Information Management Domain Scope

1. Tools and techniques for efficient data modeling, collection, organization, retrieval and management
2. Extracting information from data to make data meaningful to the organization
3. Developing, deploying, managing and integrating data and information systems to support the organization
4. Safety and security issues associated with data and information
5. Tools and techniques for producing useful knowledge from information

Information Management Subdomains

01 History and overview
Minimum learning time: 1 hour
Competencies:
   a. Explain how data storage and retrieval has changed over time.
   b. Explain the advantages of a database approach compared to traditional file processing.
   c. Explain how the growth of the internet and demands for information for users outside the organization (customers and suppliers) impact data handling and processing.
   d. Give a brief history of database models and their evolution.

02 Data-information Concepts
Minimum learning time: 6 hours
Competencies:
   a. Explain the role of data, information, and databases in organizations.
   b. Differentiate and use key terms such as: information, data, database, database management system, metadata, and data mining.
   c. Define data quality, accuracy and timeliness, and explain how their absence will impact organizations.
   d. Describe mechanisms for data collection and their implications (automated data collection, input forms, sources).
   e. Explain basic issues of data retention, including the need for retention, physical storage, backup and security.

03 Data modeling
Minimum learning time: 7 hours
Competencies:
   a. Design Entity Relationship diagrams based on appropriate business rules for a given scenario.
   b. Describe the relationship between a logical model and a physical model.
   c. Explain importance of database constraints.
   d. Design a physical model for the best performance including impact of normalization and indexes.
   e. Compare and contrast the differences and similarities between the relational and the dimensional data modeling (OLTP vs OLAP).

04 Database query languages
Minimum learning time: 9 hours
Competencies:
   a. Create, modify and query database objects using the Structured Query Language (SQL).
   b. Filter and sort data using various clauses including where, order by, between, like, group by and having.
   c. Use joins to select data across multiple tables.
   d. Use embedded SQL queries.
   e. Perform calculations in a query using calculated fields and aggregate functions.
   f. Create updatable and non-updatable views.

05 Data organization architecture
Minimum learning time: 8 hours
Competencies:
   a. Demonstrate select, project, union, intersection, set difference, and natural join relational operations using simple example relations provided.
   b. Compare and contrast relational databases concepts and non-relational databases including object-oriented, XML, NewSQL and NoSQL databases.
   c. Explain the relationship between functional dependencies and keys and give examples.
   d. Define data integrity and provide examples of entity and referential integrity.
   e. Explain how data fragmentation, replication and allocation affect database performance.

06 Special-purpose databases
Minimum learning time: 2 hours
Competencies:
   a. Describe major concepts of object oriented, XML, NewSQL and NoSQL databases.
   b. Demonstrate an understanding of online analytical processing and data warehouse systems.
   c. Describe methods of data mining and what insights may be gained by these methods.

07 Managing the database environment
Minimum learning time: 5 hours
Competencies:
   a. Distinguish between data administration and database administration.
   b. Describe tasks commonly performed by database administrators.
   c. Create and manage database users, roles and privileges.
   d. Explain the concept of database security and backup/recovery.
   e. Discuss the importance of metadata in database environment.
**BITM Outcomes for ITMD 421**  
Bachelor of Information Technology and Management graduates should be able to:

(b) Analyze a problem and identify and define the computing requirements appropriate to its solution  
(c) Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs  
(e) Recall and discuss professional, ethical, legal, security and social issues and responsibilities  
(h) Recognition of the need for and an ability to engage in continuing professional development  
(i) Use current techniques, skills, and tools necessary for computing practice  
(j)(2) An ability to use and apply current technical concepts and practices in the core information technology of information management  
(m) Describe and apply best practices and standards

**BITM Outcomes to be assessed in ITMD 421, Fall of 2016**  
Bachelor of Information Technology and Management graduates should be able to:

(c) Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs  
(h) Recognition of the need for and an ability to engage in continuing professional development  
(i) Use current techniques, skills, and tools necessary for computing practice