

SIO 179 – Ocean Instruments and Sensors

Spring qtr. 2022

Instructor: Todd Martz, MESOM 337, x47466, trmartz@ucsd.edu
Location: Scripps Makerspace
Time: Tue/Thurs, 9-10 (Lecture); Tue/Thurs 10am – 1pm (Lab)
TA: Taylor Wirth (twirth@ucsd.edu)

Theme

Apply modern and classic techniques for analysis of seawater, introducing concepts of signal transduction, calibration, and measurement quality control. Emphasis will be placed on computer automation to perform basic functions including instrument control, data storage, and on-the-fly calculations. Students will apply techniques from several branches of engineering to the marine sciences.

Requirements

This is a hands-on laboratory course. Students will complete a single term or several multi-week projects, working in groups of 2-3, and prepare one PowerPoint report per group per exercise. Class meets once per week for up to 2 hours to cover theoretical overview and open discussion of the experiment or data analysis. Homework will be in the form of laboratory preparation and completion of reports.

Laboratory time will be scheduled by the instructor based on availability of equipment and individual teams' schedules and is expected to require ~6-8 hours per week. Grades will be based on participation in lab, quality of the reports. Grading considerations will include comprehension of the material, presentation of data (i.e. quality of graphs, figures, and tables), data interpretation, report organization & overall clarity. All lab reports undergo a single revision cycle and the grade is based on the revised report.

Prerequisite Knowledge

No prerequisite courses are required, but the advanced nature of projects is intended for those with some background knowledge in at least one area of engineering, physics, or chemistry. Advanced concepts related to marine chemistry and engineering will be introduced and reviewed as needed.

Course Materials

- Computers and a variety of development tools will be available in the makerspace.
- A variety of research quality instruments and sensors will be available through the instructor's laboratory.
- Any additional materials will be discussed during the first class period.