Syllabus for HIMT 425

Contact Information

Refer to the Welcome page for instructor contact information.

Course Description

The course introduces the elements of the data warehouse development methodology (design, acquisition, management, analysis, query, mining, and visualization), focusing on serving the informational and analytical needs of an enterprise. It examines the concepts of the data warehouse and the data-mart from various points of view (purpose, architecture, utilization, and security) and addresses the process of creating a data warehouse/data-mart solution from identifying an enterprise's informational and analytical needs to producing business intelligence (BI) by extracting useful information from the data warehouse using data mining methods and models. The course also examines the issues of data warehousing effectiveness in supporting strategic decision making. Topics include:

- Decision support systems
- Data warehouse architecture and design
- Data acquisition
- Data-marting
- Software and hardware requirements
- Security and performance
- Data analysis
- Data mining

Learning Objectives

After completing this course, you will be able to do the following:

- Identify the most important informational and analytical needs of an enterprise, and develop a data warehouse solution that serves these needs.
- Use the data warehouse solution to perform simple data mining tasks.
- Re-engineer the operational database(s) of a given enterprise and provide a data warehouse design focused on addressing the most important informational and analytical needs of the enterprise.
- Apply specific design techniques (data partitioning; denormalization; multidimensional, star, and snow-flake design models) to address the data structuring challenges of the data warehouse development process.
- Address the challenges of data acquisition and the ETL (Extract/Transform/Load) process.
- Provide BI by extracting useful information from the data warehouse.
- Use analysis and data mining tools: Online Analytical Processing (OLAP), Relational OLAP (ROLAP), Multidimensional OLAP (MOLAP), Hybrid OLAP, Decision Support Systems (DSS), Executive Information Systems (EIS), and others.
- Assess the effectiveness and usability of data warehousing solutions.
- Apply one or more basic data mining techniques to identify frequent patterns, associations, and correlations in the data.
- Apply one or more basic data mining techniques to make categorical predictions on new incoming data.
- Create, populate with data, and extract useful information from a data warehouse.
- Address the challenges of using data warehousing in strategic decision making, calculate the costs, and name the benefits and limitations of such an approach.

Course Materials

Required Textbook

Han, Jiawei, Kamber, Micheline, and Pei, Jian. *Data Mining: Concepts and Techniques,* 3rd ed. Morgan Kaufmann, 2011.

Optional Texts

- Witten, Ian H., Frank, Eibe, Hall, and Mark A. *Data Mining: Practical Machine Learning Tools and Techniques*, 3rd ed. Morgan Kaufmann, 2011.
- Tan, Pang-Ning, Steinbach, Michael, and Kumar, Vipin. *Introduction to Data Mining*. Addison-Wesley, Pearson Education Inc., 2006.
- Roiger, Richard J., Geatz, Michael W. *Data Mining: A Tutorial Based Primer*. Addison-Wesley, 2003.

Website Resources

The following websites provide links to additional learning materials (e.g., PDF versions of the chapters, PowerPoint decks, and errata sheets) for the text.

Illinois.edu: Data Mining: Concepts and Techniques, 3rd ed.

Elsevier: Data Mining: Concepts and Techniques, 3rd ed.

Course Activities and Assessments

Please see the course calendar for due dates.

Quizzes

The quizzes can be found on the course site under the Quizzes tab. They account for half of your grade in this course and can be quite challenging to work through. Please let your instructor know if you need help, or use the Discussions area to post your questions and reach out to the other students in the class for help and feedback.

Lecture Quizzes

Some of the commentaries include quizzes to assess your understanding of the material.

Discussions

Share questions or ideas about the readings in your textbook, the course materials, or quizzes. Reply to your classmates' posts.

Exams

There will be one comprehensive final exam. No make-up exams will be given.

Extra Credit Assignments

You can earn as much as 10% applied to your final grade by working on extra credit assignments. The extra credit assignments will be individualized and offered upon request. The first extra credit assignment is worth 4%; the second is worth 6%. Please let your instructor know if you are interested in working on an extra credit assignment. Completed extra credit will be submitted via Dropbox.

Grading

This is how the work in the course will be graded:

- To receive full credit, all work must be submitted on time.
- To be acceptable for grading, all work must be neat, readable, and professional looking. Work that fails to do so will be assigned a score of zero.
- All work is due as indicated in the course calendar. No late work will be accepted.
- Missing work will receive a grade of 0.

Final Course Grade

The final course grade will be calculated as follows:

50% Quizzes
10% Participation in the weekly discussions
40% Final Exam
10% Extra Credit Assignments (provided by instructor on request)

Technical Support

Please contact UW-Extension for technical support. The toll-free phone number is 877-724-7883; email techsupport@learn.uwsa.edu.