PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(100-400 LEVEL)

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- New course with supporting documents
- Add existing course offered at another campus
- Expiration of a course
- Change in course number
- Change in course title
- Change in course credit/grade

PROPOSED:

Subject Abbreviation: IST
Course Number: 270
Long Title: Data and Information Management
Short Title: Data and Information Management

CREDIT TYPE

1. Fixed Credit Cr. Hrs.: 3.0
2. Variable Credit Range: Minimum Cr. Hrs. (Check One):
   - Yes
   - Or
   - No
3. Equivalent Credit:
   - Yes
   - No
4. Thesis Credit:
   - Yes
   - No

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
4. Credit by Examination
5. Designated Required
6. Special Fees

TERMS OFFERED: Check All That Apply

- Summer
- Fall
- Spring

CAMPUS(ES) INVOLVED

- Calumet
- Cont Ed
- Ft Wayne
- Indianapolis
- N Central
- Tech Statewide
- W Lafayette
- Indianapolis

DESCRIPTION (INCLUDE REQUIREMENTS):

IST 160 & IST 203. This course provides the student with an introduction to the core concepts in data and information management. It is centered around the core skills of identifying organizational information requirements, modeling them using conceptual data modeling techniques, converting the conceptual data models into relational data models and verifying its structural characteristics with normalization techniques, and implementing and utilizing a relational database using a database management system. This course will also include coverage of basic database administration tasks, how large-scale packaged systems are highly dependent on the use of a Database Management System (DBMS) and data and information management technologies.

Calumet Department Head: [Signature] Date: 10/29/09
Calumet School Dean: [Signature] Date: 10/29/09

Ft Wayne Department Head: [Signature] Date: 10/29/09
Ft Wayne School Dean: [Signature] Date: 10/29/09

Indianapolis Department Head: [Signature] Date: 10/29/09
Indianapolis School Dean: [Signature] Date: 10/29/09

North Central Department Head: [Signature] Date: 10/29/09
North Central Chancellor: [Signature] Date: 10/29/09

West Lafayette Department Head: [Signature] Date: 10/29/09
West Lafayette College/School Dean: [Signature] Date: 10/29/09

OFFICE OF THE REGISTRAR
Learning Objectives

Student will:
1. Learn to understand the role of databases and database management systems in managing organizational data and information.
2. Learn to understand the historical development of database management systems and logical data models.
3. Understand the role of information requirements specification processes in the broader systems analysis & design context.
4. Learn to use at least one conceptual data modeling technique (such as entity-relationship modeling) to capture the information requirements for an enterprise domain.
5. Learn to link to each other the results of data/information modeling and process modeling.
6. Learn to design high-quality relational databases.
7. Learn to understand the purpose and principles of normalizing a relational database structure and to design a relational database so that it is at least in 3NF.
8. Learn to implement a relational database design using an industrial-strength database management system, including the principles of data type selection and indexing.
9. Learn to use the data definition, data manipulation, and data control language components of SQL in the context of one widely used implementation of the language.
10. Learn to perform simple database administration tasks.
11. Learn the concept of database transaction and apply it appropriately to an application context.
12. Learn to understand the basic mechanisms for accessing relational databases from various types of application development environments.
13. Learn to understand the role of databases and database management systems in the context of enterprise systems.
14. Learn to understand the difference between on-line transaction processing (OLTP) and online analytic processing (OLAP), and the relationship between these concepts and business intelligence, data warehousing and data mining.
15. Learn to create a simple data warehouse ("data mart").
16. Learn to understand how structured, semi-structured, and unstructured data are all essential elements of enterprise information and knowledge management. In this context, the students will learn the principles of enterprise information and knowledge management.

Topics

• Database approach
• Types of database management systems
• Basic file processing concepts
• Physical data storage concepts
• File organizations techniques
• Conceptual data model
  o Entity-relationship model
  o Object-oriented data model
  o Specific modeling grammars
• Logical data model
  o Hierarchical data model
  o Network data model
  o Relational data model
    • Relations and relational structures
    • Relational database design
Mapping conceptual schema to a relational schema
• Normalization
• Physical data model
  o Indexing
  o Data types
• Database languages
  o SQL: DDL, DML, and DCL
• Data and database administration
• Transaction processing
• Using a database management system from an application development environment
• Use of database management systems in an enterprise system context
• Business intelligence
  o On-line analytic processing
  o Data warehousing
  o Data mining
  o Enterprise search

Discussion

• The course still has a strong focus on traditional data management: conceptual data modeling (using ER (Entity Relationship) modeling as the primary technique), logical data modeling using the relational data model (including ER - relational conversion and normalization), and physical database implementation and manipulation using SQL.

• It is essential that the information requirements specification processes are firmly linked to the organizational SA&D (Systems Analysis & Design) processes and that students understand the role of conceptual data modeling as an integral part of the process of making sense of the domain.

• The focus on the physical data model and the DBA (Data Base Administrator)-level work on database implementation has been reduced to give more time on improved understanding of the role of databases in the enterprise application context and various business intelligence topics, including enterprise search. Still, the students should understand the basic nature of the DBA tasks and be able to make intelligent decisions regarding DBMS choice and the acquisition of DBA resources.

• It is critically important that the students will fully understand how dependent various large-scale packaged systems, including ERP (Enterprise Resource Planning) systems are on relational databases and how strongly success in maintaining them and in supporting their use in organizations is dependent on understanding data structures and data manipulation with SQL.

• The course should provide a practical understanding of how relational databases are used to support web-based applications.