Prefix and Course Number	**ISIT 360**
Course Title	**DATABASE APPLICATION DEVELOPMENT**

<div align="right">**Last Modified: Spring 2016**</div>

Course Learning Outcomes

By the end of this course, a student should be able to:

— Design and implement both SQL and non-SQL databases.
— Transform data between different text-based database formats—for example, SQL, delimited, JSON, and/or XML, for example.
— Write SQL and non-SQL queries that filter, sort, and summarize table data.
— Create reports, data-entry forms, and form-based navigation using standalone programs—for example, Access and Visual Basic for Applications; Access and Visual Basic; or Oracle with any Oracle application.
— Create web-based reports, data-entry forms, and form-based navigation via client/server coding—for example, HTML/MySQL/PHP.
— Understand the process for creating interactive maps built from geo-spatial databases.

Course Outline

1) **Build back-end tables**
   a) Design and implement tables with stand-alone database programs such as Access
   b) Design and implement tables with server-based databases—for example, MySQL; Oracle; and/or SQL Server
   c) Set field properties to validate data
   d) Enforce referential integrity between tables

2) **Make data portable**
   a) Structure of Portable Data
      i) SQL Query Text Files
      ii) Delimited Text Files
      iii) JSON Text Files
      iv) XML Text Files
   b) Transforming Data
      i) Normalization
      ii) Denormalization
      iii) Port data between different structures such as SQL, delimited, JSON, and XML
         (1) Use pre-built export/import processes
         (2) Shape data using Excel string functions

3) Design and implement front-ends with standalone programs such as Access
   a) Query back-end tables using SQL
   b) Create reports
   c) Create forms for data entry
   d) Design and implement form-based user interfaces
   e) Add functionality with scripting such as Visual Basic for Applications

4) Design and implement web-based front-ends
   a) View and edit data using HTML forms, SQL, and server-side code such as MySQL/PHP
   b) Search data using XML based query language such as FLOWR and/or XQuery
   c) Search data using No-SQL environments such as Mongo (JSON) and/or eXite (XML)

5) **Explore solutions for making interactive maps using geospatial databases**—for example, such as Google Map API; PostgreSQL and PostGIS; PostgreSQL and ArcGIS; and/or Microsoft SQL Server and ESRI ArcSDE