Introduction to Computer Programming in MATLAB for Engineers and Scientists

CSE 1221

Course Description:
Introduction to computer programming and problem solving techniques with applications in engineering and the physical sciences; algorithm development; programming lab experience.

Course Goals / Objectives:
Be competent with writing simple MATLAB programs performing numerical calculations
Be competent with use of basic constructs provided by high-level imperative programming languages: sequencing, selection, and iteration
Be familiar with algorithmic thinking
Be familiar with use of computational approaches to solving problems in science and engineering
Be familiar with using basic data structures such as arrays
Be familiar with procedural composition
Be exposed to computational science concepts, including simulation, optimization, and data analysis
Course Topics:

Introduction to computation, concept of algorithm

Variables, expressions and assignment

Selection statements: if, switch

Booleans, strings

Matrices and indexing

Loops: for and while; use of arrays

Graphing, input/output with files, scripts

Functions

Higher order operators on matrices

Review/exams

Grades Breakdown:

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
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<tr>
<td>Laboratory Assignments</td>
<td>30%</td>
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<tr>
<td>Two Midterm Examinations</td>
<td>25%</td>
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<tr>
<td>Final Examination</td>
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Designation:
Elective

Instruction Modes:
In Person (75-100% campus; 0-24% online)
### Representative Textbooks and Other Course Materials:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Year</th>
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<tbody>
<tr>
<td>Introduction to Scientific Computation and Programming</td>
<td>Daniel T. Kaplan</td>
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