

## HUMBOLDT STATE UNIVERSITY

Your Secondary Education (SED) application will be assessed by a committee of professors in your chosen subject area. They will conduct subject matter competency assessment (SMCA), which may include an interview, presentation, and/or writing sample (depending upon your specific subject area). The SMCA committee will rank and select applicants for a SED departmental interview. **Only those applicants who pass subject matter competency assessment will be considered for admission.** The SED coordinator will notify applicants of the SMCA results and schedule SED program interviews.

Department: CHEMISTRY & PHYSICS  
Subject Matter Competency Assessment

Contact Secondary Education Coordinator Sheila Rocker Heppe for more information at 707.826.5870 or e-mail [srh@humboldt.edu](mailto:srh@humboldt.edu).

All persons applying for admission into the Teacher Preparation Program must be assessed for competency in their chosen content areas. For the Chemistry and Physics Program, applicants usually have a strong background in Chemistry, Physics or Physical Sciences; competency must be demonstrated as described below.

### Measure 1: Assessment of Chemistry, Physics or Physical Science background

- Applicants must have completed a Bachelor's Degree (B. S. or B. A.) in Physics, Chemistry or Physical Sciences.
- Applicants with a related science degree with sufficient concentration of courses or minor in Chemistry, Physics and/or Physical Sciences may also be considered by the committee. Applicants with such degrees must have at least 2 semesters (or equivalent) of general Chemistry with a laboratory and either 3 semesters (or equivalent) of calculus-based physics or 2 semesters (or equivalent) of algebra- and trigonometry-based physics
- For Chemistry, pass the CSET, Chemistry: Subtest I: General Science; Subtest II: General Science \*\*; Subtest III: Chemistry. (See CSET Bulletin for breakdown of General Science subtests.)
- For Physics, pass the CSET, Physics: Subtest I: General Science; Subtest II: General Science\*\*; Subtest III: Physics. (See CSET Bulletin for breakdown of General Science subtests.)

**All required exams must be passed before beginning the SED program in August.**

### Measure 2: Oral Interview and Examination

After evaluation of Measure 1, candidates may be invited for an interview with 2 or 3 faculty members in Chemistry, Physics or other College of Natural Resources and Sciences faculty. Interviews will be conducted in mid spring. In addition to questions from the general areas of physics, chemistry and physical sciences appropriate to the level of instruction which you will be expected to teach in high school, the committee will ask the student to make a presentation as described below.

Choose ONE topic from the list below and present a lesson appropriate for a high school chemistry or physics class. Include an outline of the presentation for the committee and indicate any associated classroom or laboratory activities that would accompany or complement the lecture. It is not necessary to carry out the activity or laboratory; a description of activities or examples of appropriate activities will be sufficient. You will not be expected to give a polished presentation; we are looking to assess your potential as a high school teacher. Use of visual aids is strongly encouraged. The presentation should take about 20 minutes and you should be prepared to answer questions on the content of your presentation. Please inform us of any presentation equipment needs you will need to make your presentation. We recommend that you look at the appropriate sections of the California Science Framework of the California State Department of Education. The Chemistry & Physics Assessment Committee uses this reference as the basis for choosing presentation topics.

Chemistry:

- Explain the concept of a limiting reactant in chemical reactions. Illustrate by setting up and solving an example problem.
- Explain exothermic and endothermic reactions.
- Explain atomic absorption and emission of light.

Physics:

1. Explain the basic properties of a resistor, a capacitor and an inductor. Be prepared to discuss both the physics of these devices and the how they operate in a circuit. Explain qualitatively the effect of placing these 3 elements in series in a circuit.
2. Explain how a diffraction grating works. Cover both single slit diffraction and double slit diffraction in your explanation.
3. Explain the collision of two objects for which external forces may be ignored such as gliders on an air-track or pucks on an air table. Your explanation should cover both elastic and inelastic collisions.
4. Explain Newton's laws of motion. Clearly explain the concepts of force, mass and acceleration. Analyze to a simple physical system using these concepts.