**SU DEPARTMENT OF COMPUTER SCIENCE SYLLABUS (Tentative)**
**COSC 118 Introductory Scientific Programming**

**Description:** A first course for students interested in using computer programming for scientific applications. Design, implementation and testing of Python programs will be the central focus of the course. (Three hours lecture and two hours lab per week.)

**Text:** "Starting Out With Python", by Tony Gaddis, Pearson, Addison Wesley, 4th Edition.

| Topics | Weeks |
|---|---|
| **An Introduction to Computers** | |
| An introduction to the basic programming concepts. | 1.0 |
| **Problem Solving** | |
| An introduction to the software life cycle, program design, and programming tools. | 1.0 |
| **Fundamentals of Programming** | |
| Control structures, event-driven programming, numerical calculations, string manipulation, Input and Output. | 1.0 |
| **Procedures** | |
| Functions, parameter passing and Modular Design. | 1.0 |
| **Branching** | |
| Logical operations, If blocks and case structures. | 1.0 |
| **Repetition** | |
| Loops and using repetition to process data. | 2.0 |
| **Arrays** | |
| The creation and use of both one-dimensional and two-dimensional arrays. | 2.0 |
| **File Processing** | |
| The creation and access sequentially and directly of large sets of data. | 1.0 |
| **Object Oriented Programming** | |
| Introduction to classes and instances | 1.0 |
| **NumPy, MatPlotLib, and Modules** | |
| Introduction to Modern Scientific Python Modules | |
| **Exams/Projects** | <u>3.0</u> |
| | 14.0 |

EVALUATION

| | |
|---|---|
| Programs/Designs | 10-30% |
| Projects | 10-30% |
| Exams | 25-50% |
| Final Exam | 10-30% |

Writing Across the Curriculum: Written lab reports, program designs, documentation and written assignments will be evaluated.