CS 201 – Database Theory and Design  
Credit Hours: 3  
Scheduled hours per week  
Lecture: 3  
Lab:  
Other:  

Catalog Course Description: Introduction to database structure, organization, and retrieval. Query languages, normalization, file structures, database security, and distributed database systems will be discussed.

Pre-requisites: CS 121 must be passed with a grade of C or better OR CIT 410 must be passed with a grade of C or better.

Co-requisites:

Course Learning Outcomes:  
Students should have an understanding of and be able to apply the following concepts:  
• To understand, design, build, maintain, and troubleshoot relational databases

Topics to be studied:  
• Database Systems  
• Data Models  
• The Relational Database Model  
• Entity Relationship Modeling  
• Advanced Data Modeling and Database Design Fundamentals  
• Creating Tables with SQL  
• Single Table Queries  
• Multi-Table Queries  
• Updating Data  
• Database Administration, and SQL Functions and Procedures  
• Database Design  
• Performance Tuning and Query Optimization  
• Business Intelligence and Data Warehousing  
• Big Data Analytics and NoSQL  
• Database connectivity and Web Technologies

Relationship of Course to Program or Discipline Learning Outcomes:  
Computer Science  
✔ Ability to understand and use elements of good programming style and best practices  
Understanding of programming paradigms, such as imperative, functional, and object oriented design  
✔ Ability to understand and use variables with different data types and control structures  
Ability to perform top-down design, use modular programming, string processing, elementary data structures, basic disk I/O, and recursion  
✔ Ability to use data structures and algorithms to represent data relationships, data manipulation, searching, sorting, and solving complex problems  
✔ Ability to design, configure, troubleshoot, and manage database tables, normalize data, and store and retrieve object attributes in a database
Relationship of Course to General Education Learning Outcomes:

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition and Rhetoric</td>
<td>Students illustrate a fundamental understanding of the best practices of communicating in English and meet the writing standards of their college or program-based communication requirements.</td>
</tr>
<tr>
<td>Science &amp; Technology</td>
<td>Students successfully apply systematic methods of analysis to the natural and physical world, understand scientific knowledge as empirical, and refer to data as a basis for conclusions.</td>
</tr>
<tr>
<td>Mathematics &amp; Quantitative Skills</td>
<td>Students effectively use quantitative techniques and the practical application of numerical, symbolic, or spatial concepts.</td>
</tr>
<tr>
<td>Society, Diversity, &amp; Connections</td>
<td>Students demonstrate understanding of and a logical ability to successfully analyze human behavior, societal and political organization, or communication.</td>
</tr>
<tr>
<td>Human Inquiry &amp; the Past</td>
<td>Students interpret historical events or philosophical perspectives by identifying patterns, applying analytical reasoning, employing methods of critical inquiry, or expanding problem-solving skills.</td>
</tr>
<tr>
<td>The Arts &amp; Creativity</td>
<td>Students successfully articulate and apply methods and principles of critical and creative inquiry to the production or analysis of works of art.</td>
</tr>
</tbody>
</table>

5/3/2016

Special requirements of the course:

You will need a computer with an Internet connection.

Additional information:

Prepared by: Charles Almond

Date: 10/20/2017