

1. Department, Course Number, and Course Title:

**MATHEMATICS AND COMPUTER SCIENCE
CS 290 INTRODUCTION TO FORTRAN PROGRAMMING**

2. Designation: Required Elective
Lower Division Upper Division

3. Course Description: Elementary computer programming using FORTRAN language. Lecture 1 hour, laboratory 3 hours. No credit toward Computer Science major

4. Prerequisites: MATH 206, Calculus I, Differentiation

5. Text and Materials: FORTRAN 77 for Engineers and Scientists, 4th Ed., Nyhoff & Leestma, Prentice Hall, 1992.
Reference: FORTRAN 77 With Applications for Scientists and Engineers, 2nd Edition, Reddy & Ziegler, West., West Publishing Company, 1994

6. Course Objectives: Students should be able to: Have a good understanding of the basic programming concepts. Divide a problem into its logical set of components. Have a good understanding of how a good program design reduces coding and debugging time. Design and code mid-level problems. This course is offered as a service course for non CS majors. In this course, students will learn the basic concepts of Fortran programming language. They will learn algorithm development for structured programming, designing, coding, debugging, and documenting programs. Solutions design in this course mostly involves generating pseudo-code for program development.

Course Outcomes

- Understand basic programming concepts
- Divide a problem into its logical set of components
- Understand how good program design reduces coding and debugging time
- Design and code mid-level problems

7. Topics Covered: (in Order of Presentation)

- Introduction to Computer Systems, Programming, and Problem Solving
- Fortran Syntax
- Algorithm
- Control Structures
- Functions
- Arrays
- Files
- Program development using flowcharts. (Lab.)
- Modular program development. (Lab.)
- Programming using control statements. (Lab.)
- Repetitions; loops. (Lab.)
- Arrays, creating & using arrays. (Lab.)
- Sequential files, using data files. (Lab.)

8. Class Schedule: Number of Sessions per week: 1 lectures; 1 laboratory
Duration of each session: Lectures 1 hour
Laboratory 3 hours

9. Contribution of course to meeting the professional component:

This course is part of the one year (48 quarter units) of Basic Mathematics and Science.
Science 2 units

10. Relationship of course to program objectives:

This course relates to the program objectives by contributing to the following measurable outcomes at the level indicated for all engineering graduates:

Knowledge outcomes:

- an ability to apply knowledge of mathematics, science, and engineering (abet a)
- an understanding of professional and ethical responsibility (abet f)

Skill outcomes:

- an ability to analyze and interpret data (abet b)
- an ability to communicate effectively (abet g)
- an ability to think in a logical sequential process

Attitudes Outcome:

- a recognition of the need for an ability to engage in life long learning (abet i)
- a desire to be a flexible and adaptable team player

11. Prepared by:

Vladimir Akis
Updated by Maj Dean Mirmirani

12/1999
01/2006