**COURSE: WIIT - 7730 Database & SQL Foundations Syllabus**

**DESCRIPTION OF COURSE**

This course introduces the student to the fundamental concepts and techniques of relational database technology, structured query language, database design, and database management. Students perform hands-on labs with commercial software and databases based on real-world scenarios.

**STUDENT LEARNING OUTCOMES**

Upon successful completion of this course, student will be able to:

* Explain the purpose and function of a database system
* Define the components of a database system
* Explain the conceptual foundation of the relational model
* Explain the meaning and importance of indexing, keys, foreign keys and related terminology
* Explain the nature and background of normalization theory
* Review a non-normalized data file and explain how to normalize it
* Apply the normalization process to database design
* Define ACID, CRUD and the importance of these concepts
* Define the structured query language
* Create SQL statements for adding, modifying, deleting and processing data
* Create a relational database that is normalized and with primary & foreign keys
* Define the purpose and role of a data model
* Construct E-R Diagrams
* Describe what is meant by data governance, data consistency, data cleaning

**SOFTWARE**

Postgres Database hosted on a cloud service.

Columbus State provides an AWS Student Starter Account with $75 usage credit or an AWS Student Account (requires student credit card for overages) with $100 usage credit. The student may also use their own AWS personal account. The student may also use their own Azure personal account.

**TEXTBOOK, MANUALS, REFERENCES, AND OTHER READINGS**

*Sams Teach Yourself SQL in 10 Minutes, Ben Forta*

Pearson Education, Fourth Edition

ISBN-13: 978-0672336072

**UNITS OF INSTRUCTION & CLASS CALENDAR**

Week 1

Explain the purpose and function of a database system. Define the components of a database system. Create a student AWS account. Review AWS RDS tutorial for creating an instance of a Postgres database. Create a simple single table database. This week is for mechanics needed in later weeks.

Week 2 & 3

Explain the conceptual foundation of the relational model. Review several database examples on AWS and explain why the data is organized the way it is (no dupes, client data in separate table, transaction data in separate table…) Explain the meaning and importance of primary keys, foreign keys and related terminology especially related to our sample databases.

Week 4 & 5

Define the structured query language.

Create SQL statements for adding, modifying, deleting and processing data.

Define ACID, CRUD and explain the importance of these concepts.

Week 6 & 7 (8 as needed)

Define the purpose and role of a data model.

Construct E-R Diagrams.

Discuss Normalization as it relates to the examples. Normalize a non-normalized database.

Create a normalized database of your own design.

Week 8

Describe basic administrative and managerial DBA functions.

Explain the importance of concurrency control, security, backup and recovery.