COMPETENCIES ARE THE SKILLS, KNOWLEDGE AND ATTRIBUTES GAINED THROUGH EVERY WORK, EDUCATIONAL, VOLUNTEER AND LIFE EXPERIENCE.

UVic students in the Earth and Ocean Sciences program develop the following program-specific competencies. We worked with the Department of Earth and Ocean Sciences to develop this document.

EARTH AND OCEAN SCIENCES

Understands the underpinning earth science theory that supports professional scientific practice and applies this to own area of interest

- Understands the origin and structure of the oceans and atmosphere and the dynamic processes that drive ocean and atmosphere circulation, weather patterns and global climate change
- Examines the internal and external processes that shape the earth and its landscapes, nature of tectonic forces, earthquakes, volcanoes, rocks and minerals and mountain building
- Understands the physical, chemical and biological nature of sediments at sea and on the land
- Explores geometric, kinematic and dynamic analysis of deformation structures in rock bodies
- Applies an understanding of the fundamental principles and concepts of mineralogy and optical mineralogy
- Studies natural hazards including earthquakes, volcanoes, tsunami, landslides, flooding, extreme weather, and meteor impacts
- Explores the scientific basis of current topics and issues affecting the world's oceans
- Applies understanding of earth science to explore and develop own interests in areas such as Geoscience, Geophysics, Ocean-Atmosphere, Geochemistry, Life on Earth or Ocean Science

SCIENTIFIC METHOD

Understands and uses the principles of the scientific method

- Gathers empirical and measurable evidence through observation and experimentation
- Analyzes data, defines research problem and predicts the outcome
- Uses inductive reasoning and deductive methods to formulate testable, falsifiable hypothesis
- Designs an approach/experiment to test and evaluate hypothesis
- Observes and records the results of the research
- Analyzes results using chemistry knowledge and mathematical techniques
- Draws conclusions
- Communicates the results and/or conducts further research

COMPUTATION

Develops and uses scientific software to support research endeavors

- Creates and modifies scientific software
- Utilizes discipline specific software effectively
- Develops and uses computation modeling as a proxy for physical experimentation
- Develops and uses computational methods to analyze large data sets
FIELD WORK

Conducts research in the field

✦ Observes behavior/properties of subjects/phenomena of interest in situ
✦ Makes measurements of the subjects/phenomena or their environment
✦ Identifies and collects samples for analysis
✦ Operates and uses equipment/tools/machinery appropriately

LABORATORY WORK

Utilizes practical and safe techniques within a laboratory setting

✦ Takes precise and accurate measurements
✦ Follows methods and techniques relevant to chemistry
✦ Develops and optimizes methods and techniques relevant to chemistry
✦ Analyzes, synthesizes, purifies, modifies and/or characterizes compounds, samples, or devices
✦ Uses instrumentation appropriately
✦ Calibrates instrumentation
✦ Maintains instrumentation
✦ Troubleshoots instrumentation
✦ Troubleshoots procedures
✦ Utilizes safe and careful practices at all times

EDUCATION AND TRAINING

Instruct co-workers in scientific procedure

✦ Teaches scientific concepts and knowledge at a level appropriate to the audience
✦ Assesses achievement of learning outcomes
✦ Trains and supervises others to perform scientific/laboratory procedures