

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: BIOLOGY
Subject Matter Competency Assessment

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All persons applying for admission into the Secondary Teaching Credential Program must be assessed for competency in their chosen content areas. The Department of Biological Sciences follows the assessment process described below.

MEASURE 1: ASSESSMENT OF LIFE SCIENCE BACKGROUND

OPTION A) CCTC-Approved WAIVER

To aid the Life Sciences Assessment Committee in evaluating your formal background in the natural sciences, the committee needs information about your academic background. To assist us with this task, we have included a form for you to use to document your formal background in the sciences and mathematics. Please use your university transcripts to complete the appropriate form and include it as part of your application for admission to HSU's Single Subjects Teaching Program. Your organized academic record and letters of recommendation from faculty will serve as the main source of information upon which offers for oral interviews will be based.

Note, you must possess the minimum overall grade point average of 2.7 or higher, and no grades lower than a straight C are accepted in the required courses for the waiver program (no C minus, D plus, D, or F). For a list of these courses see the Humboldt State University Baccalaureate Major Requirement Form; MAJOR: Biology; CONCENTRATION: Biology Education.

OPTION B) CCTC-Approved EXAM

Pass the CSET exams: Subtest I: General Science; Subtest II: General Science; Subtest III: Biology/Life Science. You must also show evidence of having completed approximately the same amount of laboratory semester hours in natural science as a graduate from HSU with a major in biology and option in secondary science teaching (all HSU science courses in the waiver program, except Evolution (BIO 445) contain both laboratory and lecture components). See enclosed form titled, Humboldt State University Baccalaureate Major Requirements Form, for list of specific courses that contain laboratories.

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

MEASURE 2: ORAL EXAMINATION

After satisfying Measure 1, candidates may be invited for an oral examination and interview with the Department of Biological Sciences. **Oral exams will be conducted on the first Friday in March.** The California Single Subject Credential in Biology certifies the holder to teach general science classes, integrated science classes, and any level of high school biology. Holders of this credential will most likely be teaching ALL areas of science (geology, biology, chemistry, and physics), at least at the introductory level (up to 9th grade level), plus teaching college prep biology, and possibly advanced placement biology. The Life Science Assessment Committee is therefore charged with certifying applicants' competence in these areas before a candidate may be admitted to the teaching credential program with an emphasis in biology. This is the reason for the oral examination.

The examination committee will most likely consist of three biology professors and two high school science teachers and/or university supervisors of science student teachers. There are six major areas of biological science: cellular & molecular biology, heredity (genetics), physiology, ecology, taxonomy (diversity of life), evolution. Applicants will be assessed on two to three of these specific areas of biology (selected randomly one week prior to the examination) via questions asked by the examination committee. We will inform you of the specific areas one week prior to the examination, but this does not mean that the other areas will not be covered during follow-up questioning. In addition, applicants will be asked one question of a general/integrated science nature.

We recommend that applicants look carefully at the *California Science Framework*, produced by the California State Department of education (1990), and the *National Science Education Standards*, produced by the National Research Academy (1996). The Life Science Assessment Committee will use these references as a basis from which to generate oral examination questions. The chapters

on biology content are especially pertinent. Standard college-level introductory biology, chemistry, and physical science textbooks should also make useful references from which to study for the oral examination. If you have any questions, feel free to contact me.

Respectfully yours,

Jeffrey White, Chair
Life Sciences Assessment Committee
(707) 826-5551

Sample Oral Examination Questions

These questions are provided to give applicants an idea of the kinds of questions that they might be asked during the oral examination. These are only examples. Actual exam questions may vary significantly from the format shown below.

Cellular & Molecular Biology questions

- You are presented with a selection of cells: bacterial, plant, and animal.
- Choose one or more of these cells and describe how substances may be transported into and out of the cell. One of the substances must be some kind of protein.
- Discuss the role of the nucleoid or nucleus.
- Pick at least two macromolecules and discuss their general chemistry, how they are synthesized by organisms, and their major roles in cell structure and function.

Heredity questions

- You may be asked to solve basic monohybrid and dihybrid cross genetics problems.
- Analyze pedigree charts to determine the mode of inheritance or genotypes of individuals.
- Determine the blood type of a mother given her baby's blood type and the blood type of the father.

Physiology

- Pick either a plant or animal system and describe how the organism fuels itself. I.e., how does it satisfy its ATP needs?
- Pick either a plant or animal system and describe how the organism grows.
- Pick either a plant or animal system and describe how the organism transports materials throughout its entire body.

Ecology

- Pick an ecosystem and discuss how energy and nutrients flow and cycle through the system. Include a discussion of at least one major biogeochemical cycle, such as carbon, nitrogen, phosphorus, or sulfur.
- Describe a population of organisms that actually exists or could exist on Earth, then discuss how it changes over time under changing environmental conditions.

Taxonomy (diversity of life)

- Select a group of organisms from the lists provided by the committee. Discuss how the different organisms are similar and different from one another. Discuss some ways used by scientists for placing organisms into different groups.
- Discuss the concept of species.

Evolution

- Discuss some of the evidence for evolutionary change on Earth.
- Discuss how a new species might arise on Earth.

Integrated Science

- Give a basic definition of acids and bases. Discuss how acid rain forms, how it can be produced in one area, then return to the earth as rain in another area. Discuss how acid rain affects abiotic and biotic components of the environment.
- Solid waste is a major problem in this country. Discuss several ways in which solid waste impacts our society. Address this issue from at least two different arenas of science: geology, biology, chemistry, and physics. Discuss several ways in which solid waste may be reduced.

If you are a Humboldt State University Graduate or if you completed the majority of your coursework at HSU, then please use this form to list your semester hours and grades earned for the required coursework in the Biology Major, Science Education (Biology) concentration. List substitutions for HSU's required courses and additional science coursework in the spaces provided on the reverse side of this form.

****Please include this form in your application packet to the Secondary Credential Program****

**HUMBOLDT STATE UNIVERSITY
BACCALAUREATE MAJOR REQUIREMENTS FORM**

NAME _____ SSN _____ CATALOG YEAR _____

Passing credit will be or has been presented in the courses listed below to satisfy all major requirements. Included are all courses completed, courses in progress, incomplete courses to be made up, and all courses to be taken either at Humboldt State University or at other accredited institutions to apply to this major.

Student's Signature _____ Date _____

MAJOR BIOLOGY

CONCENTRATION BIOLOGY EDUCATION

Institution	Dept.	Course Number	Title	Sem. Units	Grade
HSU	BIOL	105*	Principles of Biology	4	
HSU	BOT	105*	General Botany	4	
HSU	ZOOL	210*	General Zoology	4	
HSU	CHEM	109*	General Chemistry	5	
HSU	PHYX	106*	College Physics	4	
HSU	PHYX	107*	College Physics	4	
HSU	GEOL	109*	General Geology	3	
HSU	MATH	105	Calculus for Bio Sci and NR	3	
HSU	BIOM	122	Introductory Biometrics	4	
HSU	BOT	310*	General Plant Physiology OR	4	
HSU	ZOOL	310*	Vertebrate Physiology	4	
HSU	BIOL	330*	Principles of Ecology	3	
HSU	BIOL	340	Genetics	4	
HSU	BIOL	412*	General Bacteriology	4	
HSU	BIOL	440*	Genetics Laboratory	2	
HSU	BIOL	445	Evolution	3	
HSU	CHEM	328*	Brief Organic Chemistry	4	
HSU	GEOL	375*	Planet Earth	3	
HSU	BOT	350*	Plant Taxonomy OR	4	
HSU	ZOOL	352*	Natural History of Vertebrates	4	

*Indicates courses that have laboratory component.

**To be admitted to HSU's Teaching Credential Program in Biology, you must have an overall GPA of 2.72 (set by the State, subject to change), and no grades lower than a straight C are allowed in the courses listed on this sheet. You must complete SED 210/410 & EDUC 285 prior to admission to the program.

