

SU DEPARTMENT OF MATHEMATICS & 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.