Catalog Course Description:

Application of computers to engineering problem solving. Introduction to computers, operating systems, document preparation, structured programming, spreadsheet, use of the internet and engineering data plotting. Solution of engineering problems using existing software packages.

Entry Level Standards:

The entry-level student is not expected to have familiarity with computers. The student should be able to use a standard keyboard and maintain 10 words per minute error-free typing rate. The student must have math, writing, verbal and English language skills at the college-entry level.

Corequisite:

MTH 1020 or equivalent

Textbook(s) and Other Reference Materials Basic to the Course:

Engineering Problem Solving with MATLAB, by O. M. Etter, Prentice Hall.

Microsoft Word, Microsoft Excel, and Windows 95, Course Technology. (3 books per packet) ISBN 0-7600-8024-0

HD 3 2” Diskettes--Quantity 3
Notebook, pencils, pen, paper 8 1/2 x 11 (white and lined).

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 computer, computer components, Intro to operating systems, Engineering Use of Computers, Environments (DOS, Windows, UNIX, VAX), eMail, Internet, Lab Assignment</td>
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<tr>
<td>2</td>
<td>DOS, Windows, eMail, Internet, Lab Assignment</td>
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<tr>
<td>3-4</td>
<td>Intro to Word Processing, Lab Assignment, Test</td>
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<tr>
<td>5-7</td>
<td>Spreadsheet Terminology, Spreadsheet design, Excel Functions, Plots, Lab Assignments, Review, Midterm</td>
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8-11 Programming Concepts, QuickBASIC commands, structure, design, Lab Assignments, Test

12-14 Intro to MATLAB, arithmetic operations, Engineering/Statistical Applications, Measurements, Lab Assignments, Test

15 Advanced topics, Putting it all together
Review - Final

16 Final Exam Period

II. Course Objectives*:

A. Use terminology associated with the computer science and the programming fields as they relate to engineering. III, VIII

B. Demonstrate use of Windows operating system, on-line resources and the PC microcomputer equipment. II, III, IX

C. Demonstrate a working knowledge of Engineering software and their applications. IV, V, VI, VII, IX, X, XII

D. Demonstrate proficiency in spreadsheets and their applications in engineering environments. V, VIII, XI

E. Demonstrate proficiency with a word processor. I, XI

F. Demonstrate a working knowledge of programming concepts. IV, V, VI, VII, IX, X, XII

G. Demonstrate proficiency in writing, testing and debugging engineering applied programming in the BASIC language. I, II, III, IV, V, VII, X, XI, XII

H. Demonstrate proficiency in using MATLAB software. IV, V, VI, VII, IX, X, XII

*Roman numerals after course objectives reference goals of the Business and Computer Technologies department.

III. Instructional Processes*:

Students will:

1. Recognize and use computer related terminology and its associated meaning. Technological Literacy Outcome, Information Literacy Outcome

2. Find resources and effectively use communication tools on the internet. Technological Literacy Outcome, Communication Outcome, Information Literacy Outcome, Transitional Strategy, Active Learning Strategy

3. Create documents using the features of a word processor. Technological Literacy Outcome, Communication Outcome

4. Create working desired output using the features of a spreadsheet. Technological Literacy Outcome, Communication Outcome

5. Use tools, utilities and features of various hardware and software products. Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Transitional Strategy
6. Create working programs producing desired results. Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy

7. Create graphical representations of engineering data. Communication Outcome, Technological Literacy Outcome

8. Meet deadlines while maintaining high quality results. Personal Development Outcome, Transitional Strategy

*Strategies and outcomes listed after instructional processes reference Pellissippi State’s goals for strengthening general education knowledge and skills, connecting coursework 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,F,G,H

2. Demonstrate an understanding of the use of hardware, firmware, and software technology. A,B,C,F,H

3. Demonstrate efficient use of the computer system and its operating environments. A,B,C

4. Demonstrate proficient use of internal and external DOS commands. A,C,E,F,G


6. Use word processing software to produce documentation and reports. E

7. Use a spreadsheet product and produce data output and graphs. A,B,D

8. Use an application spreadsheet in the engineering environment. A,B,D

9. Transfer data files to/from one storage device to another. A,B,C,E,G,H

10. Demonstrate proficient use of engineering software in problem solving, graphing, plotting and data manipulation. C,D,F,G,H

11. Learn the application of software packages to solve engineering problems. C,D,E,H

12. Apply logic to engineering situations and problems and resolve the task using a computer program. F,G,H

13. Enter programs and data to produce product outcomes and plots using MATLAB. A,B,C,F,H

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

V. Evaluation:

A. Testing Procedures:

There will be three tests, each 50 points, dates to be announced in class. There will be a midterm and final test, each worth 100 points. Homework and other lecture/lab/research assignments will total 50 points.
B. Laboratory Expectations:

There will be a number of labs from each section. 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 5 points per day. No assignment will be accepted more than one week late unless approved in advance by the lab instructor. Lab total points will be 300.

C. Field Work:

None

D. Other Evaluation Methods:

None

E. Grading Scale:

Grades will be assigned in accordance with the following scale:

- 630-700 points  A
- 560-629 points  B
- 490-559 points  C
- 420-489 points  D
- 0-419 points  F

VI. Policies:

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.