COURSE OUTLINE

Computer Science/Information Systems 142 Scientific Computing

I. <u>Catalog Statement</u>

Computer Science/Information Systems 142 provides science and engineering students with a background in the standard computer tools used in research and development. The course covers basic Unix operating system practices, the fundamentals of Interactive Data Language (IDL) programming, and their application to the solution of typical scientific and engineering problems.

Units - 2.0 Lecture Hours - 2.0

Recommended Preparation: CABOT 208 or equivalent. Knowledge of a programming language is helpful.

II. <u>Course Entry Expectations</u>

Skills Level Ranges: Reading 5; Writing 5; Listening/Speaking 5; Math 3.

III. Course Exit Standards

Upon successful completion of the required coursework, the student will be able to:

- 1. use the Unix operating system for research productivity;
- 2. explain the Unix file system and networking tools with cross platform access;
- 3. demonstrate how to load and run programs and access data in a research environment;
- 4. use the IDL programming language and graphical user interface (GUI);
- 5. complete a task by using Unix and IDL in concert.

IV. <u>Course Content</u>

Total Contact Hours = 32

A.	Introduction	4 hours
	1. File system management	
	2. Editing and production tools	
	3. Cross network file access	
B.	Basic Unix Shell Programming	6 hours
	1. File manipulation and command pipes	
	2. Simple regular expressions	
	3. Integrating programs with the shell environment	
C.	Basic IDL Programming	12 hours
	1. Program organization	
	2. Variables and control mechanisms	
	3. Graphical user interface and tools for imaging and plotting	
	4. Data structures and operators	
D.	Integrating Unix and IDL to Manage a Research Task	10 hours

V. <u>Methods of Presentation</u>

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The following instructional methodologies may be used in the course:

- 1. lectures and demonstrations;
- 2. student projects;
- 3. use of systems and software in an online environment.

VI. Assignments and Methods of Evaluation

- 1. Oral and written assignments.
- 2. Practical tests.
- 3. Final examination.

VII. <u>Textbook</u>

Bowman, T. <u>Introduction to Programming With IDL</u> San Francisco: Morgan Kaufman, 2006 12th Grade Reading Level. ISBN 0-12-088559-X.

VIII. <u>Student Learning Objectives</u>

Upon successful completion, the student will be able to:

- 1. demonstrate an ability to use the Unix operating system for research productivity;
- 2. explain the Unix file system and networking tools with cross platform access;
- 3. demonstrate how to load and run programs and access data in a research environment;
- 4. use the IDL programming language and graphical user interface (GUI).