CSC 232 Programming for Scientists and Engineers

1. CSC 232 Programming for Scientists and Engineers

2. **credit units**: 3  
   **contact hours**: 5

3. **Course Coordinator**: Kurt Voelker

4. **Textbook (or other required material)**: Material provided by instructor

5. a. **Course Description**: Computer programming, with an emphasis on procedural programming, taught using a language hosted by applications commonly used in science and engineering. Credit not allowed for CSC, CPE or Software Engineering majors. 2 lectures, 1 activity.

   b. **Prerequisite**: MATH 118 or equivalent.

   c. **Required/Elective/Selective Elective for CPE, CSC, EE, SE**

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6. a. **Course Learning Objectives**
This course will give the student experience in writing an running scripts written in the Python programming language using the Spyder IDE environment. The student will rapidly progress from coding to writing their own scripts, to modifying and adding features implemented using branching and looping methods of their own design. Upon completing the course, the student will understand and be able to:

   - Edit and run scripts using the Spyder IDE using the Python programming language.
   - Properly document scripts using comments.
   - Use single-entry/single-exit structured programming constructs.
   - Properly test scripts and user defined functions
   - Write Python scripts to solve typical engineering problems
   - Implement user defined functions to solve typical engineering problems.

   b. **Level at which Student Outcomes are addressed**
   ("B" = Basic level, "I" = Intermediate level, "A" = Advanced level)

   **For non majors**

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7. **Major Topics Covered: (number of lecture hours per)**
   - Computers and the programming environment used (2)
   - Data types, variables, constants, strings, arrays, matrices (4)
   - Branching with IF and/or SWITCH-CASE (4)
   - Looping with WHILE and FOR (4)
   - Writing user defined functions (4)
   - Using Numpy and Scipy Python modules (4)
   - Plotting using Python modules (4)
   - Numerical methods and approximation techniques (4)
   - Formatted output (2)