**ABET Course Syllabus – CS 1222**

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| **Code** | CS 1222 | **Credits** | 3 |
| **Title** | Introduction to Relational Databases | **Coordinator** | Chengyu Sun |

**Course Information**

1. **Catalog Description:** An introduction to relational databases and the SQL; database design using Entity-Relationship, relational, and object-oriented data modeling; database implementation; use of SQL, including selection, join, subquery, aggregation, and transaction. Graded ABC/NC.
2. **Prerequisites:** CS 1010, Computer literacy.
3. **Contact Hours**: Lecture 2 hours, laboratory 3 hours.
4. **Required/Elective:** This course is required in the BS program.

**Textbook**

* Gary Randolph and Jeffrey Griffin. *SQL Essentials*, Franklin Beedle and Associates, 2004.
* Alan Beaulieu. Learning SQL: Master SQL Fundamentals, O'Reilly Media, 2009

**Course Goals**

The Student Learning Outcomes that are addressed by the course are:

* SLO1: Students will be able to apply concepts and techniques from computing and mathematics to both theoretical and practical problems.
* SLO 4. Students will have a fundamental understanding of computer systems.
* SLO5. Students will have the training to analyze problems and identify and define the computing requirements appropriate to their solutions.

At the end of the course, students are able to

* Set up and use at least one mainstream database management system.
* Use the SQL query language to express compound search conditions, combine and process data from multiple columns or tables, and format the results into user-friendly reports.
* Design and implement a database schema in 3rd Normal Form and improve an existing database schema by normalization.

**Topics Covered**

* Introduction to relational database systems and SQL
* Selections
* Joins
* Aggregations
* Functions and set operations
* Subqueries
* Table creation and updates
* Views
* Indexes
* Transactions
* Introduction to database design
* SQL query performance issues
* Data manipulation
* Table design
* Stored procedures
* Triggers
* Advance topics in SQL
* Introduction to NoSQL database
* MongoDB basics and functions
* Collection and documents
* Update, read and aggregation