

## Physics 300 Computational Science and Physics

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Professor: Stephen Lepp  
Time: TTH 10:00 - 11:15  
Office Hours: T 11:15 - 12:30  
Text: Python Tools for Scientists

### Course Objectives:

To give the students a basic introduction to scientific programming.

### Learning Outcomes:

Students will be able to write programs to solve simple physics programs on the computer.

Students will be able to design programs to avoid common numeric pitfalls when solving simple physics programs on the computer.

Students will be able to execute programs and report on their results.

Students will be able to read and debug simple programs.

Students will have a working knowledge of how numbers are stored on a computer and how this influences their numerical solutions.

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### Projects:

Number	Title	Methods
0	Series	Simple Programs
1	Integration	Simple Programs
2	Orbit calculations	Integration
3	Orbit calculations	Differential Equations
4	Bose-Einstein Statistics	Root Finding
5	Fractal Dimension	Complex Numbers
6	Computer Generated Holograms	Fourier Transform
7	Random Dot Stereograms	Matrix

### Grading:

Problems and Quizzes	25
Projects	50
Final	25

Best guess – Final Exam on Tuesday Dec 10 at 10:10-12:10