Prefix, Number and Name of Course:
ACM 613: Topics in Spreadsheets and Databases for Math and Science Professionals

Credit Hours: 1

In Class Instructional Hours: 1
Labs: 0
Field Work: 0

Catalog Description:
Prerequisite: Instructor Permission
Applications of spreadsheet and database software programming to solve real life problems in computational mathematics. Analysis of data to produce reports and presentations for diverse audiences.

Reasons for Addition:
The reason for addition of this course is to create a one-semester-hour core module in problem solving in professional, applied and computational mathematics using spreadsheet and database software. This course is in response to the fact that spreadsheets and databases are used extensively in business and industry.

Student Learning Outcomes:
Students will:

1. program and analyze data using different spreadsheet and database computing languages.
2. design and implement algorithms to analyze data using spreadsheet and database computing languages.
3. analyze, compare and contrast the advantages of disadvantages of different spreadsheet and database computing languages.
4. create reports and presentations using typesetting software.

Course Content References:

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<th>References</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>II, III, IV</td>
<td>1. Individual homework, assignments, examinations and/or computer projects.</td>
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<td>I,II,III,IV</td>
<td>2. Individual homework assignments, group work.</td>
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<tr>
<td>II,III,IV,V</td>
<td>3. Individual homework assignments, group work, examinations and computer projects.</td>
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<tr>
<td>III</td>
<td>4. Individual homework assignments, group work, examinations, portfolios and computer projects.</td>
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Course Content:

1. Storing data with spreadsheets and databases
   A. Capabilities and limits of spreadsheets and databases
   B. Structure of data in spreadsheets and databases
   C. Case studies in big data
### II. Performing calculation with spreadsheet and database software
- A. Formulas and visual basic (VBA) to create advanced spreadsheets
- B. Creating databases and using queries in databases
- C. Case studies and problem solving using databases and spreadsheets

### III. Presenting data with spreadsheet software
- A. Creating forms and presenting results with spreadsheet
- B. Creating reports from databases
- C. Case studies and example from business, industry, science and mathematics

### IV. Applications
- A. Applications of spreadsheets and databases to business, industry, science and mathematics.
- B. Analysis of benefits to business and industry from using spreadsheets and database software.

### V. Software for spreadsheets and databases
- A. Overview of commercial and open source software to create and program spreadsheets and relational databases.
- B. Cost-benefit analysis of software currently available.

**Resources:**

**Scholarships in the Field:**


Periodicals:

*SIAM Journal on Computing*
*Spreadsheets in Education Journal*

Electronic and/or Audiovisual Resources:

Open source spreadsheet software: [http://www.libreoffice.org/](http://www.libreoffice.org/)