

# ITIS 180B: DATABASE ESSENTIALS IN AMAZON WEB SERVICES

## Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2022
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Prerequisite:	ITIS 180A.
Strongly Recommended:	ENGL 101.
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Standard Letter

## Catalog Course Description

This course addresses cloud database management which supports a number of different approaches for storing data. In the course, students define, operate and scale both SQL and no SQL data storage solutions. This course considers factors that should be balanced during the design of a storage solution. Principles are applied by performing exercises using Amazon RDS and SQL to create and fill tables, retrieve and manipulate data. Object-based APIs are used to serialize objects to Amazon DynamoDB for no SQL solutions. Topics include automated backups, transaction logs, restoration and retention. 54 lecture hours.

## Course Objectives

- Describe how SQL and noSQL database web services can be used to store data
- Describe redundancies and their adverse effects
- Identify operations such as restrict, project, union, intersection, difference, divide, and join
- Design small databases with primary and foreign keys and other constraints to be enforced by the database management system (DBMS)
- Design databases by employing normalization rules, including supertypes and subtypes to reduce nulls and other rules to reduce redundancies
- Design and document databases by using connectivity, cardinality, entity-relationship diagrams, relational schemas, and data dictionaries
- Interact with object APIs to store and retrieve data in NoSQL database web services

## Major Course Content

- Introduction to files, databases and database management systems
- Amazon database web services, the Management Console, Regions and Availability Zones

- The relational database model
- Entity-relationship modeling with Amazon RDS
- Datatypes for numeric, character, and date data in tables and variables with Amazon RDS
- Scripts and SQL commands to create, alter, insert, update, delete and drop tables with Amazon RDS
- Working with Amazon DynamoDB
- File storage and retrieval with Amazon web services
- Object-based APIs for Amazon NoSQL web services
- Transaction management and concurrency control
- Managing backups and logs with Amazon web services. Restoration and retention policies with Amazon web services.

## Examples of Outside Assignments

Designing normalized tables

The one STUDENT table on the following page now has all the columns. That table violates the normalization rules described in Chapter 04 of the lectures.

Using the Amazon Web Services Console table format provided:

TABLE NAME COLUMN NAME DATATYPE KEY

(1) Set up the structure (table names, column names, datatypes, primary keys, any foreign keys) of several relational tables so the tables satisfy the first three rules of normalization for a relational database. This table has several violations of normal forms. One by one, find and resolve the 1NF violations, then solve any 2NF and 3NF violations. (2) Name the tables and columns according to Oracle's rules:

Names begin with a letter Names can include letters, numbers, underscore (\_), pound sign (#), and dollar sign (\$). No spaces, periods, hyphens, and other characters except those listed above.

Maximum of 30 characters.

Names are descriptive.

(3) Assign datatypes to the columns. Use one of the number datatypes only when arithmetic operations will be used on the column.

(4) In each table, indicate any primary key with PK after the column(s), and any foreign key(s) with FK after the column(s). With words, identify the table and columns (the PK) that the foreign keys reference. If more than one foreign key appears in any table, number the keys (e.g., FK1).

## Instruction Type(s)

Lecture, Online Education Lecture