



國立清華大學
NATIONAL TSING HUA UNIVERSITY

11120PHYS290000

Introduction of Computational Physics
計算物理概論

Syllabus

Instructor

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Teaching assistant (TA)

TBA

Class schedule

Lectures on Monday M7M8M9
Physics building, R313

Preface

This course is designed for the **first computational course** for our physics students. All physics students without prior programming experience are highly encouraged to take this course. All advanced computational or numerical courses offered by the Physics department or Institute of Astronomy would rely on the material we covered in this course.

In this course, we will learn basic programming using Python. In particular, we will learn how to use numpy, scipy, numba, and matplotlib. In addition to programming, basic concept of shell environment and version control with git will be covered as well.

A Unix-like system (e.g. Linux, Mac OS X, or Windows 10 subsystem for Linux 2) is required. Students are **required** to bring a laptop to class.

Mini-exams

There will be no midterm or final exams, but there will be a few mini-exams during the lectures to test if you understand the concept or not.

Evaluation

Grades will be determined by homework assignments (70%), in-class mini-exams (20%) and attendance (10%). Extra bonus points from class participation will be added.



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Tentative topics

Topics

1. Programming with Python (from beginner to a junior computational physicist)
2. Object-oriented programming with Python
3. Precisions and floating point numbers
4. Command line interface and shells
5. Visual Studio Code and Jupyter notebook
6. Version control with git
7. numpy and scipy for scientific computing
8. Data frame and statistic
9. Data visualization with matplotlib
10. Speedup your codes