SOUTH SEATTLE COMMUNITY COLLEGE

Academic Programs

COURSE OUTLINE
Revision: Mike Steffancin, February 2008

DEPARTMENT: Academic Programs

CURRICULUM: Programming/Engineering

COURSE TITLE: Mat Lab Programming

COURSE NUMBER: ENGR 141

TYPE OF COURSE: Academic Transfer
Special Requirement Met: None

AREA(S) OF KNOWLEDGE: Science, Tech, Environment/Language of Science

COURSE LENGTH: 1 quarter

CREDIT HOURS: 5

LECTURE HOURS: 55

LAB HOURS: 0

CLASS SIZE: 25

PREREQUISITES: MATH& 142 or higher

COURSE DESCRIPTION:

This course will teach problem analysis, algorithm design, numerical techniques, and the elements of programming using MATLAB or a similar high-level programming language. The emphasis is on learning how to write clean, efficient, and well-documented programs for modeling of scientific and engineering problems.

STUDENT LEARNING OUTCOMES ADDRESSED:

1. Critical Thinking and Problem Solving—Students will use a five-step problem solving methodology commonly used in engineering practice throughout the course.

Homework and design projects specific to science and engineering will be used as well.

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STUDENT LEARNING OUTCOMES ADDRESSED: (cont.)

2. Computation—Students will use mathematical tools to model scientific and engineering problems using technical computing software.
3. Technology—Students will use state-of-the-art technical computing software for all of their assignments.
4. Information Literacy—Students will access the Internet for programming resources and information on current scientific and engineering problems and solutions.
5. Personal Responsibility—Students will be responsible for individual and group assignments.
6. Communication—Students will communicate the results of their work in electronic, written, and graphical form.
7. Human Relations—Students will work on complex programming projects together.

GENERAL COURSE OBJECTIVES:

At the end of the course the student will:

1. Be able to use algorithmic thinking in their approach to solving problems.
2. Be able to implement algorithms in MATLAB or another high-level language.
3. Have learned how to design and write clean, efficient, well-documented programs to solve scientific and engineering problems.
4. Be able to apply their knowledge of elementary science and mathematics.
5. Have a working knowledge of a variety of numerical techniques used in engineering analysis and some practical experience with their use.
6. Have the ability to formulate a problem, analyze it, and then communicate the results of their work in written and graphical form.
7. Have experience working in teams to solve complex problems.
8. Have basic knowledge of symbolic processing and graphical user interface construction.
9. Have a foundation on which to base their later applications of computers to science and engineering.

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TOPICAL OUTLINE:		APPROX. HOURS
I.	Introduction to computing	1
II.	Introduction to the computing environment	3
III.	Variables and arrays 3	
IV.	Data files, built-in functions	4
V.	Plotting, debugging	3
VI.	Top-down design techniques	1
VII.	Operators	1
VIII.	Branches	3
IX.	Advanced plotting	3
X.	Loops	3
XI.	User-defined functions	5
XII.	Complex data, character data	3
XIII.	Arrays and structures	2
XIV.	Input/Output functions	3
XV.	Handle Graphics	3
XVI.	Graphical user interfaces	3
XVII.	Special Applications	4
XVIII.	Assessment	3
XIX.	Design Project	4
	Total hours	55

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DATE: February 2008

ENGR 141
Course Prefix and Number: ENGR 141
Course Title: Scientific Programming

SLO #	Included in Course Objective Number	SSCC Student Learning Outcomes
SLO 1.1		Communication - Read and listen actively
SLO 1.2		Communication - Speak and write effectively
SLO 2.1	1-8	Computation - Use mathematical operations
SLO 2.2	1-6,8	Computation - Apply quantitative skills
SLO 2.3	3,4,5,8	Computation - Identify, interpret, and utilize higher level mathematical and cognitive skills
SLO 3.1	7	Human Relations - Use social interactive skills to work in groups effectively
SLO 3.2		Human Relations - Recognize the diversity of cultural influences and values
SLO 4.1	1-9	Critical Thinking and Problem Solving -
SLO 5.1	1-9	Technology - Select and use appropriate technological tools
SLO 6.1		Personal Responsibility - Be motivated and able to continue learning and adapt to change
SLO 6.2		Personal Responsibility - Value one's own skills, abilities, ideas and art
SLO 6.3		Personal Responsibility - Take pride in one's work
SLO 6.4		Personal Responsibility - Manage personal health and safety
SLO 6.5		Personal Responsibility - Be aware of civic and environmental issues
SLO 7.1	3,5	Information Literacy - Access and evaluate information
SLO 7.2	3,5	Information Literacy - Use information to achieve personal, academic, and career goals, as well as to participate in a democratic society

PREPARED BY: Mike Steffancin
DATE: May 2008