

## CMPSC 203

### Introduction to Spreadsheets and Databases

- Catalog Data: Introduction to Spreadsheets and Databases (3)  
Design, use, and programming of spreadsheets and databases with applications from a range of disciplines. Prerequisite: 2 entrance units in mathematics.
- Typical Textbook: “Excel 2007 Comprehensive Concepts and Techniques” and “Access 2007 Comprehensive Concepts and Techniques” from the **Shelly Cashman Series**, published by Course Technology.  
-Or-  
“Excel 2007 Comprehensive” and “Access 2007 Comprehensive” from the **GO! with Microsoft Office Series** published by Prentiss Hall.
- Course Objectives: CMPSC 203 is a course designed to illustrate problem solving using Excel, and Access. During class time students will be required to follow the instructor in creating and using Excel Workbooks and Access Databases. At the end of most class periods, students will be required to submit a file with their work. During class, students may be permitted to work in teams. Two types of outside assignments will also be required. The first type, labs, will give the students detailed expectations and instructions on how to accomplish the goal. The second type, projects, will give the overall goals and the students will be required to use their knowledge to decide how to accomplish these goals.
- Primary Course Outcomes: Upon completion of the course, students should possess the following skills:
- Problem Definitions: Given a problem, students should be able to describe the problem in their own words and to specify if an Excel workbook or Access database would be most appropriate to solve the problem. Students should also be able to sketch out a general layout of the worksheet or database.
  - Worksheet design: Given a problem description and example of the data, students should be able to design the worksheets and workbooks to solve the problem.
  - Excel Formula: Given a problem, students should be able to create formula using arithmetic operators and/or built-in functions to calculate the required results. Students should be able to use relative cell addressing, absolute cell addressing and mixed cell addressing as appropriate.
  - Excel Charts: Given a problem, students should be able to specify which chart type would best illustrate the required results and to select the appropriate data to implement this chart. Students should be able to create Pivot Tables and Pivot charts to allow dynamic representation of data.
  - Excel Functions: Given a problem, students can select and implement the functions. Students should be able to use the common functions such as SUM, MAX, MIN, and AVERAGE without assistance. Students should be familiar enough with the on-line help to be able to specify the problem so an unfamiliar function may be chosen and implemented.
  - What-If Analysis: Once a worksheet has been produced, students should be able to vary data in a logical manner to analyze how the results would vary. Students should be familiar Goal Seeking to implement varying one cell to obtain a specified value in another cell without assistance. Students also should be aware that Solver may be used for varying more than one cell to reach a specified value provided appropriate constraints have been applied.
  - Formatting Worksheets: Students should be able to apply basic formatting such as selecting different font size, background color, borders, etc. that will enhance the worksheet appearance and emphasize results.

- Database Design: Given a problem description and example of the data, students should be able to design tables to reduce redundancy, to determine what fields, or combination of fields should be the primary key, to specify appropriate data type and field size for all the fields, and to build relationships between tables.
- Database Forms: Given a database, students should be able to generate forms appropriate for data entry and data display. Students should be able to incorporate calculated fields, combo-boxes and subforms as needed.
- Database Reports: Given a database, students should be able to generate reports from 1 table and multiple tables and queries. Students should be able to modify the report in Design View to enhance the presentation of the data. Students should also be able apply grouping and use formula to display calculated or summary information.
- Database Queries: Given a database, students should be able to create queries to retrieve appropriate information from one or more tables. The students should also be able to create calculated fields from fields in the tables.
- Application Integration: Students should be able to incorporate Excel worksheets and Access Reports into word processing documents. Students should be able to import text data into an Excel worksheet and worksheet data into an Access Table.

Suggested Course Outline:

The following is a possible course outline assuming two 2-hour class meetings per week and using the Shelly Cashman series for a textbook.

Lecture	Material covered
1	Class introduction, review of syllabus and tentative schedule, Introduction to layout of an Excel Worksheet
2	Entering data into a worksheet, using sum function, using auto fill, creating an embedded chart
3	Entering formula, arithmetic operators and precedence, introductions to functions, formatting
4	Various chart types, importing data from web queries, text files, and web pages
5	What-if analyses, copying data to non-adjacent cells, absolute vs. relative cell addresses
6	Using ifs and nested ifs, creating static and dynamic web pages from worksheets, using spreadsheets in word documents
7	Employing financial functions, creating and using cell names, creating data tables, conditional formatting
8	Creating an amortization table, adding hyperlinks, protecting cells
9	Using Excel List features, creating a vlookup table
10	Creating and using templates, using formulae with multiple worksheets
11	Creating macros and customizing toolbars
12	Formula auditing, data validation, multi-variable problem solving
13	Adding trend lines, creating pivot tables and pivot charts, exporting data
14	Excel Exam
15	Introduction to databases, designing and creating a multi-table database, introduction to data types for fields, creating a simple report and auto form.
16	Querying the database, using parameter queries, creating cross-tab queries, using calculated fields in queries
17	Maintaining a database, modifying design and structure of database, appending data from other databases
18	Employing validation rules, enforcing referential integrity
19	Importing data from an Excel workbook, exporting data to other applications
20	Using grouping in reports, using design view to modify reports, adding textboxes for calculations, using data from multiple tables
21	Creating custom forms with calculated fields and combo boxes

22	Adding hyperlink and picture fields to databases
23	Creating forms with sub forms to view data
24	Creating macros and switchboards
25	Creating pivot tables and pivot charts
26	Creating reports with subreports and data from queries.
27	Creating forms with command buttons and multiple pages. Utilizing Access Tools to analyze table design, analyze the performance of the database, and to document the structure of the database.
28	Replicating databases, splitting databases
29	Introduction to SQL queries
30	Review

Relationship to Undergraduate Program Outcomes: N/A

Required Topics: See "Suggested Course Outline."

Class Format: Two lecture/labs per week. Each lecture/lab is 120 minutes.

Professional Component: N/A

Evaluation:

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