Enterprise Data Analytics
ITP 499x (2 Units), Fall 2007

Objective   While the increased capacity and availability of data gathering and storage systems have allowed enterprises to store more information than ever before, most organizations still lack the ability to effectively consolidate, arrange and analyze this vast amount of data. This course will explore the theory and practice of two major areas –
- Data warehouses for Enterprises
- Business Intelligence for Enterprise Resource Planning Systems (ERP)

After completing the course, students will be able to
- Describe the components of a Enterprise data warehouse
- Model the relational database required for an enterprise data warehouse
- Extract, cleanse, consolidated, and transform heterogeneous data into a single enterprise data warehouse
- Analyze data to generate information and knowledge that lead to informed decisions for businesses

Show how ERP business intelligence can be derived from data warehouses

Concepts   *Enterprise Data warehouses* aim at physically framing multiple sources of data (e.g., databases and file collections) in an architecture that requires the mapping of data from one or more operational data sources to a target database management system (DBMS, e.g., Oracle) that supports the many decision making processes and business intelligence (BI) systems of an enterprise.

Business Intelligence for ERP is the user-centered process of exploring data, data relationships and trends - thereby helping to improve overall decision making for enterprises. This involves an iterative process of accessing data (ideally stored in the enterprise data warehouse) and analyzing it, thereby deriving insights, drawing conclusions and communicating findings.

Statistical methods for data mining. Use of clustering techniques for discovering trends.

Instructor   Nitin Kale, kale@usc.edu

Office   OHE 412, 213.740.7083

Office Hours   1 – 4 W

Grader   TBA

Prerequisite   ITP320x or ISE 382

Lecture/Lab   2 – 5 p.m. T | KAP 160

Class web site	blackboard.usc.edu

Textbook	No text book Read lecture notes Assigned readings

Grading   The final grade will be based upon the total percentage earned. The weight of graded material during the semester is listed below:

Homework	30%
Midterm	25%
Final Exam	30%
Final Project	15%
Total	100%

Policies

- Projects turned in after the deadline will automatically have 2 points per day deducted. No projects will be accepted after 1 week beyond the project's original due date.

- No make-up exams (except for medical or family emergencies) will be offered nor will there be any changes made to the Final Exam schedule.

- "The School of Engineering adheres to the University's policies and procedures governing academic integrity as described in SCampus. Students are expected to be aware of and to observe the academic integrity standards described in SCampus, and to expect those standards to be enforced in this course."

- "Any Student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213)740-0776."

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Course Outline

Week 1 – Introduction
- What is Business Intelligence for large enterprises
- Why do we need Enterprise Data Warehouses?
- What is Data mining in ERP?

Week 2 – Relational Database review
- Database Normalization
- Denormalization of tables
- Transaction databases vs data warehouses

Week 3 – SAP Business Information Warehouse
- Differences between traditional star schema and SAP BW star schema
- Modeling and creating the InfoCube (star schema) in SAP Administrator Workbench

Week 4 – Data Extraction, Transformation and Loading (ETL) in SAP BW
- Extraction from data sources such as SAP R/3
- Loading transactional data
- Direct and flexible updating
- Loading master data
- Third party extraction tools
- Extracting from databases using DB connect
- Flat file extraction

Week 5 – Business Content in SAP
- Business area specific modeling and tools
- Adopting and modifying preconfigured InfoCubes derived from ERPs

Week 6 – Administration of InfoCubes and Aggregates: Data from ERP
- Creating InfoObjects
- Building InfoCubes
- Defining and using Persistent staging areas
- Managing InfoCubes
- Aggregation of transactional data

Week 7 – Data Marts
- What are Data marts?
- Creating ODS (Operational data store objects)

Week 8 – Virtual cubes and MultiProviders

Week 9 – Midterm Exam

Week 10 – Introduction to Business Intelligence with SAP Business Analyzer (BEx)
- SAP BIW reporting
- Navigating in reports
- Using the BEx Business Analyzer
- Designing queries in the Query Designer
- Using InfoProviders and InfoObjects for queries

Week 11 – Calculated and restricted key figures in BEx
- Properties of key figures and facts

Week 12 – Characteristics in an ERP
- Properties and attributes of characteristics
- Integrating hierarchies into reports
- Creating user-defined hierarchies

Week 13 – Query Properties
- Query properties
- Document Integration
- Exceptions
- Conditions

Week 14 – Web Application Designer
- BEx Web App Designer
- Web Items
- Customizing the context menu
- Modeling and enhancing web templates
- Workbooks

Week 15 – Final Project - Capstone Project Discussion

Week 16 – Final Exam