

Week 8 - 10

Final Project and Presentation

Physics 4AL

Spring 2020

University of California, Los Angeles
Department of Physics and Astronomy

Learning Outcomes

- Learn how to design and conduct your own experiment as a group.
 - Collaborate closely (but remotely)
 - Follow curiously, and complete the project in 3 weeks.
- Learn how to apply your working knowledge:
 - Arduino-based data taking
 - Analyzing motion based videos using Tracker
 - Data analysis by Python
 - Related physics topics from Physics 1A/1B/1C
- Learn how to make oral presentation.
 - Preparation of clean google slides
 - Presentation by pre-recording (by Zoom)

Possible 4AL Projects

- **Projectile motion based projects**
 - **Conservation of momentum/energy**
 - **Biomechanics / Human body motion projects**
 - **Oscillation based projects**
 - **Friction**
 - **Rotation based projects**
 - **Neuroscience based projects**
 - **Reaction Time**
 - **Working Memory**
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Weekly Operation

- All of students are supposed to work together
 - at the assigned section times
 - present status report to TA at each section (10 - 15 minutes /group)
 - plus extra convenient times (together or individually)
- Each team is supposed to distribute tasks so that
 - Some members setup the experiments at home and collect data.
 - All members analyze the data individually.
 - All members contribute to presentation slides and report.
- But welcome to have well-defined separate tasks per member
 - Hardware specialist
 - Analysis specialist

Weekly Schedule: Week 8 - 10

- **Week 8 (May 18- 24)**
 - Design and setup experiments
 - Preliminary data taking and analysis
 - **Week 9 (May 25 - 31)**
 - Final data taking and analysis
 - Google Slides
 - **Week 10 (June 1 - 4)**
 - Video Recording
 - Presentation
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Week 8 (May 18 - 24)

- **Mon/Tue (May 18/19)**
 - **Conceptual design**
 - **Setup and debugging**
 - **Wed/Thu (May 20/21)**
 - **Preliminary data taking**
 - **Fri - Sun (May 21 - 24)**
 - **Preliminary data analysis**
 - **Upload draft Google Slides (Outline)**
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Week 9 (May 25 - 31)

- **Mon/Tue (May 25/26) -- *Monday is Memorial Day***
 - Fine-tuning the data taking system
 - Taking more data
 - **Wed/Thu (May 27/28)**
 - Final data taking and analysis
 - **Fri - Sun (May 29 - 31)**
 - Complete data analysis
 - Upload the final Google Slides
 - Recording practice
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Week 10 (June 1 - 4)

- **Mon/Tue (June 1/2)**
 - **Final recording by Zoom**
 - **Upload the Video Clip**
- **Wed/Thu (June 3/4)**
 - **Oral Presentation (by video)**
- **Sunday, June 14**
 - **Final Group Report to GradeScope**

Google Slides (~10 pages)

1. Title, Authors (with majors, pictures)
2. Introduction: Motivation, Hypothesis
3. Methods
 - a. Experimental setup (with a picture)
 - b. Data taking protocols
 - c. Data Analysis
4. Discussion and Conclusions
 - a. Evaluation of significance
 - b. Conclusions
 - c. Future prospects
5. Acknowledgements
6. References

Pre-recording presentation (7-10 minutes)

- **7- 10 minutes of Pre-recording**
 - **Zoom recording.**
 - **Include speakers' video at the top-right corner.**
 - **Suggestions**
 - **Look at the direction of the camera.**
 - **Speak slowly and clearly.**
 - **Do not read written sentences.**
 - **Speak naturally.**
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