

# College of Science

## Overview

We offer a comprehensive array of courses, programs, and undergraduate degrees encompassing the biological sciences, earth sciences, physical sciences, and mathematics. Additionally, we provide research and educational work experience through projects available in the College's departments or centers.

## College Mission and Goals

### Mission

The College of Science offers a comprehensive array of courses, programs, and undergraduate degrees encompassing the biological sciences, earth sciences, physical sciences, and mathematics. Courses are offered through three life science departments: Botany, Microbiology, and Zoology; three physical sciences departments: Chemistry, Geosciences, and Physics; and the department of mathematics. Programs are available in four undergraduate curricular offering categories: Professional, Science Education, Mathematics Education, and general education.

### Goals

- Attract, hire, and retain high-caliber faculty
- Support and reward faculty activity and achievement
- Attract, retain, and graduate high quality students
- Improve instruction through better lab equipment and appropriate new technologies
- Support and encourage student research
- Gain better financial support
- Obtain space and the facilities which are needed to accomplish our goals
- Improve faculty and staff salaries
- Develop and enhance community relationships and partnerships
- Improve the quality and effectiveness of recruiting, advising, and placing of students

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## University Program/ Accreditation Review

The following table indicates the schedule of University Program/ Accreditation Review for each program:

**Standard 2: Table II. College of Science University Program/Accreditation Review.**

Department/Program	University Program/Accreditation Review	
	Last	Next
Botany	2002-03	2007-08
Chemistry	2002-03	2007-08
Geosciences	2002-03	2007-08
Mathematics	2002-03	2007-08
Microbiology	2002-03	2007-08
Physics	2002-03	2007-08
Zoology	2002-03	2007-08

## Student Statistics

The following table shows enrollment and degrees for 2002-03:

**Standard 2: Table LII. College of Science Student Statistics.**

	Fall 2002	2002-03	2002-03 Degrees		
	Enrollment	Annual FTE*	Associate	Bachelor	Master
Botany	877	182	0	0	0
Chemistry	2,341	478	3	11	0
Geosciences	707	149	0	20	0
Mathematics	4,626	1,249	0	10	0
Microbiology	1,169	226	0	26	0
Physics	1,242	251	0	7	0
Zoology	1,487	358	0	45	0
<b>Total</b>	<b>10,611</b>	<b>2,893</b>	<b>3</b>	<b>119</b>	<b>0</b>

## Faculty/Staff Statistics

The following table shows the number of full- and part-time faculty and staff:

**Standard 2: Table LIII. College of Science Faculty/Staff.**

Department/Programs	Full-Time Faculty	Part-Time Faculty	Full-Time Staff	Part-Time Staff
Botany	6	2	1	1
Chemistry	12	2	3	
Geosciences	5	4		1
Mathematics	22	37	2	
Microbiology	6	7	2	
Physics	10	4	2	
Zoology	11	4	2	
Center for Science and Mathematics Education			1	
Chemical Technology Center				
Museum of Natural Science				1
Ott Planetarium				5
<b>Totals</b>	<b>72</b>	<b>60</b>	<b>12</b>	<b>8</b>

- Place greater emphasis on the use of scientific knowledge to make the world a better place
- Assess programs, improve curriculum, and track graduates
- Assist with the national effort to significantly improve the quality of science and mathematics education which is taking place in the public and private schools, K-12

## Faculty Evaluation

The following table shows frequency, source of evidence and decision review of faculty by program. See Standard 4 for more specific information on faculty evaluation.

**Standard 2: Table LIV. College of Science Faculty Review by Department.**

Faculty Status	How Often	Source of Evidence				Decision		
		Dean/Chair	Peer	Student	Self	Improvement/Development	Retain/Release	Promotion/Tenure
<b>Tenure</b>								
Botany	Annual	X	X	X	X	X		X
Chemistry	Annual	X	X	X	X	X		X
Geosciences	Annual	X	X	X	X	X		X
Mathematics	Annual	X	X	X	X	X		X
Microbiology	Annual	X	X	X	X	X		X
Physics	Annual	X	X	X	X	X		X
Zoology	Annual	X	X	X	X	X		X
<b>Term</b>								
Botany	End of Term							
Chemistry	End of Term							
Geosciences	End of Term							
Mathematics	End of Term	X		X	X	X	X	
Microbiology	End of Term	X		X	X	X	X	
Physics	End of Term							
Zoology	End of Term							
<b>Part-Time</b>								
Botany	Annual	X		X		X	X	
Chemistry	Annual	X		X		X	X	
Geosciences	Annual	X		X		X	X	
Mathematics	Annual	X		X		X	X	
Microbiology	Annual	X		X		X	X	
Physics	Annual	X		X		X	X	
Zoology	Annual	X		X		X	X	

- Address the needs of the developmental mathematics program in a systemic way

## College-Wide Student Learning Outcomes

Graduates from the College of Science will be able to demonstrate:

- A strong understanding of the discipline in which they major

- A high-level ability to solve problems
- Appropriate laboratory understanding and skills in the courses required for their majors
- Critical thinking skills and abilities
- Effective communication skills
- Effective skills in the use of technology, including computers

## Advising

The College of Science has a part-time general advisor who assists students in this college, primarily regarding general education. In the majority of departments in the college, the chairs advise students regarding majors and minors programs. In addition, in some departments, students are assigned advisors in specialty areas; for instance, in the physics department, a faculty member advises teaching majors, and in the geosciences and zoology departments, students are assigned advisors based on pre-professional, career, or other special interests. The following advising resources are available to students and advisors. Table LVI on page 127 shows advising content. For more specific information on advising processes in each department, see the individual department self-study.

**Standard 2: Table LV. College of Science Advising Resources.**

Department/Programs	B	C	G	Ma	Mi	P	Z
<b>Student Support</b>							
Department/Program Orientations	X		X				X
Course Embedded Advising		X			X		
Individual Advising (Faculty, Staff, Students)	X	X	X	X	X	X	X
Electronic Advising (Interactive Advising Web Page)	X	X				X	
Advising Forms (Contracts, Worksheets, Handbooks)	X	X	X		X	X	X
Feedback solicited from students on advising effectiveness	X		X	X	X	X	X
<b>Advisor Support</b>							
Advisor Training Sessions			X				
Reassigned Time			X	X		X	X
Access to Student Records through the Student Information System	X	X	X	X	X	X	
Defined Advisor Responsibilities (Policies and Procedures)			X				

Key:

B: Botany

C: Chemistry

G: Geosciences,

Ma: Mathematics

Mi: Microbiology

P: Physics

Z: Zoology

- That they have had coursework and experiences which engender greater awareness and application for the nature of science and mathematics

- Geosciences
- Mathematics
- Microbiology
- Physics
- Zoology

## Departments

- Botany
- Chemistry

## Centers

- Center for Science and Mathematics Education

### Standard 2: Table LVI. College of Science Advising Content

	Chair/ Program Director	Faculty	Staff Advisor (College*)	Secretary	When
Major Declaration in (SIS) Student Information System	B, G, Ma, Mi, P, Z	P, Z		C	One time
Program Planning					
A. Admissions Criteria to Restricted Enrollment Programs	N/A	N/A	N/A	N/A	N/A
B. General Education and Other Degree Requirements	Ma		B, C, G, Ma, Mi, P, Z		As needed
C. Major/Minor Program (Monitoring Progress, Degree Requirements, Transfer Credits, Course Selection, Electives, Internships, Practicums and Clinicals)	B, Ma, Mi, P	C, G, Z		C	As needed
Scholarships (Department and Programs)	B, G, Ma, Mi, P, Z	Z		B, C, G, P, Z	Annually
Referrals to University Resources and Services	B, G, Ma, Mi, P, Z	Z	B, C, G, Ma, Mi, P, Z	B, C, G, P, Z	As needed
Employment Advising (Interviewing, Credentialing, Licensure, Graduate and Professional Schools, Career Paths)	B, Ma, Mi, P	C, G, Ma, Mi, P, Z	B, C, G, Ma, Mi, P, Z		As needed
Graduation Clearance in the Student Information System (SIS)	B, C, G, Ma, Mi, P	P, Z			Semester prior to graduation

\* College Advisor advises students for all departments/programs within the college.

Key:

B: Botany

C: Chemistry

G: Geosciences,

Ma: Mathematics

Mi: Microbiology

P: Physics

Z: Zoology

- Chemical Technology Center
- Museum of Natural Science
- Ott Planetarium

## Degrees Offered

- Bachelor of Arts or Bachelor of Science
  - Biology Composite Teaching
  - Geology, Earth Science Teaching
  - Mathematics, Applied Mathematics, Mathematics Teaching
  - Microbiology
  - Physical Science Composite Teaching
  - Physics, Applied Physics, and Physics Teaching
  - Zoology
- Bachelor of Science
  - Applied Environmental Geoscience
  - Botany, Botany Teaching
  - Chemistry, Chemistry Teaching
- Associate of Science
  - Biotechnician
- Associate of Applied Science
  - Chemistry
- Certificate
  - Biotechnician
  - Geomatics

## Budget

In addition to legislative appropriations, we are supported by student fees; private, corporate, and governmental donations; internal and external grants; and receipts from the Ott Planetarium.

The information that follows describes the departments and programs within the College of Science.

## Botany

### I. Purpose/Description

#### Mission

Our mission is to provide a quality undergraduate education and to maximize opportunities for the promotion of effective education and communication about the value and intellectual appeal of plants. We also:

- Inspire students to pursue the study of plants
- Offer expertise about plants to policy makers and those involved in agriculture, conservation, and protection of the environment
- Inform the public about plant-derived products and environmental issues

#### Goals/Objectives

Using the WSU mission, the College of Science mission, and our mission as guides, we set goals periodically. For example, in 2002, our goals included:

- Provide high-quality studies for botany majors and minors
- Emphasize balanced field- and laboratory-based teaching
- Increase level of interdisciplinary programs
- Foster a learning environment where every member is valued
- Maintain the disciplinary culture and professionalism of botany as a distinct program

- Develop a Wetlands Management Program
- Link traditional botany with present-day implications of technology
- Increase herbarium collection

## Student Learning Outcomes Assessment and Planning:

### Outcomes Assessment and Planning:

We developed a comprehensive assessment plan which assesses student learning outcomes, including knowledge and comprehension of core concepts of plant biology; fundamental skills including field and laboratory research, critical thinking, problem solving, communications, computer use, information seeking, social responsibility, and self-assessment; basic values such as diversity appreciation, understanding of ethical issues, commitment to the development of cultural perspectives, and aesthetic appreciation; and understanding of the nature of science.

### Changes Based on Outcomes Results

included changing course content, adding/deleting/separating/combining courses, adding a course that introduces the portfolio as a means of documenting knowledge and skills, developing a two-track system of course options for majors, and creating a core set of courses common to all majors.

## Specialized Facilities/Equipment

We maintain specialized facilities and equipment including an herbarium, a greenhouse, laboratory equipment such as microscopes, spectrophotometers, and a refrigerated high-speed centrifuge, specialized software, and various chemicals.

## II. Significant Changes Since 1994

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### Significant changes include:

- Established student outcomes assessment plan

- Developed an advisement course
- Encouraged faculty to take sabbaticals to conduct research
- Implemented botany thesis option
- Pursued joint program in ornamental horticulture with Utah State University

## III. Strengths and Challenges

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### Strengths include:

- Strong mission statement in concert with plant biology programs across the country
- Significant gains in science library holdings
- Only stand-alone botany program in the Utah system of higher education.

### Challenges include:

- Determining how best to distribute students to faculty for individual advisement
- Finding funds for upgrades, repairs, and replacement of facilities and equipment
- Space to support student-involved research

## IV. Next Steps/ Action Items

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- Provide botany student handbook online
- Refine advisement issues
- Increase viability of department by initiating new general interest courses for the community
- Find financial support for Institute of American Indian Botany
- Establish certificate programs in wetland studies and horticultural therapy

## Chemistry

### I. Purpose/Description

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#### Mission

Our mission is to provide chemistry majors with the chemical skills and knowledge they

need to successfully pursue their chosen profession as well as providing:

- A solid foundation in theoretical chemistry and experimental techniques for other majors
- A general liberal education in chemistry for non-science majors
- Service requiring chemical expertise to WSU and community

## Goals/Objectives

Using the WSU mission, the College of Science mission, and our mission as guides, we set goals periodically. For example, in 2002, our goals included:

- Continue to identify teaching deficiencies to improve our programs
- Make more connections with outside businesses
- Pursue opportunities for acquiring additional space for our programs
- Alter the electives within the A.A.S. program in Chemistry so that students will have a broader range of courses from which to choose

## Student Learning Outcomes Assessment and Planning:

### Outcomes Assessment and Planning:

We developed a fundamental set of outcome standards for our graduates, including knowledge and comprehension of chemistry, problem solving, laboratory skills, presentation skills, and computer skills. These skills are assessed generally at graduation with an exit survey and using national and local exams.

### Changes Based on Outcomes Results

included adding new basic courses to the curriculum, increasing hours for certain courses, creating a new course that emphasizes applying mathematical concepts to real problems, and adding a computer applications course.

## Specialized Facilities/Equipment

We have a variety of unique facilities and equipment including:

- Gas Chromatographs
- 60 MHz Nuclear Magnetic Resonance spectrometer
- High Pressure Liquid Chromatograph
- Infrared spectrometer
- Capillary electrophoresis
- UV/Vis spectrophotometers
- Fluorescence spectrophotometer
- Sorvall Floor model centrifuge

## II. Significant Changes Since 1994

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### Significant changes include:

- Established outcomes assessment process and formed standing committee
- Established annual process for faculty review
- Added research laboratory and observatory space
- Reviewed and modified department mission, goals, and objectives
- Obtained several important pieces of equipment

## III. Strengths and Challenges

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### Strengths include:

- Commitment to assessment process
- Ability to provide individualized advisement
- Availability of facilities and equipment including research rooms, computer access, and unique and specialized research equipment

### Challenges include:

- Finding time and funding to properly collect and analyze assessment data
- Synthesizing advisement tracking data
- Increasing laboratory and faculty office space

## **IV. Next Steps/ Action Items**

- Continue outcomes assessment analysis
- Streamline analysis of academic advising data
- Explore alternative sources of funding
- Increase laboratory space

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## **Geosciences**

### **I. Purpose/Description**

#### **Mission**

Our mission is to provide an enriched learning environment through extensive interaction between faculty and students, emphasis on field studies, and use of technology-enhanced instruction. We provide general education courses that enhance student awareness, appreciation, and understanding of the physical environment and the scientific process.

We are becoming more closely allied with the Center for Science and Math Education. We also participate in the community with the Science Olympiad, science and engineering fairs, the Math, Engineering and Science Association, and courses for elementary education teachers.

#### **Goals/Objectives**

Using the WSU mission, the College of Science mission, and our mission as guides, we set goals periodically. For example, in 2002, our goals included:

- Improving our overall education program, including emphasizing practical field, laboratory, and computer applications
- Examining how the geospatial program and the remote sensing and Geographic

Information System (“GIS”) lab can be best integrated with other programs

- Promoting outreach to local schools and attract more majors to the earth sciences teaching program
- Improving laboratory facilities
- Supporting faculty and student research

### **Student Learning Outcomes Assessment and Planning:**

#### **Outcomes Assessment and Planning:**

We developed outcome standards related to understanding how scientific methodology is applied in the geosciences, thorough knowledge and understanding of core concepts, and fundamental skills such as problem solving and communication. We collected data from exit interviews, testing, analysis of writing samples, sample projects, and feedback from employers.

**Changes Based on Outcomes Results** included adding a capstone experience, adding more environmental classes, adding new upper-division courses, restructuring electives, and expanding course curriculum.

### **Specialized Facilities/Equipment**

We have a variety of unique facilities and equipment including:

- Remote Sensing GIS Laboratory
- Education Water Well Field
- Surveying and field equipment

## **II. Significant Changes Since 1994**

### **Significant changes include:**

- Revisions in curriculum
- A degree program in Applied Environmental Geosciences was added

- A certificate program in Geomatics was added
- Greater emphasis has been placed on undergraduate research
- We have developed extensive contacts with people in governmental agencies and geotechnical firms

### **III. Strengths and Challenges**

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#### **Strengths include:**

- Defined, attainable goals for learning outcomes
- Excellent, collegial faculty
- Our faculty conduct extensive research and grant writing
- A diversified curriculum

#### **Challenges include:**

- Better assess learning outcomes in general education
- Need increased support to purchase additional equipment and more effectively maintain existing equipment
- Increase salaries and reduce overload teaching to maintain faculty morale

### **IV. Next Steps/ Action Items**

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- Continue to improve curriculum and overall education programs
- Continue to increase SCHs and number of majors
- Expand faculty expertise and build bridges with other disciplines as part of a comprehensive Geosciences program
- Promote faculty and student research
- Improve laboratory equipment and facilities

## **Mathematics**

### **I. Purpose/Description**

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#### **Mission**

Our mission is to provide students with the tools necessary to competently integrate mathematics into their personal and professional lives. We also:

- Prepare majors and minors to work in industry, attend graduate school, and/or teach secondary school.
- Equip students to become lifelong learners in a changing world
- Ensure faculty vitality by allowing them to engage in scholarship, research, and other professional pursuits

#### **Goals/Objectives**

Using the WSU mission, the College of Science mission, and our mission as guides, we set goals periodically. For example, in 2002, our goals included:

- Build research groups
- Modify curriculum as suggested by national trends and our own research
- Reduce reliance on part-time faculty
- Work with local school districts to improve mathematical preparation of incoming students
- Coordinate mathematics courses throughout WSU to avoid duplication and maintain standards

#### **Student Learning Outcomes Assessment and Planning:**

##### **Outcomes Assessment and Planning:**

We developed a comprehensive assessment

plan which assesses student learning outcomes, including knowledge and comprehension of major ideas in core areas such as pure mathematics, applied mathematics, and mathematics teaching; fundamental skills such as problem solving, independent learning, technology, and communication; and effective application of appropriate mathematical ideas and/or teaching approaches.



### Changes Based on Outcomes Results

included changing course content to require more theoretical courses for majors and more specific applied courses. We also changed our teaching emphasis to match state requirements.

## II. Significant Changes Since 1994

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### Significant changes include:

- Enrollment increases in developmental mathematics
- Established student outcomes assessment plan
- Increased focus on student advising
- Added computer lab
- Changed placement policy for those with low math ACT scores
- Moved department from College of Arts & Humanities to College of Science

## III. Strengths and Challenges

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### Strengths include:

- Well-planned student assessment
- Faculty and department chair available to all students
- Large library of resource information
- Active research programs in addition to teaching

### Challenges include:

- Evaluating and reducing reliance on part-time faculty

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“The science of pure mathematics, in its modern developments, may claim to be the most original creation of the human spirit.”

— A.N. Whitehead

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- Finding more space in better classrooms
- Reducing class size
- Preparing students adequately to complete the Quantitative Literacy requirement

## IV. Next Steps/ Action Items

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- Pursue avenues to increase number of majors, such as creating joint majors with other departments (2006)
- Find space for a math lab and other functions (2006)
- Replace retiring faculty with PhD mathematicians
- Develop promising junior faculty into productive teachers and researchers

## Microbiology

### I. Purpose/Description

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#### Mission

Our mission is to provide a quality undergraduate education in both general education and discipline-specific courses. We also:

- Seek to integrate skill development, including critical thinking, problem solving, written and oral communication, and laboratory research techniques

- Provide opportunities for research and other scholarly activities
- Serve as a resource for WSU and the State of Utah in microbiology
- Provide knowledge so public will be able to make informed decisions about scientific issues that impact lives

## Goals/Objectives

Using the WSU mission, the College of Science mission, and our mission as guides, we set goals periodically. For example, in 2002, our goals included:

- Solicit more in-kind gifts
- Establish a Center for Applied and Environmental Microbiology to develop integrated curriculum and promote research involvement
- Complete a biofermentation laboratory and microbial identification laboratory facility
- Seek additional job placement connections with local and regional employers
- Increase opportunities for faculty research
- Increase space for laboratories and faculty/student research

## Student Learning Outcomes Assessment and Planning:

### Outcomes Assessment and Planning:

We developed a comprehensive assessment plan which assesses student learning outcomes, including knowledge and comprehension of microbiology core concepts; understanding science and scientific methodology as a way of knowing; fundamental skills including laboratory, critical thinking, problem solving, communications, cooperation and social responsibility, and computer use; and basic values such as understanding of ethical issues and responsibilities of scientific practice.

### Changes Based on Outcomes Results

included modifying the curriculum of Micro 2054 and Micro 3053, focusing more on skills-based laboratory exercises; started the implementation of writing, speaking, and computer analysis skills assessment.

## Specialized Facilities/Equipment

We maintain specialized facilities and equipment including two autoclaves, Class II hoods, a cell culture laboratory, a CO2 incubator, cell culture equipment, centrifuges, spectrophotometers, and biofermenters.

## II. Significant Changes Since 1994

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### Significant changes include:

- Established student outcomes assessment plan
- Increased development of learning skills component
- Increased capacity of sophomore courses with multiple lab sections
- Replaced Immunology with Microbial Ecology as a required course

## III. Strengths and Challenges

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### Strengths include:

- Comprehensive assessment plan with effective exit surveys
- Strong pre-professional advisement program
- Comprehensive curriculum with emphasis on hands-on learning
- Only stand-alone microbiology department in the Utah higher education system.

### Challenges include:

- Developing new methods to assess communication skills
- Advising students earlier in education process

- Improving reference book and online journal collection
- Finding funds for upgrades, repairs, and replacement of facilities and equipment
- Sufficient funding and space to support student research

## **IV. Next Steps/ Action Items**

- Solicit more in-kind gifts
- Refine assessment methods
- Complete operational biofermentation and microbial identification laboratories
- Increase major recruitment through junior college visits and website
- Cultivate additional job placement connections with local and regional employers

- Provide excellent instruction and counseling for all students we serve
- Promote faculty professional growth by pursuing research and other scholarly activities
- Increase global scientific knowledge through research and scholarship
- Serve the campus, the greater Ogden community, and beyond as a resource and source of expertise in physics and astronomy

## **Student Learning Outcomes Assessment and Planning:**

### **Outcomes Assessment and Planning:**

We established a Standing Committee on Assessment to carry out our assessment plan. Areas of assessment include thorough knowledge and comprehension of core concepts of classical and modern physics; basic skills such as presentation, laboratory, computer, and problem-solving skills; application of physics experience to new situations; understanding of the nature of science; and, for teaching majors, basic teaching strategies. We assess these skills by analyzing student grades, written assignments, lab reports, senior presentations, employment rates, and national tests.

**Changes Based on Outcomes Results** include modification of computer language course requirements, changing course content, and adding new required and elective courses.

## **Physics**

### **I. Purpose/Description**

#### **Mission**

Our mission is to provide high-quality physics instruction at the undergraduate level including providing:

- Courses in physical sciences general education
- Pre-professional and pre-engineering courses in physics
- Courses and programs for physics majors and minors

#### **Goals/Objectives**

Using the WSU mission, the College of Science mission, and our mission as guides, we set goals periodically. For example, in 2002, our goals included:

### **Specialized Facilities/Equipment**

We have a large number of specialized facilities and equipment, including a planetarium; an observatory; nuclear physics, optics, electronics, and special research laboratories; oscilloscopes; lasers; spectroscopic equipment; atomic force and scanning tunneling microscopes; and nuclear radiation detectors.

## II. Significant Changes Since 1994

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### Significant changes include:

- Initiated student learning outcomes assessment
- Removed Engineering Physics degree option in 1995 and significantly revised the Applied Physics option
- Obtained several important pieces of equipment
- Established two small research laboratories and built an on-campus observatory

## III. Strengths and Challenges

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### Strengths include:

- Academic advising to help students make informed decisions regarding their programs of study
- Electronic access is available to most major journals and on-line databases
- Private funding for scholarships and student research fellowships
- Faculty dedicated to teaching and mentoring physics students in undergraduate research
- Active undergraduate research program

### Challenges include:

- Finding time and funding to properly collect and analyze assessment data
- Improving review process for part-time faculty
- Improving facilities to include additional office and laboratory space
- Improving funding and time for professional development and undergraduate research

## IV. Next Steps/ Action Items

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- Supplement budget with student fees and private donations

- Seek alternative sources of funding to support the purchase or donation of major pieces of equipment
- Continue outcomes assessment

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## Zoology

### I. Purpose/Description

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#### Mission

Our mission is to train students for diverse careers as biologists and entry into graduate and professional schools. We also:

- Engage students in creative scholarship and critical thinking
- Provide courses that explore animal biology at the molecular, cellular, organismal, and ecological levels
- Help students develop additional skills fundamental to success regardless of specification

#### Goals/Objectives

Using the WSU mission, the College of Science mission, and our mission as guides, we set goals periodically. For example, in 2002, our goals included:

- Continued excellence in all aspects of our programs including offering outstanding teaching, including research opportunities, and excellent advising for our students.
- Develop assessment protocols
- Remodel a portion of the Engineering Tech building to create an ecology teaching laboratory and faculty/student research spaces
- Orient new faculty members and plan for additional new hires in the future

- Investigate new ways to stretch our operating budget, such as through implementation of new laboratory fees.
- Continue to coordinate a funded student research emphasis and seek external funding for this

### **Student Learning Outcomes Assessment and Planning:**

#### **Outcomes Assessment and Planning:**

We developed a comprehensive assessment plan which assesses student learning outcomes, including knowledge of the nature of scientific inquiry, the role of evolution, the importance of genetics, the relationship between structure and function, and the organization of life; appreciation of animals; knowledge of career opportunities; and knowledge of other skills such as computer applications, laboratory and field research techniques, written and oral communication, and reading and evaluating scientific literature.

**Changes Based on Outcomes Results** included significantly revising major requirements, including dropping some courses, modifying others, establishing new required courses, and changing options.

### **Specialized Facilities/Equipment**

We maintain four major teaching laboratories, including a new lab for the Human Anatomy course and a one-of-a-kind DNA laboratory.

## **II. Significant Changes Since 1994**

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#### **Significant changes include:**

- Changed systematic assessment of program
- Revised major requirements
- Cancelled teaching major

## **III. Strengths and Challenges**

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#### **Strengths include:**

- Effective advising program, particularly for post-graduate work
- Strong community interface including with secondary schools, Center for Science and Mathematics Education, Expanding Your Horizons, and Operation Smile
- High quality specimen collections

#### **Challenges include:**

- Translating outcomes assessment findings into practical teaching and learning practices
- Finding secure storage space

## **IV. Next Steps/ Action Items**

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- Consolidate current space and find more
- Limit laboratory courses to 20 students
- Reorganize premedical advising program
- Establish laboratory fee structure
- Hire more part-time faculty

## Centers

The following table shows the centers associated with this college and their missions:

**Standard 2: Table LVII. College of Science Centers**

Center	Mission
Center for Science and Mathematics Education	Our mission is to provide: <ul style="list-style-type: none"> <li>• Training and advisement for secondary education and mathematics teaching majors</li> <li>• Coordination for science and mathematics education throughout WSU programs and with the State of Utah and local school districts</li> <li>• In-service training for science and mathematics teachers</li> <li>• Opportunities for K-12 students in science and mathematics</li> </ul>
Chemical Technology Center	Our mission is to enhance the learning environment by involving students in meaningful extra-curricular learning activities through numerous community partnerships. For further information, see our self-study online or in the Exhibit Room.
Museum of Natural Science	Our mission is to serve as an extension of the classroom. We host educational exhibits such as Spices and the Exploration of the World, Light and Color, The Grand Staircase, and Fathers Escalante and Dominguez. For further information, see our self-study online or in the Exhibit Room.
Ott Planetarium	Our mission is to provide educational support and public outreach. We provide an immersive learning environment and interesting and educational programming for school districts and the general public. We have formed community partnerships with the Clark Planetarium in Salt Lake City, the George S. Eccles Dinosaur Park, and the Ogden Astronomical Society. For further information, see our self-study online or in the Exhibit Room.