

ITIS 5160 Course Syllabus



Applied Databases, Spring 2009

Woodward Hall 130, Wednesday 6:30-9:15pm

Instructor: **Xintao Wu**
Office: **Wood 333E, (704) 687-8586**
Email: [xwu at uncc.edu](mailto:xwu@uncc.edu)
URL: <http://www.sis.uncc.edu/~xwu>
Prerequisite: N/A
Office Hours: 5:00-6:30pm, Wednesday

Course Material (required):

Raghu Ramakrishnan, Johannes Gehrke. Database Management Systems(3rd) McGraw Hill, June 2003, ISBN: 0072465638. online textbook information is [here](#)

Teaching Assistant

Ling Guo (lguo2 at uncc.edu) 3pm-5pm Thursday & 10am-12pm Friday

Woodward Hall 300

Grading

Quiz	10%	Term Project	40%
Midterm	20%	Final Exam	30%

Course Description

Identification of business database needs; requirements specification; relational database model; SQL; E-R modeling; database design, implementation, and verification; distributed databases; databases replication; object-oriented databases; data warehouses; OLAP; data mining; security of databases; vendor selection; DBMS product comparison; database project management; tools for database development, integration, and transaction control.

Useful links

[Java tutorial](#)

[JDBC tutorial](#)

[Oracle SQL tutorial](#)

Syllabus for ITIS 5160 (Spring 2009)

(This will be changed frequently, you should check this page at least once a week)

Date	Topics	Reading Assignment (before class)	Handout
Jan 14	Introduction	ch.1	overview ch1 bookstore
Jan 21	ER model	ch.2	ch2 homework 1 (solution)
Jan 28	Relational model	ch.3	ch3 dept homework 2 (solution)
Feb 4	SQL	ch.5	ch5
Feb 11			sailor
Feb 18	lab	SQL reference PL/SQL reference	lab assignment (solution)
Feb 25	DB programming and JDBC	ch.6 & 7	JDBC jdbc and servlet setup
March 4	midterm		Sample-midterm-solution
March 11 (spring break, no class)			midterm solution
March 18	Normal forms	ch. 19	ch19 homework3 answer
March 25	Data warehouse conceptual design	case study reading (section 3)	data warehouse overview sales
April 1	Data warehouse physical design	design reading (ch1-3,6-8,10)	DW-design
April 8			bitmap , B-tree , query optimization

April 15	query optimization/indexing	ch. 12	bitmap paper (not required)
April 22	DBA and database tuning project presentation review	DBA reading	data warehouse sample questions
May 2 (11:30-2:30pm)	final		

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Project for ITIS 5160

(The description here may change over time. It is your responsibility to check this page for updates and changes when you do your project.)

The group list is [here](#)

General:

This is a group project, each group consisting 3-4 students The first part is to design, implement and query a database (or information) system for end users of an "enterprise" on Oracle (OLTP oriented). The second part is to build a data warehouse for analysts and to perform OLAP analysis over your data warehouse. You will need to do this as stated (and required) by the following. You are expected to devote at least 4-6 hours each week for this project. For those who can not handle programming languages (java or C++) very well now, it is your responsibility to learn and catch up by yourself --- In that case, you need spend even more time.

Steps

- Form your group or/before **Jan 28**. Note there is no extra credit for forming a group of less than 3 students although such groups are allowed. Send team member names to TA.
- A topic selection for the first part is due on **Feb 25**, you need to submit a description of an enterprise as well as the corresponding ER diagrams. The enterprise of your choice should approximately have 5-8 entity sets and 6-8 relationship sets. All entity sets should be somehow directly or indirectly related. You need also specify the functions (10) which you are expected to implement in your system. In your report, you need to include requirement analysis, ER, relation scheme mapped from ER diagram, and SQLs to implement your functions.ome enterprise examples are as following:
 - The internet shop, see description Appendix A in text book.
 - Online banking
 - College information system
 - Online bookstore
 - Online air ticket reservation
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- You need create a relational database with your schema using Oracle, insert some necessary tuples into your relations, implement queries (as well as some insertion functions). **The electronic script file is due on March 18. The parts on triggers and stored procedures (if any), and physical database design (like index) will be included in your final report.**
- You need implement a graphical user interface , e.g., by Java , C++ ,VB, HTML or any other appropriate approach to implement your system. Show your demo to the instructor before **April 22**.
- The conceptual design and physical design of your second part as well as updated requirement analysis are due on April 15. (optional)
- Prepare your final project report which may contain the revised version of all the previous reports. The final report will due on **May 2**.
- Apart from your final report, **I need one-page private statement from each student to specify the responsibilities and contributions of your group members in detail. Your grades will be varied based on the contributions.**

Prepare your final project report which may contain the revised version of the previous reports.

Specifically, you may include the following sections:

- Introduction
- Requirement analysis for DB
- ER design for DB
- Relational DB design
- Physical DB design.
- GUI design for DB
- Requirement analysis for DW
- Logical design for DW
- Physical design for DW (conceptual)
- Conclusion and future work.

In ER design and Relational DB design, please specify the constraints which can not be captured by ER model or relation model. In Normalization, please check the norm form of your tables and decompose if necessary. In physical DB design, discuss whether you need to create index to improve performance. In GUI design, please describe concisely the techniques you applied and you may include several snapshots of your system. In conclusion and future work, please discuss how to improve if this is a real-life project.

Although this is for a group project (a lot collaboration), I encourage every student do this separately first following the above step before your group meeting. You should be expected to have the ability to design and implement a small(or even medium)-sized information system by yourself when you finish this course.

Research Project

Students who are contemplating doing doctoral research may consider doing a research project instead of the above. However, you need to discuss your topic and get the permission from the instructor before **Jan 28**.