

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: INTRODUCTION TO PROGRAMMING

Code No.: CET106-4 Semester: 1

Program: COMPUTER ENGINEERING TECHNOLOGY

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Date: Aug., 1994 Previous Outline Dated: SEPT., 1993

APPROVED:

L. P. Cragg
Dean

94-08-24
Date

INTRODUCTION TO PROGRAMMING
COURSE NAME

CET106-4
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TOTAL CREDIT: 5

PREREQUISITES: None

I. PHILOSOPHY/GOALS:

This course is an introductory computer programming course which utilizes the Fortran programming language on the VAX computer to develop fundamental skills in programming concepts and utilization of the computer in problem solving. It is not intended to be a rigorous problem-solving course, but rather a course in which the student will learn the necessary skills to use the computer and the Fortran language effectively. These skills will be extended in successive courses such as CET129, Structured Program Development, in second semester.

II. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES):

Upon successful completion of this course the student will:

1. Use the VAX computer and the VMS operating system to create, compile, link and run Fortran programs.
2. Use VMS commands to manage files and directories on the VAX and use Mail, Phone, Help and other useful utilities.
3. Describe the fundamental structures of computer programs and how they are implemented in Fortran.
4. Develop algorithms to describe the solution of typical problems to be solved with the computer, and implement them with the Fortran language.

INTRODUCTION TO PROGRAMMING
COURSE NAME

CET106-4
CODE NO.

III. TOPICS TO BE COVERED:

APPROXIMATE TIME

- | | |
|--------------------------|---------|
| 1. Vax/VMS fundamentals. | 2 Weeks |
| 2. Vax utilities. | 4 Weeks |
| 3. Fortran fundamentals. | 3 Weeks |
| 4. Fortran programming. | 7 Weeks |

IV. LEARNING ACTIVITIES/REQUIRED RESOURCES

TOPIC 1 VAX FUNDAMENTALS

During this block the student will study the VAX computer and the VMS Operating System.

LEARNING ACTIVITIES:

At the end of this block the student will be able to:

1. Describe the organization of the Vax computer and the function of its parts.
2. Describe the typical software components of the system and their function.
3. Describe the Sault College computer network and the various ways of interacting with it.
4. Learn to use the network facilities and DCL (Digital Command Language) to:
 - a) Log on and off the system.
 - b) Delete, Purge, Rename, Copy, Print and display the contents of files.
 - c) Discuss the characteristics of editors, and use the features of the VMS EVE editor.
 - d) Describe the process of editing, compiling, linking and running a program. Discuss the differences between source, object, list and executable files.

REQUIRED RESOURCES:

TEXT: "VMS User's Guide" - Chapter 1, 2, 3, 4
Class Notes, Instructor's Notes

INTRODUCTION TO PROGRAMMING
COURSE NAME

CET106-4
CODE NO.

TOPIC 2 VAX UTILITIES

During this block the student will study and use various useful VAX utilities.

LEARNING ACTIVITIES:

At the end of this block the student will be able to:

1. Create and maintain directory structures and their associated files efficiently.
2. Develop and maintain a useful LOGIN.COM file.
3. Use the Help facility to clarify the operation of DCL commands.
4. Use the Mail and Phone utilities to communicate on-line and manage messages between users.

RESOURCES:

TEXT: "VMS User's Guide" Chapter 2, 5
Class Notes, Instructor's Notes

TOPIC 3 FORTRAN FUNDAMENTALS

During this block the student will learn to develop algorithms to describe the solution to problems. The student will learn the fundamentals of the Fortran programming language, and the techniques associated with applying it to solve problems.

LEARNING ACTIVITIES:

At the end of this block the student will be able to:

1. Describe the form of a Fortran program; in particular, the statements and the syntax associated with a simple Fortran source file.
2. Discuss and use of Fortran data types, including Integer, Real, Double Precision and Character and the conventions for naming entities.

INTRODUCTION TO PROGRAMMING
COURSE NAME

CET106-4
CODE NO.

3. Describe the three basic structures of structured programming: sequence, selection and repetition.
4. Describe various procedures for developing and describing algorithms for solving problems including flowcharts and pseudocode.
5. Describe and be able to apply the five step process for program development.
6. Describe the various ways of declaring data and initializing variables and constants.
7. Perform simple screen input and output.
8. Write arithmetic expressions to calculate values of variables, and use various numeric intrinsic functions available in Fortran.

RESOURCES:

TEXT: "VAX FORTRAN" by David Weinman Chapters 1, 2, 3
Class Notes, Instructor's Notes

TOPIC 4 FORTRAN PROGRAMMING

During this block the student will learn to apply the major statements available in Fortran to solve problems of greater complexity.

LEARNING ACTIVITIES:

At the end of this block the student will be able to describe and use the following Fortran instructions and techniques, including the writing, testing and debugging of programs using them:

1. Use looping mechanisms such as DO and DO WHILE to enable repetition in programs.
2. Use Relational and Logical operators and expressions in decision-making.
3. Perform input and output with terminal format files.

INTRODUCTION TO PROGRAMMING
COURSE NAME

CET106-4
CODE NO.

4. If statements and decision-making within programs.
5. Use Format statements to control the way that the output is displayed.
6. Perform character operations on strings.
7. Demonstrate appropriate programming style and documentation procedures.

RESOURCES:

TEXT: "VAX FORTRAN" by David Weinman Chapters 4, 5, 6, 7, 12
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INTRODUCTION TO PROGRAMMING
COURSE NAME

CET106-4
CODE NO.

V. METHOD OF EVALUATION:

3 THEORY TESTS (18% each)	54%
2 Quizzes (5% each)	10%
ASSIGNMENTS and LAB TESTS	30%
ATTENDANCE	6%

(The percentages shown above may vary where circumstances warrant.)

- Notes:
1. Lab work and assignments must be complete to the instructor's satisfaction for a passing grade to be achieved.
 2. A passing average on the theory tests is a requirement for passing this course.
 3. Before tests the instructor will provide details of the specific objectives to be tested.

GRADING SCHEME

A+	90	-	100%
A	80	-	89%
B	70	-	79%
C	55	-	69%
I	Incomplete		
R	Repeat		

UPGRADING OF INCOMPLETES

When a students course work is incomplete or final grade is below 55%, there is the possibility of upgrading to a pass when a student meets the following criteria:

1. The students attendance has been satisfactory.
2. An overall average of at least 40% has been achieved.
3. The student has not had a failing grade in all of the theory tests taken.
4. The student has made reasonable efforts to participate in class and complete assignments.

INTRODUCTION TO PROGRAMMING
COURSE NAME

CET106-4
CODE NO.

ATTENDANCE:

Absenteeism will affect a student's ability to succeed in this course. Attendance is encouraged because many things are discussed and learned in class that may not be specifically evaluated on tests. Absences due to medical or other unavoidable circumstances should be discussed with the instructor, so that remedial activities can be scheduled.

Up to 6% of the final grade will be based on attendance.

VI. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following.

VII. REQUIRED STUDENT RESOURCES:

TEXT BOOKS:

1. "VAX FORTRAN" by David Weinman (Nelson Canada)
2. "The VMS User's Guide" by Peters and Holmay (Digital Press)

INSTRUCTORS NOTES AND CLASS NOTES

VIII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY:

None required for this particular course.

INTRODUCTION TO PROGRAMMING
COURSE NAME

CET106-4
CODE NO.

IX. SPECIAL NOTES:

1. Students with special needs (eg. physical limitations, visual or hearing impairments, or learning disabilities) are encouraged to discuss any required accommodations confidentially with the instructor.
2. Your instructor reserves the right to modify the course as deemed necessary to meet the needs of students or take advantage of new or different learning opportunities.
3. The Blocks of objectives will not necessarily be covered in the order shown in this course outline.

X. COURSE ANALYSIS SHEET (see attached)

