Computers in Physics Exps.
Spring Quarter 2021
Physics 116C

Michael Mulhearn
mulhearn@physics.ucdavis.edu
Physics 317

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| **Lectures:** | W 1:10-2:00 PM | | Remote Instruction |
| **Labs:** | Section 1: | M 3:10-6:00 PM | Remote Instruction |
| | Section 2: | W 4:10-7:00 PM | Remote Instruction |
| **References:** | `https://www.scipy-lectures.org` | | |
| | Online lecture notes on data analysis and fourier analysis. | | |
| **Lab Instructor:** | TBD | | |
| **Final Exam:** | No Final Exam | | |

**Course Description:** Modern experiments rely heavily on microprocessors to acquire and analyze experimental data. We will use Scientific Python for analysis of experimental data. Topics include statistical distributions, experimental uncertainties, statistical analysis, and Fourier analysis. We will also study computer architecture and assembly language.

**Lectures:** Lectures will be asynchronous with recorded optional synchronous recaps and problem-solving sessions.
The optional synchronous lectures will be offered during the Wednesday lecture slot over zoom. The lectures will be recorded, but will include a short unrecorded session for additional questions at the end. The recorded lectures will be posted on the course website.
The remaining lecture material will consist of pre-recorded videos which can be viewed whenever it is convenient. My experience has been that pre-recorded videos cover material much faster than traditional lectures, so generally there will be less than two hours of pre-recorded content per week.

**Labs:** The lab activities will be asynchronous, but the lab TAs will be available over zoom to provide help. Students may attend any lab section they choose, it does not matter which section you are formally assigned to. We may have to revisit this if attendance becomes too lopsided, but it has worked fine in previous courses.
The due date for each lab will be included with the assignment. There is also an automatic one week grace period. If you are having difficulty keeping up beyond the grace period,

contact the instructor to devise a schedule. I am extremely accommodating during remote learning, but I do not want to encourage procrastination which could lead to an extremely hectic end of the quarter.

**Office Hours:** The Monday lecture time slot will be repurposed for office hours. Office hours will not be recorded. Use the lecture zoom link from the course web site.

**Homework:** There will be five homework assignments, three on statistics, one on Fourier analysis, and one on assembly. Using online solution services is not permitted. To minimize the effectiveness of online solution services, homeworks will be graded based on effort only.

**Exams:** There will not be a final exam. There will be a midterm exam, with format to be determined.

**Course Outline**:

| **Week** | **Wed Lecture** | **Lecture** | **Lab** |
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| 1 | 31 Mar | (No Lecture) | Scipy and Plotting |
| 2 | 7 Apr | Recap S1 | The Monte Carlo Method |
| 3 | 14 Apr | Recap S2 | Limits of Distributions |
| 4 | 21 Apr | Problems | Uncertainties |
| 5 | 28 Apr | Recap S3 | Ideal Gas |
| 6 | 5 May | Problems | Curve Fitting |
| 7 | 12 May | Recap F1 | TBD |
| 8 | 19 May | Problems | TBD |
| 9 | 26 May | Problems | TBD |
| 10 | 2 Jun | Problems | No Lab |