

Applications of Nanoscience Syllabus

Description: Welcome to Applications of Nanoscience! This course is designed for high school students who are interested in learning the essential skills of research scientists and how those skills translate to nanotechnology in the outside world. During this intensive two-week program, you will develop skills in scientific literacy and scientific communication, explore important and current applications of nanoscience through hands-on experiments, and propose a nanoscience-based product with a related preliminary research project in pursuit of new scientific data. As you develop your proposal, you will get the chance to explore many different scientific techniques and several types of instrumentation that the university has to offer.

Education Manager:

Rita Blaik, PhD

Program Coordinator:

Elaine Morita, PhD

Instructors:

Graduate students TBD

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Course Hours: MTWRF 9:00 AM – 5:00 PM in the California NanoSystems Institute Lobby. Laboratories will be held in Young Hall 1343. A course schedule is attached. Even though course hours are only 9:00 AM – 5:00 PM, you are expected to follow attendance codes of conduct for Summer Sessions and this course for the duration of the two-week program unless prior written permission is obtained at least three days before the beginning of the course. You should also expect to spend about 1-2 hours per night on homework during week 1, and about 2 hours per night on preparing for your final projects during week 2.

Overall Course Structure:

Week 1 is focused on giving you the skills you need to be a successful scientist. In the mornings, we will talk about technology entrepreneurship and skills that scientists need outside the lab, and give you a chance to practice them. The afternoons will include laboratory experiments.

Week 2 will be your chance to take what you learned in Week 1 and apply these skills to develop your own ideas. On Tuesday, you will give a preliminary product pitch and associated research (you'll receive guidelines for this later) and receive feedback from your

peers and instructors. You'll spend the rest of the week carrying out your preliminary experiment and developing business plans, and then give a final presentation on Friday. We will assign your groups for Week 2 based on similar research interests.

Safety Dress Code: Lab safety is very important. You must wear long pants and shoes that cover the entire foot. A lab coat, safety glasses, and gloves will be provided when necessary. If you arrive in inappropriate clothing, you will be sent to purchase some at the UCLA store. **If you are not dressed appropriately, you will not be allowed to participate in the day's experiments.**

Pre-Homework: You are responsible for a set of vocabulary terms that will be sent out before the course begins. We look forward to everyone bringing their own strengths from their own unique background, but we also want to make sure that everyone is familiar with some basics by the time we begin. These terms come from biology, chemistry, and physics, and you should bring your definitions with you to class and be prepared to define any one of them for the class. Everyone will be called on at least once, so make sure you have them all written down!

Homework: There will be four homework assignments given during the first week; each one will expand on the skills we go over in the morning workshops. These assignments are due at 9:00 AM the day after they are assigned. They will be graded for effort on a scale of unsatisfactory (\checkmark -), satisfactory (\checkmark), or excels (\checkmark +).

Quizzes: There will be pop quizzes assigned randomly throughout Week 1 based on the experiments performed each afternoon. Pay attention to the instructor leading each experiment to know what might be included in the content.

Final Presentation: At the end of our two-week course, you will present your research proposal and preliminary data. We invite your families to attend, with questions! This presentation session will be held on Friday (7/22/22) from 9:30 AM – 12:00 PM in the CNSI Auditorium. We'll give you more information about this as it gets closer.

Grading: Pass/no pass.

The grading structure is as follows:

- Completion of homework assignments with an average grade of satisfactory (20% of total grade)
- Quizzes (20%)
- Participation in all workshop activities and lab activities (15%)
- Preliminary presentation (10%)
- Final presentation (35%)

A passing grade requires a total score of at least 70%. In addition, any student who fails to abide by the proper codes of conduct as defined in the welcome packet and our safety rules may receive a “no pass” grade. If you ever feel like you’re struggling, please feel free to come talk to any of the instructors!