PROBLEM SOLVING FOR ENGINEERING TRANSFER
CSIT 1300

Class Hours: 1.0 Credit Hours: 2.0
Laboratory Hours: 2.0 Revised: Fall 09

Catalog Course Description:

Application of computers to engineering problem solving. Introduction to computer mathematical tools, problem analysis, code formulation, engineering data plotting and simulations. Solutions of engineering problems using MatLab.

Entry Level Standards:

The entry-level student is expected to have familiarity with computers. The student must have math, writing, verbal and English language skills at the college-entry level.

Prerequisites:

None

Textbook(s) and Other Course Materials:

*An Engineer’s Guide to MatLab, 2nd Edition, Magrab, Azarm, Balachandran, Duncan, Herold and Walsh, Prentice Hall*

1 GB (minimum) Flash/Pen/Jump USB Storage Drive, Notebook.

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Intro to computers, computer components, Math concepts, Engineering Use of Computers, MatLab Development Editor and Environment, Lab Assignments</td>
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<tr>
<td>2</td>
<td>Variables, Scalar Data, Vectors and Matrices, Lab Assignments</td>
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<tr>
<td>3-4</td>
<td>Data Input/Output, Data retrieval and matrix generation, Lab Assignments</td>
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<tr>
<td>5-7</td>
<td>Program Flow, Functions, 2D Plots, Lab Assignments, Review</td>
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<tr>
<td>8</td>
<td>Midterm Test (Written and Lab Requirements)</td>
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<tr>
<td>9-11</td>
<td>3D Plots, Machine Elements, Dynamics and Vibration, Control Systems, Lab Assignments</td>
</tr>
<tr>
<td>12-13</td>
<td>3D Plots, Optimization, Thermal and Fluid Mechanics, Lab Assignments</td>
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II. Course Objectives*

A. Use terminology associated with the computers and programming for engineering applications. (III, VIII)

B. Demonstrate use of Mathematical and Plotting software, on-line resources and the PC microcomputer equipment. (II, III, IX)

C. Demonstrate a working knowledge of application software used in Engineering and Technology-based career areas. (IV, V, VI, VII, IX, X, XII)

D. Demonstrate proficiency in formulating problem solutions based on real-world data sets in engineering environments. (V, VIII, XI)

E. Demonstrate proficiency in using MATLAB software. (IV, V, VI, VII, IX, X, XII)

*Roman numerals after course objectives reference goals of the CSIT program.

III. Instructional Processes*

Students will:


2. Find resources and effectively use tutorials and other resources on the Internet. Technical Literacy, Communication, Transitional Strategy, Active Learning.


*Strategies and outcomes listed after instructional processes reference TBR's goals for strengthening general education knowledge and skills, connecting course work to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*
Upon successful completion of this course, the student should be able to:

1. Demonstrate proficient use of terminology associated with the computer science and data processing fields. (A,B,C,D,E)
2. Demonstrate an understanding of the use of hardware, firmware, and software technology. (A,B,C)
3. Demonstrate efficient use of the computer system and its operating environments. (A,B,C)
4. Use an engineering product and produce data output and graphs. (A,B,D)
5. Demonstrate computer problem solving in the engineering environment. (A,B,D)
6. Demonstrate proficient use of engineering software in problem solving, graphing, plotting and data manipulation. (B,C,D,E)
7. Enter programs and data to produce product outcomes and plots using MATLAB. (A,B,C,D,E)

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures:

There will be quizzes to access knowledge and proficiency of the products used. There will be a comprehensive midterm and final test. Grades are determined based on a total points accumulated process using the scale provided below.

B. Laboratory Expectations:

There will be a number of labs from each section. Lecture and Lab attendance is required. Assignments will be given and must be completed and handed in at the expected date and time. All assignments turned in late will be reduced by 50%. No assignment will be accepted more than one week late unless approved in advance by the lab instructor. Students must sign the rollsheet daily in both lecture and lab to be counted as in attendance.

C. Field Work:

N/A

D. Other Evaluation Methods:

N/A

E. Grading Scale:

93 -100%   A
88 – 92 %   B+
83 – 87%   B
78 – 82%   C+
73 – 77%   C
65 – 72%   D
Below 65%  F

VI. Policies:
A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. [NOTE: No differentiation is noted for excused/unexcused absences. These will be treated as an absence.]

B. Academic Dishonesty:

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions which may be imposed through the regular Pellissippi State procedures as a result of academic misconduct, the instructor has the authority to assign an F or a zero for the exercise or examination or to assign an F in the course.

C. Accommodations for disabilities:

Students who need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 134 or 126 or by phone: 694-6751 (Voice/TTY) or 539-7153. More information is available at www.pstcc.edu/departments/swd/

D. Other Policies:

**Computer Usage Guidelines:**

College-owned or -operated computing resources are provided for use by students of Pellissippi State. All students are responsible for the usage of Pellissippi State's computing resources in an effective, efficient, ethical and lawful manner.