

Approval: 9th Senate Meeting

Course Name:	Applied Databases Practicum
Course Number:	CS 207
Credits:	0-0-3-2
Prerequisites:	IC150 Computation for Engineers
Intended for:	UG
Distribution:	Compulsory for CSE; CS elective for EE and ME
Semester:	3 rd

Preamble:

The new curriculum calls for a sequence of 3 Practicum courses for CSE, viz. CS207 Applied Databases Practicum, CS307 Systems Practicum and CS308 Large Applications Practicum. The erstwhile CS211 Networks and Database Practicum included both networks and databases tools and programming. Now, the networks material is shifted to CS307 and CS204 focusses only on database applications.

Tentative sequencing:

Semester 3 – CS207 Applied DB Practicum, followed by CS204 Introduction to Databases

Semester 4 – CS307 Systems Practicum, followed by CS3xx Introduction to Distributed Communicating Processes electives on networks and OS

Semester 5 – CS308 Large Applications Practicum, in conjunction with electives on software engineering, compiler construction, etc.

Course Outline:

The students will learn how to build useful applications involving databases with GUI for access. Learning will include basics of SQL (table schema, queries, indexing), form/report GUI design, UML diagrams, web-based applications. Skills will include open-source tools such as GUI builders, HTML, PHP, MySQL, Linux, Perl or Python, measuring the efficiency of applications. Exercises to include handling very large data (>100 MB table), making applications tolerant to network problems, use of colours and online help in GUI design.

Course Modules:

A few lab lectures (8 hours spread over the semester):

- Architectures of DB applications: Client-server; UI-Business logic-DBMS; Browser UI-Web server-Business logic-DBMS.
- Introduction to SQL
- Introduction to E-R modelling and MVC
- Transactions – what, how and when?

- Introduction to a scripting language, eg PHP, Python
- Introduction to HTML and especially HTML5
- Introduction to Javascript and Ajax/Comet
- Introduction to NoSQL

Lab assignments (listed below) require 3 hours in the lab, preceded by at least 3 hours at home. The weekly assignments are stage-wise demonstrations of the evolution of a mini-project – stages are as follows:

- Week 1-2 Choice of mini-project – a useful web-based tool.
- Week 3-4 Designing the data model and table schemas, testing the tables manually.
- Week 5-6 Design the UI flow – the user view.
- Week 7 Creating the GUI forms and reports.
- Week 8-9 Putting together the Web UI flow with the appropriate data access.
- Week 10 Basic tool ready with full functionality
- Week 11 Improving UI using javascript and HTML5 features.
- Week 12 Using AJAX for better user-interaction.
- Week 13 Substituting portions of the data model using NoSQL databases

Textbooks:

This course will use web-resources to cover course topics.