are efficiently organized, managed and searched. They will also learn the principles of search engines, information retrieval, and how to use simple database management systems such as Access.

Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1-7	Lectures to introduce concepts, principles and techniques
2,5-6	Laboratories to practice search tasks with various search systems
4, 6	Tutorials to practice any mathematics or techniques introduced
2-3, 5, 7	Demonstration of example search systems
1, 3, 7	Case studies and movie clips on certain topics

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Continuous assessment	50%	3-7	This includes assessed tasks and assignments, which are designed to assess the students' ability to apply the techniques learned to carry out search tasks and manage information.
2	Examination	50%	1-7	The final examination is designed to measure the extent to which the students have reached all of the learning outcomes. Students are required to have a good mastery of the concepts, techniques, methodologies, and applications

				of information search and organization to different situations.

Assessment Rubrics:

	Excellent (A)	Good (B)	Satisfactory (C)	Marginal Pass (D)	Fail (F)
Information characteristics	• Demonstrate thorough understanding on characteristics of a wide range of information	• Demonstrate thorough understanding on characteristics of some kinds of information	• Demonstrate good understanding on characteristics of some kinds of information	• Demonstrate partially understanding on characteristics of some kinds of information	• Unable to demonstrate an understanding on characteristics of information
Knowledge and concepts of information search and management	• Demonstrate thorough understanding on the main concepts and principles of information search and information management	• Demonstrate sufficient understanding on the main concepts and principles of information search and information management	• Demonstrate partially understanding on some main concepts and principles of information search and information management	• Demonstrate partially understanding on some main concepts and principles of information search and information management	• Unable to demonstrate understanding on some main concepts and principles of information search and information management
Evaluation of search engines	• Able to thoroughly measure the effectiveness and efficiency of search engines • Can provide reasons of performances of search engines	• Able to thoroughly measure the effectiveness of search engines • Can provide some reasons of performances of search engines	• Able to mostly measure the effectiveness of search engines	• Able to partially measure the effectiveness of search engines	• Unable to measure the effectiveness of search engines
Processing of web documents	• Can describe and explain the major steps in processing of web documents that facilitates information search	• Can describe the major steps in processing of web documents that facilitates information search	• Can describe most of the major steps in processing of web documents that facilitates information search	• Can describe some steps in processing of web documents that facilitates information search	• Cannot describe the steps in processing of web documents that facilitates information search
Querying methods	• Can effectively and correctly formulate	• Can correctly formulate most	• Can correctly formulate some keyword	• Can formulate some keyword search, structured queries and multimedia search or	• Cannot formulate keyword search, structured

	Excellent (A)	Good (B)	Satisfactory (C)	Marginal Pass (D)	Fail (F)
	keyword search • Can effectively and correctly formulate structured queries • Can effectively and correctly multimedia search • Can effectively and correctly use advanced features of search engines	keyword search • Can correctly formulate most structured queries • Can correctly multimedia search • Can correctly use most advanced features of search engines	search, structured queries and multimedia search • Can correctly use most advanced features of search engines	use some advanced features of search engines	queries, multimedia search nor use advanced features of search engines
Search engine applications	• Can describe and explain many latest applications of information search	• Can describe many latest applications of information search	• Can describe some latest applications of information search	• Can describe limited number of applications of information search	• Cannot describe any latest applications of information search
Data management	• Can design and implement a relational database	• Can design and implement a mostly correct a relational database	• Can design and implement a partially correct relational database	• Can design a partially correct relational database	• Cannot design a relational database

Course Content and CILOs Mapping:

Content		CILO No.
I	Characteristics of Information	1, 2, 7
II	Web Document Search	2, 4, 5, 7
III	Audio, Video and Image Search	1,2, 3
IV	Case Studies and Applications	1, 2, 3, 4, 5, 6, 7
V	Searching and Managing Enterprise Data	1, 2, 3, 6

References:
- M. Levene, An Introduction to Search Engines and Web Navigation, **2nd Edition, Wiley, 2010.**
- R. Elmasri and S. Navathe, Fundamentals of Database Systems, **7th Edition, Addison-Wesley, 2015.**
- C. Manning, P. Raghavan and H. Schutze. Introduction to Information Retrieval, Cambridge University Press, 1st Edition, 2008.
- I. Witten, Web Dragons: Inside the Myths of Search Engine Technology, Morgan Kaufmann, 2010.

Course Content:

<u>**Topic**</u>

I.   Characteristics of Information
       A.   Textual information
            Structured, semi-structured, and unstructured information
       B.   Multimedia information
             Images, graphics, video information, audio information
       C.   Storage mechanisms
       D.   Metadata properties

II.   Web Document Search
       A.   Search engine features and advanced usage
       B.   PageRank algorithm and Google search
       C.   Elements of information retrieval
       D.   Browsing and relevance feedback
       E.   Semantic web

III.   Audio, Video and Image Search
       A.   Query by example
       B.   Content-based and tag-based search
       C.   Web image and video search
       D.   Query by humming and MIDI search

IV.   Case Studies and Applications
       Popular applications such as Google Earth, YouTube, Book Search, Blog Search, Patent Search, and Google Directory will be examined.

V.   Searching and Managing Enterprise Data
       A.   Modelling and representing enterprise data
       B.   Relational database structure
       C.   Elementary relational data operations
       D.   Elementary structured query language for retrieval
       E.   Basic concepts of normalization
       F.   Basic concepts of data mining and data warehouse