

**College of Science  
Proposed Catalog Changes  
Effective Summer 2020**

**Department of Biological Sciences**

1. Drop the following courses:

**BIOL 154 Introductory Microbiology**

**3 credits**

*Gen Ed: Natural and Applied Sciences*

Carries no credit after BIOL 250. May be taken by microbiology majors, but carries no credit after BIOL 250. Introduction to microorganisms and their role in disease, health, foods, and the environment; current topics in microbiology. (Spring only)

**Rationale:** This course is no longer taught in the Biological Sciences department, but is now taught as EPPN 154.

**BIOL 155 Introductory Microbiology Laboratory**

**1 credits**

*Gen Ed: Natural and Applied Sciences*

May be taken by microbiology majors but carries no credit after BIOL 255. Introductory laboratory training in basic microbiology; includes sterile technique, bacterial enumeration methods, culturing techniques, yogurt preparation and analysis, recombinant DNA techniques. Three hrs lab a wk. (Spring only)

**Coreq:** BIOL 154 .

**Rationale:** This course is no longer taught in the Biological Sciences department, but is now taught as EPPN 155.

**BIOL 405 Practicum in Anatomy Laboratory Teaching**

**2-4 credits, max 8**

*Gen Ed: Senior Experience*

Organization, preparation, and teaching of anatomy laboratory objectives under faculty supervision. (Fall only)

**Prereq:** Permission.

**Rationale:** Combining BIOL 405 (Practicum in Anatomy Laboratory Teaching) and BIOL 408 (Practicum in Human Physiology Laboratory Teaching) since the Anatomy and Physiology classes are being restructured. This course is no longer needed.

2. Change the following courses:

**BIOL 102 Biology and Society**

**3 credits**

*Gen Ed: Natural and Applied Sciences*

Not open to majors or for minor credit. ~~Principles of biology and their relationship to social issues. Three lecture and one 3-hour lab a week.~~ Study of ecology, evolution, cells, heredity, and human body processes with a focus on connecting to issues in society. Three lectures per week.

**Rationale:** Update details of course content and emphasis.

**BIOL 102L Biology and Society Lab**

**1 credit**

*Gen Ed: Natural and Applied Sciences*

Not open to ~~Biology~~-majors or for minor credit. ~~Principles of biology and their relationship to social issues. Three lectures and one 3-hour lab a week.~~ The lab follows Biology 102 lecture topics and offers hand-on practice and experimentation with core course concepts. It is strongly recommended that lecture and lab be taken in the same semester. One 3-hour lab per week.

**Rationale:** Update details of course content, and emphasize that lecture and lab should be taken in the same semester.

**BIOL 114 Organisms and Environments**

**4 credits**

*Gen Ed: Natural and Applied Sciences*

~~The evolution of diversity, the biology of plants and animals, and their environments.~~ Topics include an overview of ecology and a detailed foundation in evolutionary processes and the diversity of life; intended for students in biology-related majors. Three lectures and one 3-hour lab ~~a~~per week.

**Rationale:** Update details of course content and emphasis.

**BIOL 115 Cells & the Evolution of Life**

**3 credits**

*Gen Ed: Natural and Applied Sciences*

~~The cell, heredity and evolutionary processes.~~ This course provides a detailed foundation of biomolecules, the cell, metabolism, and heredity; intended for students in biology-related majors. Three lectures per week.

**Prereq** ~~or Coreq~~: CHEM 101 and CHEM 101L or CHEM 111 and CHEM 111L.

**Rationale:** Multi-year data has shown that taking CHEM 101/101L or CHEM 111/111L as a co-requisites does not provide sufficient preparation for BIOL 115. Therefore, CHEM 101/101L or CHEM 111/111L are now required as prerequisites only.

The new description updates details of course content and emphasis.

### **BIOL ~~120~~220 ~~Human Anatomy~~ Anatomy & Physiology I**

**4 credits**

~~Study of the anatomy of the major organ systems of the human body; lab consists of studying human gross anatomy models and prosected cadavers.~~ Study of the general organization of the human body and its function, followed by more specific study of the anatomy and physiology of the integumentary, skeletal, muscular, cardiovascular, and respiratory systems. Labs include anatomical models, prosected cadavers, and physiological data collection software. Three lectures and one 3-hour lab per week. (Fall only)

**Prereq:** BIOL 102 or BIOL 115

**Rationale:** Combining anatomy and physiology courses will place these courses in alignment with all other Idaho Higher Education Institutions that offer human anatomy and physiology at the undergraduate level. This will enable transfer students to more easily articulate to UI without retaking portions of a course series.

Furthermore, the body systems of focus in A&P I of a combined course series will allow majors that currently require only four credits of anatomy and physiology (e.g. Dance) to eliminate the need for students to take an additional four credits of electives to cover the entire anatomy and physiology series as is currently needed with an anatomy-only and physiology-only course series.

The 200 level distinction will more closely reflect the content delivery currently being taught, and also assist students articulating to multiple graduate programs requiring at least a 200 level anatomy and physiology course.

Adding a prerequisite requirement will eliminate the need of having repeat topics in several course curricula – general topics taught in proposed prerequisite courses are currently covered additionally for approximately three weeks of curricula in the current course – allowing curricula development of more specific anatomical and physiological topics pursuant to the new course description.

### **BIOL ~~121~~221 ~~Human Physiology~~ Anatomy & Physiology II**

**4 credits**

~~Study of the physiology of the major organ systems of the human body.~~ Continuation of the study of the organization of the human body and its function, including specific study of the anatomy and physiology of the nervous, endocrine, digestive, urinary, and reproductive systems. Labs include anatomical models, prosected cadavers, and physiological data collection software. Three lectures and one 3-hour lab ~~a~~per week. (Spring only)

**Prereq:** ~~BIOL 120~~ 220.

**Rationale:** Combining anatomy and physiology courses will place these courses in alignment with all other Idaho Higher Education Institutions that offer human anatomy and physiology at the undergraduate level. This will enable transfer students to more easily articulate to UI without retaking portions of a course series.

In addition, the 200 level distinction will more closely reflect the content delivery currently being taught, and also assist students articulating to multiple graduate programs requiring at least a 200 level anatomy and physiology course.

Adding a prerequisite requirement will eliminate the need of having repeat topics in several course curricula – general topics taught in proposed prerequisite courses are currently covered additionally for approximately three weeks of curricula in the current course – allowing curricula development of more specific anatomical and physiological topics pursuant to the new course description.

### **BIOL 301 Undergraduate Research**

~~1-4~~ **0-4 credits, max 8**

Undergraduate research for students without senior standing. [BIOL 301 cannot be used for upper-division elective requirement credit in degrees offered by the Department of Biological Sciences.](#)

**Prereq:** Permission.

**Rationale:** The proposal to allow 0 credit for this course (Biol 301) is to accommodate student volunteers who wish to work in a research laboratory. This permits a student volunteer to participate in research and gain experiential learning at no cost.

Clarification of major requirements for students and advisors.

### **BIOL 401 Undergraduate Research**

**1-4 credits, max 8**

*Gen Ed: Senior Experience*

Undergraduate research at the senior level. [BIOL 401 cannot be used for major upper-division elective requirement credit in degrees offered by the Department of Biological Sciences.](#)

**Prereq:** Senior Standing and Permission of Instructor.

**Rationale:** Clarification of major requirements for students and advisors.

### **BIOL 408 ~~Practicum in Human Physiology Laboratory Teaching~~ [Human Anatomy & Physiology Laboratory Pedagogy](#)**

**2-4 credits, max 8**

*Gen Ed: Senior Experience*

~~Organization, preparation, and teaching of human physiology laboratory objectives under faculty supervision. (Spring only)~~ [Developing presentations, learning assessments, and grading schemas for undergraduate anatomy and physiology courses. Includes specimen preparation, data collection](#)

[and analysis. Fall and Spring semester/variable credit. 2 credits per each 3 hour lab per week, one hour lab meeting per week.](#)

**Prereq:** ~~BIOL 121 and~~[Instructor](#) Permission.

**Rationale:** Change of course title to align with proposed changes of a combined Anatomy and Physiology course series (BIOL 220 and BIOL 221) from the current BIOL 120 and BIOL 121 series. Change of course title and description utilize current education vernacular and more specifically outline course requirements and content.

### **BIOL 456 Computer Skills for Biologists**

**3 credits**

Joint-listed with BIOL 549

~~Management and analysis of complicated datasets such as those in molecular evolution, systematics, and genomics. Demonstrations, exercises, and student projects to teach advanced Unix skills, programming (e.g. Perl and R), and data management. Cooperative: open to WSU degree-seeking students. (Fall, alt/even yrs)~~ [Exploration and analysis of biological datasets such as those in molecular evolution, systematics, and genomics. Demonstrations, exercises, and student projects to teach Unix skills, git version control, and computer programming for data exploration and analysis. Graduate credit requires a project and presentation. Cooperative: open to WSU degree-seeking students. \(Fall, alt/even years\)](#)

**Prereq:** BIOL 310 and STAT 251 or STAT 301; or Permission

**Rationale:** Update details of course content and emphasis.

### **BIOL 545 ~~Principles of Systematic Biology~~ [Phylogenetics](#)**

**3 credits**

The inference of evolutionary trees (phylogeny) and the processes that generate biodiversity from analyses of morphological, molecular, and behavioral data; uses of phylogenies in testing evolutionary and other hypotheses at both inter and intraspecific levels. Two hours of lecture and one 3-hour lab per week. Cooperative: open to WSU degree-seeking students. (Spring, Alt/yrs)

**Prereq:** PLSC 205 or BIOL 213 and BIOL 310 .

**Rationale:** Title change more accurately reflects course content and emphasis.

### **BIOL 549 Computer Skills for Biologists**

**3 credits**

Joint-listed with BIOL 456

~~Management and analysis of complicated datasets such as those in molecular evolution, systematics, and genomics. Demonstrations, exercises, and student projects to teach advanced Unix skills, programming (e.g. Perl and R), and data management. Cooperative: open to WSU degree-seeking students. (Fall, alt/even yrs)~~ [Exploration and analysis of biological datasets such as those in molecular evolution, systematics, and genomics. Demonstrations, exercises, and student projects to](#)

[teach Unix skills, git version control, and computer programming for data exploration and analysis. Graduate credit requires a project and presentation. Cooperative: open to WSU degree-seeking students. \(Fall, alt/even years\)](#)

**Prereq:** BIOL 310 and STAT 251 or STAT 301; or Permission

**Rationale:** Update details of course content and emphasis.

3. Make the following curricular changes to the **B.A. and B.S. in Biology**:

## **Biology (B.A. or B.S.)**

To graduate in this program, students must earn a minimum grade of "C" in BIOL 114, BIOL 115, and BIOL 115L. Required course work includes the university requirements (see regulation J-3) and:

BIOL 114	Organisms and Environments	4
BIOL 115	Cells & the Evolution of Life	3
BIOL 115L	Cells and the Evolution of Life Laboratory	1
BIOL 213	Principles of Biological Structure and Function	4
BIOL 300	Survey of Biochemistry	3-4
or BIOL 380	Biochemistry I	
BIOL 310	Genetics	3
BIOL 312	Molecular and Cellular Biology	3
BIOL 313	Molecular and Cellular Laboratory	1
BIOL 314	Ecology and Population Biology	4
BIOL 315	Genetics Lab	1
BIOL 400	Seminar	1-16
BIOL 421	Advanced Evolution/Population Dynamics	3
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Laboratory	1
CHEM 112	General Chemistry II	3
CHEM 112L	General Chemistry II Laboratory	2
CHEM 277	Organic Chemistry I	3
CHEM 278	Organic Chemistry I: Lab	1
MATH 170	Calculus I	4
STAT 251	Statistical Methods	3
or STAT 301	Probability and Statistics	
Select one of the following Senior Experience courses		2
BIOL 401	Undergraduate Research (Max 8 credits)	

BIOL 405	Practicum in Anatomy Laboratory Teaching (Max 8 credits)	
BIOL 407	Practicum in Biology Laboratory Teaching (Max 12 credits)	
BIOL 408	Practicum in Human Physiology Laboratory Teaching (Max 8 credits)	
BIOL 411	Senior Capstone	
Select one of the following:		3
ENGL 207	Persuasive Writing	
ENGL 208	Personal & Exploratory Writing	
ENGL 317	Technical Writing	
<a href="#">ENGL 318</a>	<a href="#">Science Writing</a>	
Select one of the following:		4
PHYS 111 & 111L	General Physics I and General Physics I Lab	
PHYS 211 & 211L	Engineering Physics I and Laboratory Physics I	
Select one of the following:		4
PHYS 112 & 112L	General Physics II and General Physics II Lab	
PHYS 212 & 212L	Engineering Physics II and Laboratory Physics II	
Select 14 credits of approved electives <a href="#">from the following:</a>		14
<a href="#">BIOL 324</a>	<a href="#">Comparative Vertebrate Anatomy</a>	
<a href="#">BIOL 416</a>	<a href="#">Plant Diversity and Evolution</a>	
<a href="#">BIOL 423</a>	<a href="#">Comparative Vertebrate Physiology</a>	
<a href="#">BIOL 425</a>	<a href="#">Special Topics: Experimental Field Ecology</a>	
<a href="#">BIOL 428</a>	<a href="#">Microscopic Anatomy</a>	
<a href="#">BIOL 432</a>	<a href="#">Immunology</a>	
<a href="#">BIOL 433</a>	<a href="#">Pathogenic Microbiology</a>	
<a href="#">BIOL 444</a>	<a href="#">Genomics</a>	
<a href="#">BIOL 447</a>	<a href="#">Virology</a>	
<a href="#">BIOL 456</a>	<a href="#">Computer Skills for Biologists</a>	
<a href="#">BIOL 460</a>	<a href="#">Advanced Field Botany</a>	
<a href="#">BIOL 461</a>	<a href="#">Neurobiology</a>	
<a href="#">BIOL 474</a>	<a href="#">Principles of Developmental Biology</a>	
<a href="#">BIOL 478</a>	<a href="#">Animal Behavior</a>	
<a href="#">BIOL 482</a>	<a href="#">Protein Structure and Function</a>	
<a href="#">BIOL 483</a>	<a href="#">Mammalogy</a>	
<a href="#">BIOL 484</a>	<a href="#">Invertebrate Zoology</a>	

<a href="#">BIOL 485</a>	<a href="#">Prokaryotic Molecular Biology</a>
<a href="#">BIOL 487</a>	<a href="#">Eukaryotic Molecular Genetics</a>
<a href="#">BIOL 489</a>	<a href="#">Herpetology</a>
<a href="#">CHEM 473</a>	<a href="#">Intermediate Organic Chemistry</a>
<a href="#">ENT 411</a>	<a href="#">Veterinary &amp; Medical Entomology</a>
<a href="#">ENT 438</a>	<a href="#">Pesticides in the Environment</a>
<a href="#">ENT 441</a>	<a href="#">Insect Ecology</a>
<a href="#">ENT 469</a>	<a href="#">Introduction to Forest Insects</a>
<a href="#">ENT 476</a>	<a href="#">Medical Parasitology</a>
<a href="#">ENT 480</a>	<a href="#">Arthropod and Nematode Physiology</a>
<a href="#">FISH 481</a>	<a href="#">Ichthyology</a>
<a href="#">MATH 437</a>	<a href="#">Mathematical Biology</a>
<a href="#">PLSC 415</a>	<a href="#">Plant Pathology</a>
<a href="#">PLSC 440</a>	<a href="#">Advanced Laboratory Techniques</a>
<a href="#">PLSC 476</a>	<a href="#">Cell Biology</a>
<a href="#">PLSC 488</a>	<a href="#">Genetic Engineering</a>
<a href="#">WLF 440</a>	<a href="#">Conservation Biology</a>
<a href="#">WLF 448</a>	<a href="#">Fish and Wildlife Population Ecology</a>
<a href="#">WLF 482</a>	<a href="#">Ornithology</a>

Total Hours	78-94
-------------	-------

**Biology B.A. Students must also complete:**

Two humanities courses in addition to the minimum university-wide general education requirements <sup>1</sup>	6
One Social Science course in addition to the minimum university-wide general education requirements <sup>1</sup>	3
0-16 credits in a foreign language <sup>2</sup>	0-16
Total Hours	9-25

<sup>1</sup> Courses satisfying the humanities requirement are those dealing with the arts, literature, and philosophy. Courses satisfying the social science requirement are those courses dealing with a person's social condition including social relations, institutions, history, and participation in an organized community. Refer to online degree audit system through Web registration system or your academic advisor for a listing of appropriate courses.

<sup>2</sup> Foreign Languages 0-16 credits (zero-four courses) competence in one foreign language equivalent to that gained by the completion of four semesters of college courses through the



intermediate level. This requirement may be satisfied by the completion of either of the following options

1. 16 credits or four high-school units in one foreign language, or
2. 12 credits in one foreign language, and one three-credit course in literature translated from the same language. The 12 credits may be satisfied by three high-school units in one foreign language.

### **Courses to total 120 credits for this degree**

**Rationale:** Two areas of the curriculum are to be changed. One is a simple addition of one course to the allowed writing courses. The other is the addition of three courses to the list of approved electives. NOTE: up until the 2017 catalog, the list appeared as below. Somehow, that list was dropped from the listing in the 2018 catalog (without our request for such to happen), and the 2018 and 2019 catalogs simply say "14 credits in approved electives". We request the list be reinstated, with the noted additions. The minor adjustments noted here will not result in changes to the learning outcomes or assessment plan for the degree.

ENT 410, ENT 476 and ENT 480 are being added as appropriate courses for Biology electives, and ENGL 318 is highly appropriate for the writing requirement.

4. Make the following curricular changes to the **B.S. in Medical Sciences**:

### **Medical Sciences (B.S.)**

To graduate in this program, students must earn a minimum grade of "C" in BIOL 115 and BIOL 115L. Required course work includes the university requirements (see regulation J-3) and:

BIOL 115	Cells & the Evolution of Life	3
BIOL 115L	Cells and the Evolution of Life Laboratory	1
BIOL 120	Human Anatomy	4
BIOL 121	Human Physiology	4
BIOL 204	Special Topics	1-16
BIOL 250	General Microbiology	3
BIOL 255	General Microbiology Lab	2
BIOL 310	Genetics	3
BIOL 312	Molecular and Cellular Biology	3
BIOL 313	Molecular and Cellular Laboratory	1
BIOL 315	Genetics Lab	1
BIOL 380	Biochemistry I	4
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Laboratory	1

CHEM 112	General Chemistry II	3
CHEM 112L	General Chemistry II Laboratory	2
CHEM 277	Organic Chemistry I	3
CHEM 278	Organic Chemistry I: Lab	1
MATH 170	Calculus I	4
PHIL 103	Introduction to Ethics	3
PSYC 101	Introduction to Psychology	3
SOC 101	Introduction to Sociology	3
STAT 251	Statistical Methods	3
or STAT 301	Probability and Statistics	
Select one of the following Physics sequences:		8
PHYS 111 & 111L	General Physics I and General Physics I Lab	
PHYS 112 & 112L	General Physics II and General Physics II Lab	
OR		
PHYS 211 & 211L	Engineering Physics I and Laboratory Physics I	
PHYS 212 & 212L	Engineering Physics II and Laboratory Physics II	
Select 3 credits of Written Communication courses from the following:		3
ENGL 208	Personal & Exploratory Writing	
ENGL 317	Technical Writing	
ENGL 318	Science Writing	
Select one of the following Senior Capstone courses:		2
BIOL 401	Undergraduate Research (Max 8 credits)	
BIOL 405	Practicum in Anatomy Laboratory Teaching (Max 8 credits)	
<a href="#">BIOL 407</a>	<a href="#">Practicum in Biology Laboratory Teaching</a>	
BIOL 408	Practicum in Human Physiology Laboratory Teaching (Max 8 credits)	
BIOL 411	Senior Capstone	
Select one of the following:		3
ANTH 417 or SOC 417	Social Data Analysis	
BIOL 456	Computer Skills for Biologists	
CHEM 302	Principles of Physical Chemistry	
MATH 437	Mathematical Biology	
STAT 431	Statistical Analysis	

Select 3 credits of Critical Thinking courses from the following:	3
ENGL 207 Persuasive Writing	
HIST 382 History of Biology: Conflicts and Controversies	
PHIL 201 Critical Thinking	
PHIL 202 Introduction to Symbolic Logic	
<a href="#">PHIL 417</a> <a href="#">Philosophy of Biology</a>	
Select 2-3 credits of Leadership and Professional courses from the following:	2-3
BIOL 398 Internship	
MHR 311 Introduction to Management	
INTR 492 College of Science Ambassadors (Max 8 credits)	
INTR 496 Pre-Health Peer Mentors (Max 4 credits)	
PHIL 361 Professional Ethics (Max 6 credits)	
PSYC 414 Traumatic Events: Preparation, Intervention, Evaluation	
Select 6 credits of Psychology courses from the following:	6
PSYC 305 Developmental Psychology	
PSYC 311 Abnormal Psychology	
PSYC 325 Cognitive Psychology	
PSYC 372 Physiological Psychology	
PSYC 470 Introduction to Chemical Addictions	
PSYC 472 Introduction to the Pharmacology of Psychoactive Drugs	
Select 6 credits of Global and Cultural Competence courses from the following:	6
ANTH 327 Belief Systems	
ANTH 427 Racial and Ethnic Relations	
COMM 335 Intercultural Communication	
FCS 411 Global Nutrition	
HIST 380 Disease and Culture:History of Western Medicine	
JAMM 340 Cultural Diversity and the Media	
PHIL 367 Global Justice	
POLS 385 Political Psychology	
SOC 201 Introduction to Inequalities & Inclusion	
SOC 340 Social Change & Globalization	
Select 9 credits of Biomedical Sciences courses from the following:	9
BE 425 Introduction to Biomedical Engineering	
BIOL 314 Ecology and Population Biology	
BIOL 324 Comparative Vertebrate Anatomy	
BIOL 421 Advanced Evolution/Population Dynamics	
BIOL 428 Microscopic Anatomy	

BIOL 432	Immunology	
BIOL 433	Pathogenic Microbiology	
BIOL 444	Genomics	
BIOL 447	Virology	
BIOL 454	Biochemistry II	
BIOL 461	Neurobiology	
BIOL 474	Developmental Biology	
BIOL 482	Protein Structure and Function	
BIOL 487	Eukaryotic Molecular Genetics	
CHEM 372	Organic Chemistry II	
<a href="#">ENT 411</a>	<a href="#">Veterinary and Medical Entomology</a>	
<a href="#">ENT 476</a>	<a href="#">Medical Parasitology</a>	
FCS 361	Advanced Nutrition	
H&S 450	Critical Health Issues	
H&S 451	Psychosocial Determinants of Health	
Total Hours		101-117

### Courses to total 120 credits for this degree

**Rationale:** Three changes are requested. One adds BIOL 407 as an allowable choice in the “Senior Experience” requirement for this degree. One adds a course to the list of electives in Critical Thinking. The third adds two courses to the Biomedical Sciences electives list. This minor adjustment will not impact the learning outcomes or assessment plan for the degree.

BIOL 407 is listed in the “senior experience” options for all of the other degrees offered by Biological Sciences, but was somehow left off the list for the Medical Sciences degree when it was created.

ENT 411 and ENT 476 are appropriate courses for Medical Science electives. PHIL 417 is an excellent course for the critical thinking elective in this degree.

5. Make the following curricular changes to the **B.S.Biochem. in Biochemistry**:

### Biochemistry (B.S.Biochem.)

To graduate in this program, students must earn a minimum grade of "C" in BIOL 114 , BIOL 115, and BIOL 115L. Required course work includes the university requirements (see regulation J-3) and:

BIOL 114	Organisms and Environments	4
BIOL 115	Cells & the Evolution of Life	3

BIOL 115L	Cells and the Evolution of Life Laboratory	1
BIOL 310	Genetics	3
BIOL 315	Genetics Lab	1
BIOL 312	Molecular and Cellular Biology	3
BIOL 313	Molecular and Cellular Laboratory	1
BIOL 380	Biochemistry I	4
BIOL 382	Biochemistry I Laboratory	2
BIOL 400	Seminar	1-16
BIOL 454	Biochemistry II	3
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Laboratory	1
CHEM 112	General Chemistry II	3
CHEM 112L	General Chemistry II Laboratory	2
CHEM 253	Quantitative Analysis	3
CHEM 254	Quantitative Analysis: Lab	2
CHEM 277	Organic Chemistry I	3
CHEM 278	Organic Chemistry I: Lab	1
CHEM 372	Organic Chemistry II	3
MATH 170	Calculus I	4
MATH 175	Calculus II	4
PHYS 211	Engineering Physics I	3
PHYS 211L	Laboratory Physics I	1
PHYS 212	Engineering Physics II	3
PHYS 212L	Laboratory Physics II	1
STAT 251	Statistical Methods	3
<a href="#">or STAT 301</a>	<a href="#">Probability and Statistics</a>	
Select one of the following Senior Experience courses		2
BIOL 401	Undergraduate Research	
BIOL 405	Practicum in Anatomy Laboratory Teaching	
BIOL 407	Practicum in Biology Laboratory Teaching	
BIOL 408	Practicum in Human Physiology Laboratory Teaching	
BIOL 411	Senior Capstone	
Select electives from the following: <sup>1</sup>		6
BE 433	Bioremediation	
BIOL 426	Systems Biology	
BIOL 432	Immunology	
BIOL 444	Genomics	

BIOL 461	Neurobiology	
BIOL 482	Protein Structure and Function	
BIOL 485	Prokaryotic Molecular Biology	
BIOL 487	Eukaryotic Molecular Genetics	
CHEM 374	Organic Chemistry II: Lab	
CHEM 472	Medicinal Chemistry	
CHEM 473	Intermediate Organic Chemistry	
FS 520	Instrumental Analysis	
PLSC 486	Plant Biochemistry	
PLSC 488	Genetic Engineering	
Select one of the following:		3
ENGL 207	Persuasive Writing	
ENGL 208	Personal & Exploratory Writing	
ENGL 317	Technical Writing	
<a href="#">ENGL 318</a>	<a href="#">Science Writing</a>	
Select one of the following:		3
CHEM 302	Principles of Physical Chemistry	
CHEM 305	Physical Chemistry	
CHEM 306	Physical Chemistry II	
Total Hours		80-95

### Courses to total 120 credits for this degree

<sup>1</sup> Additional classes can be substituted with prior approval from advisor and chairperson

**Rationale:** Two small changes are requested. One simply adds STAT 301 as an allowable statistics course. The other adds a new course to the list of possible choices for the writing requirement. This minor change will not impact learning outcomes or assessment plan.

ENGL 318 is a suitable addition for meeting the Writing Course requirement for this major, and STAT 301 is actually a more rigorous treatment of material than what is given in STAT 251.

6. Make the following curricular changes to the **B.S.M.B.B. in Molecular Biology and Biotechnology**:

## **Molecular Biology and Biotechnology (B.S.M.B.B.)**

To graduate in this program, students must earn a minimum grade of "C" in BIOL 114, BIOL 115, and BIOL 115L. Required course work includes the university requirements (see regulation J-3) and:

BIOL 114	Organisms and Environments	4
BIOL 115	Cells & the Evolution of Life	3
BIOL 115L	Cells and the Evolution of Life Laboratory	1
BIOL 250	General Microbiology	3
BIOL 255	General Microbiology Lab	2
BIOL 310	Genetics	3
BIOL 315	Genetics Lab	1
BIOL 312	Molecular and Cellular Biology	3
BIOL 313	Molecular and Cellular Laboratory	1
BIOL 380	Biochemistry I	4
BIOL 382	Biochemistry I Laboratory	2
BIOL 400	Seminar	1-16
BIOL 454	Biochemistry II	3
BIOL 485	Prokaryotic Molecular Biology	3
or BIOL 487	Eukaryotic Molecular Genetics	
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Laboratory	1
CHEM 112	General Chemistry II	3
CHEM 112L	General Chemistry II Laboratory	2
CHEM 277	Organic Chemistry I	3
CHEM 278	Organic Chemistry I: Lab	1
CHEM 372	Organic Chemistry II	3
MATH 170	Calculus I	4
PLSC 488	Genetic Engineering	3
STAT 251	Statistical Methods	3
or STAT 301	Probability and Statistics	
Select 8-10 credits of Approved Electives from the following:		8-10
BIOL 432	Immunology	
BIOL 433	Pathogenic Microbiology	
BIOL 444	Genomics	

BIOL 447	Virology
BIOL 461	Neurobiology
BIOL 474	Developmental Biology
BIOL 482	Protein Structure and Function
BIOL 485	Prokaryotic Molecular Biology <sup>2</sup>
BIOL 487	Eukaryotic Molecular Genetics
FS 416	Food Microbiology
FS 417	Food Microbiology Laboratory
<a href="#">PHIL 361</a>	<a href="#">Professional Ethics</a>
<a href="#">or PHIL 450</a>	<a href="#">Ethics in Science</a>
PLSC 476	Cell Biology

Select four credits from the following: 4

BIOL 301	Undergraduate Research
BIOL 401	Undergraduate Research
BIOL 499	Directed Study
PLSC 440	Advanced Laboratory Techniques

Select one of the following Senior Experience courses: 2

BIOL 401	Undergraduate Research
BIOL 405	Practicum in Anatomy Laboratory Teaching
BIOL 407	Practicum in Biology Laboratory Teaching
BIOL 408	Practicum in Human Physiology Laboratory Teaching
BIOL 411	Senior Capstone

Select one of the following: 3

ENGL 207	Persuasive Writing
ENGL 208	Personal & Exploratory Writing
ENGL 317	Technical Writing
<a href="#">ENGL 318</a>	<a href="#">Science Writing</a>

Select one of the following sequences: 4

PHYS 111 & 111L	General Physics I and General Physics I Lab
PHYS 211 & 211L	Engineering Physics I and Laboratory Physics I

Select one of the following: 4

PHYS 112 & 112L	General Physics II and General Physics II Lab
PHYS 212 & 212L	Engineering Physics II and Laboratory Physics II



Total Hours

85-102

**Courses to total 120 credits for this degree**

- <sup>1</sup> Additional classes can be substituted with prior approval from advisor and chairperson.
- <sup>2</sup> Either BIOL 485 or BIOL 487 may be used as an elective if not taken above as a required course.

**Rationale:** Two changes are requested. One adds two courses to the list of Approved Electives. The other simply adds one more choice to the list of options for writing courses. This minor change does not impact the learning outcomes or assessment plan for the degree.

PHIL 361 and 450 are appropriate electives for the major. However, the intent is that this is one entry in the elective choices – that is, a student may use at most one of these two courses towards the major.

ENGL 318 is a suitable addition for meeting the Writing Course requirement for this major.

7. Make the following curricular changes to the **B.S.Microbiol. in Microbiology**:

**Microbiology (B.S.Microbiol.)**

To graduate in this program, students must earn a minimum grade of "C" in BIOL 114, BIOL 115, and BIOL 115L. Required course work includes the university requirements (see regulation J-3) and:

BIOL 114	Organisms and Environments	4
BIOL 115	Cells & the Evolution of Life	3
BIOL 115L	Cells and the Evolution of Life Laboratory	1
BIOL 250	General Microbiology	3
BIOL 255	General Microbiology Lab	2
BIOL 310	Genetics	3
BIOL 315	Genetics Lab	1
BIOL 312	Molecular and Cellular Biology	3
BIOL 313	Molecular and Cellular Laboratory	1
BIOL 380	Biochemistry I	4
BIOL 400	Seminar	1-16
BIOL 401	Undergraduate Research	1-4
or BIOL 301	Undergraduate Research	
or PLSC 440	Advanced Laboratory Techniques	
CHEM 111	General Chemistry I	3

CHEM 111L	General Chemistry I Laboratory	1
CHEM 112	General Chemistry II	3
CHEM 112L	General Chemistry II Laboratory	2
CHEM 277	Organic Chemistry I	3
CHEM 278	Organic Chemistry I: Lab	1
CHEM 372	Organic Chemistry II	3
MATH 170	Calculus I	4
STAT 251	Statistical Methods	3
or STAT 301	Probability and Statistics	
Select one of the following Senior Experience courses:		2
BIOL 401	Undergraduate Research	
BIOL 405	Practicum in Anatomy Laboratory Teaching	
BIOL 407	Practicum in Biology Laboratory Teaching	
BIOL 408	Practicum in Human Physiology Laboratory Teaching	
BIOL 411	Senior Capstone	
Select one of the following:		3
ENGL 207	Persuasive Writing	
ENGL 208	Personal & Exploratory Writing	
ENGL 317	Technical Writing	
<a href="#">ENGL 318</a>	<a href="#">Science Writing</a>	
Select one of the following:		4
PHYS 111 & 111L	General Physics I and General Physics I Lab	
PHYS 211 & 211L	Engineering Physics I and Laboratory Physics I	
Select one of the following:		4
PHYS 112 & 112L	General Physics II and General Physics II Lab	
PHYS 212 & 212L	Engineering Physics II and Laboratory Physics II	
Select 15 credits of Approved Electives from the following: <sup>1</sup>		15
BIOL 432	Immunology	
BIOL 433	Pathogenic Microbiology	
BIOL 447	Virology	
BIOL 444	Genomics	
BIOL 482	Protein Structure and Function	
BIOL 485	Prokaryotic Molecular Biology	

BIOL 487	Eukaryotic Molecular Genetics	
<a href="#">ENT 411</a>	<a href="#">Veterinary and Medical Entomology</a>	
<a href="#">ENT 476</a>	<a href="#">Medical Parasitology</a>	
FS 416	Food Microbiology	
FS 417	Food Microbiology Laboratory	
MATH 437	Mathematical Biology	
PLSC 476	Cell Biology	
PLSC 488	Genetic Engineering	
SOIL 425	Microbial Ecology	
<a href="#">PHIL 361</a>	<a href="#">Professional Ethics</a>	
<a href="#">or PHIL 450</a>	<a href="#">Ethics in Science</a>	
Total Hours		78-96

### Courses to total 120 credits for this degree

<sup>1</sup> Additional classes can be substituted with prior approval from advisor and chairperson.

**Rationale:** Three areas of the curriculum are to be changed. One is a simple addition of one course to the allowed writing courses. The other is the addition of courses to the list of approved electives listed at the end of the curriculum posting in the catalog. This minor adjustment of adding two choices to an elective list will not impact the learning outcomes or the assessment plan for the degree.

ENT 411, ENT 476 are appropriate courses for electives in this major, as are PHIL 361 and PHIL 450. NOTE: The intent here is that "PHIL 361 or PHIL 450" is a single item in this list – that is, students may use at most one of these courses towards the degree. (The same as with STAT 251 / STAT 301 already in the list.)

ENGL 318 is very appropriate for the writing requirement in this degree.

### Department of Geography

1. Add the following courses:

#### **GEOG 317 Tree Rings and Environmental Change**

##### **3 credits**

Joint-listed with GEOG 517

Principles, techniques, and interpretation in tree-ring science. Applications in climate, ecology, forestry, and earth sciences. The course objectives are [1] to become proficient with the field and laboratory skills commonly used in tree-ring research, [2] to develop an understanding of the diversity of the applications of tree-ring science, and [3] to apply the techniques and knowledge

learned in the course in addressing a specific topic of interest within the broad realm of geographic research. Additional work required to receive graduate credit.

**Rationale:** This course is the research focus of a relatively new faculty member and will fill needs in our department, our Climate Change Certificate, as well as serving as an elective for students in interdisciplinary programs and other disciplinary programs, such as CNR. It does not add to the workload for the department because it is replacing other courses that have gone dormant recently because of changes in faculty expertise. It is in the teaching rotation of our new faculty member, who is teaching it in Fall 2019 as Geog 404.

### **GEOG 414 Socioeconomic Applications of GIS**

#### **3 credits**

This course explores the use of geographic information systems (GIS) in various socioeconomic research fields including but not limited to urban planning, transportation, public health, environmental justice, crime analysis, and retail/business location etc. A major goal of this course is to teach students how to integrate geographical information techniques and data analytics with their future or ongoing research and real-world applications in the fields of social sciences. The course will be a combination of lectures and labs. The basic concepts, methodologies, and theories will be introduced in the lecture, and the lab sections are designed to give students hands-on experience using ArcGIS to complete a series of real-world projects.

**Prereq:** GEOG 385 or equivalent.

**Rationale:** The new course will strengthen the course offering through the GIS certificate and the forthcoming Geography minor at the Geography Department. The addition is mainly for two reasons: 1) to fill the gap in current GIS related courses at UI, which are more focused on biophysical, environmental, landscape and resource applications; 2) to provide additional elective courses for students who are pursuing the GIS certificate or the Geography minor especially those from social-science disciplines such as sociology, international studies, business and economics, education and human health, sustainable food systems, and political science, etc. No additional developmental workload will be added when this course is offered.

### **GEOG 487 (s) Topics in Geospatial Analysis**

#### **3 credits**

Joint-listed with GEOG 587

Current topics and applications in remote sensing, GIS, and/or spatial analysis. Topics to vary by instructor and current trends in the field. Recommended preparation: At least 2 courses in GIS and/or 1 in remote sensing, depending on topic. Contact instructor in a given semester. Additional course project required for graduate credit.

**Rationale:** On a separate form, we have modified the existing Geog 587 course in order to broaden the topic areas from remote sensing to other types of geospatial analysis. This is for two reasons: a) to offer more variety for our students and b) our course rotation better

supports our offering it by different instructors (with different specialty areas) over time. We request this course to be created as the joint-listed undergraduate companion course in order to make this opportunity available to qualified undergraduate students. We are deleting courses that we no longer teach in the GIS arena, such as Geog J486/586 Transportation GIS due to current faculty interest/expertise.

### **GEOG 517 Tree Rings and Environmental Change**

#### **3 credits**

Joint-listed with GEOG 317

Principles, techniques, and interpretation in tree-ring science. Applications in climate, ecology, forestry, and earth sciences. The course objectives are [1] to become proficient with the field and laboratory skills commonly used in tree-ring research, [2] to develop an understanding of the diversity of the applications of tree-ring science, and [3] to apply the techniques and knowledge learned in the course in addressing a specific topic of interest within the broad realm of geographic research. Additional work required to receive graduate credit.

**Rationale:** This course is the research focus of a relatively new faculty member and will fill needs in our department, our Climate Change Certificate, as well as serving as an elective for students in interdisciplinary programs and other disciplinary programs, such as CNR. It does not add to the workload for the department because it is replacing other courses that have gone dormant recently because of changes in faculty expertise. It is in the teaching rotation of our new faculty member, who is teaching it in Fall 2019 as Geog 404.

## 2. Change the following courses:

### **GEOG 407 Spatial ~~Statistics~~ Analysis and Modeling**

#### **3 credits**

Joint-listed with GEOG 507

Introduces the basic theories and methods of spatial analysis used for statistical modeling and problem solving in human and physical geography. The special nature of spatial data (point, continuous, and lattice) in the social and physical sciences is emphasized. Topics include point pattern analysis, spatial autocorrelation analysis, spatial multivariate regression, local indicators of spatial association, and geographically weighted regression. Extra oral and/or written assignments required for grad credit. Cooperative: open to WSU degree-seeking students.

**Prereq:** STAT 431 or permission.

**Rationale:** Proposed changed to title is better aligned with course material and consistent with similar courses at other universities.

### **GEOG 507 Spatial ~~Statistics~~ Analysis and Modeling**

#### **3 credits**

Joint-listed with GEOG 407

Introduces the basic theories and methods of spatial analysis used for statistical modeling and problem solving in human and physical geography. The special nature of spatial data (point, continuous, and lattice) in the social and physical sciences is emphasized. Topics include point pattern analysis, spatial autocorrelation analysis, spatial multivariate regression, local indicators of spatial association, and geographically weighted regression. Extra oral and/or written assignments required for grad credit. Cooperative: open to WSU degree-seeking students.

**Prereq:** STAT 431 or permission.

**Rationale:** Proposed changed to title is better aligned with course material and consistent with similar courses at other universities. This course emphasizes analysis and application.

3. Reactivate and change the following course:

**GEOG 587 (s) ~~Advanced Topics in Remote Sensing~~ Geospatial Analysis**

**3 credit**

Joint-listed with GEOG 487

Current topics and applications in remote sensing, GIS, and/or spatial analysis. Topics to vary by instructor and current trends in the field. ~~literature including radar, thermal and hyperspectral remote sensing, sensor advances, airborne platforms, advanced classification and segregation techniques, large area pattern analysis, time series and trends, and advances in both terrestrial and non-terrestrial approaches, models and applications.~~ Recommended preparation: At least 2 courses in GIS and/or 1 in remote sensing, depending on topic. Contact instructor in a given semester. Additional course project required for graduate credit.

**Rationale:** This course is currently on the dormant list. We request that it be reinstated to active status with the changes above.

We are broadening the topics this course can cover from only remote sensing to other types of geospatial analysis. This is for two reasons: a) to offer more variety for our students and b) our course rotation better supports our offering it by different instructors (with different specialty areas) over time.

4. Make the following curricular changes to the **B.S. in Geography:**

### **Geography (B.S.)**

This program is offered through the College of Science. Required course work includes the university requirements (see regulation J-3) and:

*Note: Students must earn a grade of "C" or better in all Geography courses.*

or ENGL 317	Technical Writing	
GEOG 100	Physical Geography	3
GEOG 100L	Physical Geography Lab	1
GEOG 165	Human Geography	3
GEOG 200	World Regional Geography	3
GEOG 313	Global Climate Change	3
GEOG 385	GIS Primer	3
GEOG 390	Cartographic Design & Geovisualization	3
<del>GEOG 489</del>	<del>Capstone Preparation</del>	<del>1</del>
GEOG 493	Senior Capstone in Geography	3
STAT 251	Statistical Methods	3
Select one of the following:		3-4
MATH 143	College Algebra	
MATH 160	Survey of Calculus	
MATH 170	Calculus I	
MATH 175	Calculus II	
Select 3 credits from the following in human geography:		3
<a href="#">GEOG 260</a>	<a href="#">Geopolitics</a>	
GEOG 330	Urban Geography	
<del>GEOG 340</del>	<del>Business Location Decisions</del>	
GEOG 345	Global Economic Geography	
GEOG 350	Geography of Development	
GEOG 360	Population Dynamics and Distribution	
GEOG 365	Political Geography	
Select 3 credits from the following in physical geography:		3
GEOG 301	Meteorology	
<a href="#">GEOG 315</a>	<a href="#">Tree Rings and Environmental Change</a>	
GEOG 401	Climatology	
GEOG 410	Biogeography	
GEOG 430	Climate Change Ecology	
Select one course from the following in human-environment interactions:		3
<del>GEOG 411</del>	<del>Natural Hazards and Society</del>	
GEOG 420	Land, Resources, and Environment	
GEOG 435	Climate Change Mitigation	
GEOG 455	Societal Resilience and Adaptation to Climate Change	
<a href="#">GEOG 488</a>	<a href="#">Geography of Energy Systems</a>	

Select 6 additional credits in Geography courses, for a total minimum number of 36 credits in Geography 6

Total Hours ~~47-48~~46-47

**Courses to total 120 credits for this degree**

Students interested in obtaining more depth in any of the departmental focus areas (Geographic Information Science (GIS), spatial analysis, physical science and the environment, regional/global development) are encouraged to discuss with their advisor recommended courses in Geography and other departments appropriate to those depth areas.

**Rationale:** The relative minor curriculum adjustments here do not impact the learning outcomes or assessment plan for the degree. The requested changes follow recent curriculum additions and deletions. With recent changes in faculty constituency, new courses have been developed and are now added to the curriculum and older courses no longer offered have been removed from the list.

5. Make the following curricular changes to the **Undergraduate Academic Certificate in Climate Change**:

**Climate Change Undergraduate Academic Certificate**

GEOG 313/513 Global Climate Change 3

Select three courses from the following: 9

GEOG 401 Climatology

~~GEOG 411 Natural Hazards and Society~~

GEOG 430 Climate Change Ecology

GEOG 435/535 Climate Change Mitigation

GEOG 455 Societal Resilience and Adaptation to Climate Change

GEOG 488 Geography of Energy Systems

SOC 466 Climate Change and Society

GEOG 317/517 Tree Rings and Environmental Change

GEOG 435/535 Glaciology and the Dynamic Frozen Earth

~~Seminar courses as approved by the department~~

Total Hours 12

**Courses to total 12 credits for this certificate**

Optional recommendation for selection of electives:

In selecting 3 electives from the above list, it is not required that students choose a particular track, and none is designated on the student's transcript. However, to assist students in course selection,



[the department has developed some recommendations for specific electives students may want to pursue, if they have specific interests or career objectives.](#)

*[For Breadth in all aspects of Climate Change \(both Human and Natural Systems\) – recommended electives:](#)*

Several of the above courses are focused primarily on some aspect of climate change, and the department recommends that students consider these courses when selecting electives to obtain knowledge across the range of topics of climate change, including climate science, impacts, adaptation, and mitigation:

- [Geog 401 Climatology](#)
- [Geog 430 Climate Change Ecology](#)
- [Geog 435/535 Climate Change Mitigation](#)
- [Geog 455 Societal Resilience and Adaptation to Climate Change](#)
- [Soc 466 Climate Change and Society](#)

*[For Emphasis on Climate Change and Energy/Society – recommended electives:](#)*

- [Geog 488 Geography of Energy Systems](#)
- [Geog 435/535 Climate Change Mitigation](#)
- [Geog 455 Societal Resilience and Adaptation to Climate Change](#)
- [Soc 466 Climate Change and Society](#)

*[For Emphasis on Climate Change and Biophysical Impacts – recommended electives:](#)*

- [Geog 401 Climatology](#)
- [Geog 430 Climate Change Ecology or Geog 410 Biogeography](#)
- [Geog 317/517 Tree Rings and Environmental Change](#)
- [Geol 435/535 Glaciology](#)

**Rationale:** The reason for the changes in the climate change certificate are motivated by faculty changes that limit our ability to present some older courses (e.g., Natural Hazards and Society) and the addition of some new courses (e.g., Tree Rings and Environmental Change) and an expansion of options to students by including two courses from outside the department among our electives. Because the list of elective courses has been expanded, the department also desires to insert some (optional, not required) recommendations for students to guide their choices of electives based on their interests and future career goals, if they so desire. There is no additional workload resulting from these changes, as the courses listed are in the regular rotation of faculty members.

6. Make the following curricular changes to the **Undergraduate Academic Certificate in Geographic Information Systems**:

### **Geographic Information Systems Undergraduate Academic Certificate**

GEOG 385	GIS Primer	3
GEOG 475	Intermediate GIS	3
Select 9 credits of electives from the following: <a href="#">(See note below about limits to the total number of credits allowed from outside the Department of Geography.)</a>		9

GEOG 390	Cartographic Design & Geovisualization
<a href="#">GEOG 402</a>	<a href="#">GIS Skills Development</a>
GEOG 407/507	Spatial <del>Statistics</del> <a href="#">Analysis</a> and Modeling
<a href="#">GEOG 414</a>	<a href="#">Socioeconomic Apps in GIS</a>
GEOG 424/524	Hydrologic Applications of GIS and Remote Sensing
GEOG 483/583	Remote Sensing/GIS Integration
GEOG 479	GIS Programming
<a href="#">GEOG 487/587</a>	<a href="#">Topics in Geospatial Analysis</a>
<a href="#">FOR/NRS 375</a>	<a href="#">Intro to Spatial Analysis for Natural Resources</a>
<a href="#">LARC 395</a>	<a href="#">GIS Applications in Land Planning 1</a>
<a href="#">REM 407</a>	<a href="#">GIS Applications in Fire Ecology and Management</a>
<a href="#">Other courses as approved by the department</a>	

*Note: A grade of 'C' or higher is required in all coursework for this academic certificate. [Nine of the 15 credits must be taken within the Department of Geography at the University of Idaho. Only 6 credits may be taken outside of the department, including courses taken in other departments at UI and transfer courses from other institutions used as substitutions.](#)*

### **Courses to total 15 credits for this certificate**

**Rationale:** The department has been offering the GIS Certificate for approximately 15 years. The changes here represent updates to reflect current courses offered both in our department and others, and to broaden the number of credit hours allowed from outside the department from 3 to 6. These changes do not add to the existing department workload.

### **Department of Geological Sciences**

1. Reactivate and change the following courses:

#### **GEOL 360 Geologic Hazards**

##### **3 credits**

Survey of natural geologic hazards, their controlling factors, recognition of hazard potential; emphasis on flash floods, earthquakes, landslides, volcanic [eruptions, tsunamis, hazards, subsidence](#). ~~Three 1-day field trips.~~

**Prereq:** GEOL 101 or GEOL 111 [or GEOG 100 or ENVS 101 or Permission](#)

**Rationale:** This change would return a formerly popular course to Geology's offerings. The previous course was dropped after its regular instructor retired. Note: This course is dormant – the request would restore it to active status. The only change from the old dormant listing is in the prerequisites (with GEOG 100 and ENVS 101 added as allowable prereq choices).

Geologic hazards are one of the most significant and dramatic ways in which humans and human society are affected by geology. They frequently damage infrastructure, disrupt activities, block transportation, and cause injury and death. Understanding these hazards and their associated risks is critical to many fields of geology, engineering, environmental science, and urban planning. It is also important knowledge for any people residing in geologically active regions (such as most of the western US) whose lives may be unexpectedly affected by geologic events. The department currently has capacity among existing faculty to offer this course.

### **GEOL 448 Tectonics**

#### **3 credits**

Joint-listed with GEOL 548

~~Fundamentals of global plate tectonics, evolution of ocean basins, and the development of continental orogenic belts; focus on theoretical aspects of global tectonics, the salient physical constraints leading to the paradigm, and practical application of the model to regional geological problems. Graduate credit requires additional work including independent research, presentation of the research results in a class presentation, writing a research paper, and answering an additional question in examinations. Two lec and 2 hrs of lab a wk; one or two 1- to 2-day field trips.~~

An investigation of the processes driving the physical evolution of the Earth's crust and mantle and how those processes are reflected at the surface. Discussion of the development of mountain belts, growth of continents and ocean basins, and plate boundary dynamics. A more advanced project/paper will be required for graduate-level credit. One or two 1-2 day field trips. Cooperative: open to WSU degree-seeking students.

**Prereq:** GEOL 345 or Permission

**Rationale:** We propose to revive a set of graduate and undergraduate courses (Geol 448/548) that have been on the dormant list and to offer the courses jointly.

The proposed courses were previously taught by faculty who later left the department, which is why it has not been offered in >5 years and was shifted to dormant status. New faculty wish to return this important course to the roster. It will be included in the regular teaching load of those new faculty.

There is demand for this course among WSU graduate students as well as UI students and therefore we request its cooperative status be continued.

### **GEOL 471 Ore Deposits and Exploration**

#### **3 credits**

The geologic origin of metallic ore deposits, and the methods used to search for them. Taught in alternating years. ~~3-hr lec per week.~~ One one-day and one three-day field trips.

**Prereq:** GEOL 249 and MATH 143 with a grade of 'C' or better .

**Rationale:** This change would return a formerly popular course to Geology's offerings. The previous course was dropped after its regular instructor retired. Students regularly request that

it be returned to the course rotation. The department currently has capacity among existing faculty to offer this course.

### **GEOL 548 Tectonics**

#### **3 credits**

Joint-listed with GEOL 448

~~Fundamentals of global plate tectonics, evolution of ocean basins, and the development of continental orogenic belts; focus on theoretical aspects of global tectonics, the salient physical constraints leading to the paradigm, and practical application of the model to regional geological problems. Graduate credit requires additional work including independent research, presentation of the research results in a class presentation, writing a research paper, and answering an additional question in examinations. Two lec and 2 hrs of lab a wk; one or two 1-2 day field trips.~~

An investigation of the processes driving the physical evolution of the Earth's crust and mantle and how those processes are reflected at the surface. Discussion of the development of mountain belts, growth of continents and ocean basins, and plate boundary dynamics. A more advanced project/paper will be required for graduate-level credit. 3 hrs lec/wk, One or two 1-2 day field trips.  
Cooperative: open to WSU degree-seeking students.

Prereq: Geol 345 or Permission

**Rationale:** We propose to revive a set of graduate and undergraduate courses (Geol 448/548) that have been on the dormant list and to offer the courses jointly.

The proposed course was previously taught by faculty who later left the department, which is why it has not been offered in >5 years and was shifted to dormant status. New faculty wish to return this important course to the roster. It will be included in the regular teaching load of those new faculty.

There is demand for this course among WSU graduate students as well as UI students and therefore we request its cooperative status be continued.

## 2. Change the following courses:

### **GEOL 212 Principles of Paleontology**

#### **4 credits**

Studies of morphology, classification of fossil groups, and utility of fossils in interpreting depositional environments and ages of sedimentary rocks. ~~Three lec and one 2-hr lab a wk; o~~ One 12- to 24- day field trip. Recommended Preparation: GEOL 102.

**Rationale:** Most appropriate field sites for paleontological study are a multi-hour drive away and require a field trip length of 2-4 days in order for the trip to be pedagogically meaningful. This has been department practice for many years, but is not consistent with the current catalog description. We are requesting this change so that the catalog information is correct.

### **GEOL 344 Earthquakes ~~and Seismic Hazards~~**

**3 credits**

The geology of earthquakes including the cause of fault rupture, seismic waves, focal mechanisms, and earthquakes associated with all fault types in a variety of tectonic settings; methods of identifying paleo-earthquakes in the geologic record, and the assessment of seismic ~~hazard and~~ risk in active fault environments. ~~One 3-day field trip.~~

**Prereq:** GEOL 101/GEOL 101L or GEOL 111/GEOL 111L [or GEOG 100 or ENVS 101](#); and MATH 143 with a grade of 'C' or better.

**Distance Availability:** Yes

**Rationale:** The department is updating its course offerings in the fields of environmental geology and geological hazards to better fit modern usage of these terms. To avoid student confusion with the new course GEOL 360 Geologic Hazards, it is desired to remove the words "hazards" from the title and description of GEOL 344. The content of GEOL 344 will not be changed.

GEOL 344 is offered online as well as on campus, making the logistics of a three day field trip impossible. The course has not in fact included a field trip in its last three offerings.

This change does not affect the capacity among existing faculty to offer this course.

**GEOL 361 Geology and the Environment****3 credits**

Environmental consequences of development of geologic resources; including issues of waste disposal, pollution and human health, [and climate change](#); ~~natural hazards and their impact on humans and the environment.~~ ~~Two 1-day field trips.~~

**Prereq:** GEOL 101/GEOL 101L or GEOL 111/GEOL 111L [or GEOG 100 or ENVS 101](#); and MATH 143 with a grade of 'C' or better .

**Rationale:** The department is returning its old Geologic Hazards course from dormant status and we are therefore removing the geologic hazards component from this course. This change will allow for considerably more in-depth exploration of environmental geology, including the important emerging topic of global climate change.

No change in workload will be associated with this course change.

**Department of Mathematics**

1. Add the following course:

**MATH 153 Introduction to Statistical Reasoning****3 credits**

Cross-listed with STAT 153

A course in statistical literacy, an introduction with emphasis on examples and case studies. Topics include data sources and the distinction between experiments, observational studies, and surveys,

graphical and numerical description of data, understanding randomness, central tendency, correlation versus causation, line of best fit, estimation of proportions, and statistical testing.

**Rationale:** Our current introductory statistics courses, Stat 251 and Stat 301, are oriented toward training students to perform statistical analyses. This course is intended to train students to understand statistical analyses and gain critical thinking skills about data and research, but mainly as consumers of information rather than as data analysts.

Statistical thinking, relevant ideas, themes, and concepts are emphasized over mathematical calculation. In this class, students learn many of the elementary principles that underlie collecting data, organizing it, summarizing it, and drawing conclusions from it.

This course is partly in response to a State Board of Education request to create an introductory statistics course with fewer prerequisites than our existing courses. This course will be similar to the old course Stat 150 which several of our faculty have taught previously. We intend to cross list this course with the new STAT 153, at the request of the SBOE.

2. Change the following course:

**MATH 510 Seminar on College Teaching of Mathematics**

**1 credit, [max arranged](#)**

Development of skills in the teaching of college mathematics; includes structure of class time, test construction, and various methods of teaching mathematics; supervision of teaching assistants in their beginning teaching assignments. Graded P/F.

**Prereq:** Permission.

**Rationale:** The purpose of this course is to help our graduate students develop skill in the teaching of college mathematics. Thus, the graduate students, who are teaching assistants, are required to attend this seminar every fall semester. The course contents vary as the teaching environment (such as the development of new teaching methods, the integration of technology, and the application of new teaching regulations) changes. The students should, therefore, be able to earn credit every time they take the course. We request to make the course repeatable (1 credit per occurrence).

**Department of Physics**

1. Change the following course:

**PHYS 490 Research**

**~~10~~-6 credits, max 6**

Undergraduate research or thesis.

**Prereq:** Permission of Instructor.

**Rationale:** To allow a zero credit option for students who wish to volunteer as undergraduate researchers (without pay or credit). There is no added workload for the department.

## Department of Statistical Science

1. Add the following course:

### **STAT 153 Introduction to Statistical Reasoning**

#### **3 credits**

Cross-listed with MATH 153

A course in statistical literacy, an introduction with emphasis on examples and case studies. Topics include data sources and the distinction between experiments, observational studies, and surveys, graphical and numerical description of data, understanding randomness, central tendency, correlation versus causation, line of best fit, estimation of proportions, and statistical testing.

**Rationale:** Our current introductory statistics courses, Stat 251 and Stat 301, are oriented toward training students to perform statistical analyses. This course is intended to train students to understand statistical analyses and gain critical thinking skills about data and research, but mainly as consumers of information rather than as data analysts.

Statistical thinking, relevant ideas, themes, and concepts are emphasized over mathematical calculation. In this class, students learn many of the elementary principles that underlie collecting data, organizing it, summarizing it, and drawing conclusions from it.

This course is partly in response to a State Board of Education request to create an introductory statistics course with fewer prerequisites than our existing courses. This course will be similar to Stat 150 which several of our faculty have taught previously. We intend to cross list this course with the Mathematics Department as Math 153, at the request of the SBOE.

2. Make the following curricular changes to the **B.S. in Statistics**:

### **Statistics (B.S.)**

Required course work includes the university requirements (see regulation J-3) and:

MATH 170	Calculus I	4
MATH 175	Calculus II	4
MATH 275	Calculus III	3
MATH 330	Linear Algebra	3
Select one of the following options:		39-58
General		
Actuarial Science and Finance		
Total Hours		53-72

**A. General Option**

STAT 301	Probability and Statistics	3
STAT 407	Experimental Design	3
STAT 422	Sample Survey Methods	3
STAT 431	Statistical Analysis	3
STAT 436	Applied Regression Modeling	3
STAT 451	Probability Theory	3
STAT 452	Mathematical Statistics	3
Select two of the following:		6
CS 120	Computer Science I	
STAT 426	SAS Programming	
STAT 427	R Programming	
Other approved courses		
Select 12 credits from the following:		12
CS 479	Data Science	
MATH 310	Ordinary Differential Equations	
MATH 428	Numerical Methods	
MATH 437	Mathematical Biology	
MATH 438	Mathematical Modeling	
MATH 471	Introduction to Analysis I	
MIS 455	Data Management for Big Data	
STAT 456	Quality Management	
STAT 514	Nonparametric Statistics	
STAT 517	Statistical Learning and Predictive Modeling	
STAT 535	Introduction to Bayesian Statistics	
Total Hours		39

**Courses to total 120 Credits for this degree****B. Actuarial Science and Finance Option**

Math Courses		
MATH 310	Ordinary Differential Equations	3
MATH 451	Probability Theory	3
MATH 452	Mathematical Statistics	3
400-Level Math Courses:		9
Three additional courses chosen from Math courses numbered 400 and above. May include Stat 422.		
Supporting Courses		12



ACCT 201	Introduction to Financial Accounting	
ACCT 202	Introduction to Managerial Accounting	
FIN 301	Financial Resources Management	
STAT 431	Statistical Analysis	
BUS 339	Spreadsheet Modeling	1-3
or STAT 426	SAS Programming	
CS 112	Computational Thinking and Problem Solving	3-4
or CS 120	Computer Science I	
STAT 251	Statistical Methods	3
or STAT 301	Probability and Statistics	
STAT 433	Econometrics	3
or <del>STAT 550</del>	<del>Regression</del>	
<a href="#">Or STAT 436</a>	<a href="#">Applied Regression Modeling</a>	
Select one of the following:		4-6
ECON 201	Principles of Macroeconomics	
& ECON 202	and Principles of Microeconomics	
ECON 272	Foundations of Economic Analysis	
Select three courses selected from the following:		7-9
ECON 351	Intermediate Macroeconomic Analysis	
ECON 352	Intermediate Microeconomic Analysis	
FIN 302	Intermediate Financial Management	
FIN 381	International Finance	
FIN 408	Security Analysis	
FIN 463	Portfolio Management	
FIN 464	Derivatives and Risk Management	
FIN 465	Introduction to Market Trading	
FIN 469	Risk and Insurance	
MATH 455	Applied Actuarial Science	
<a href="#">STAT 419, 426 or 427</a>	<a href="#">Introduction to SAS/R Programming, SAS Programming, or R Programming</a>	
Total Hours		51-58
<b>Courses to total 120 credits for this degree</b>		

**Rationale:** STAT 436 was decided to be a more appropriate course for undergraduate students. One of STAT 419, 426 and 427 should be added to the list of elective courses as a choice as they are appropriate courses for the degree. The intent of the catalog language is that at most one of these can be counted towards the required electives.

This minor adjustment in the degree curriculum will not alter the learning outcomes or assessment plan.

3. Make the following curricular changes to the **Minor in Statistics**:

### Statistics Minor

STAT 422	Sample Survey Methods	3
STAT 431	Statistical Analysis	3
MATH 160	Survey of Calculus	4
or MATH 170	Calculus I	
STAT 251	Statistical Methods	3
or STAT 301	Probability and Statistics	
Select three courses from the following:		9
MKTG 421	Marketing Research & Analysis	
MATH 330	Linear Algebra	
MATH 451	Probability Theory	
MATH 452	Mathematical Statistics	
<a href="#"><u>STAT 419, 426, or 427</u></a>	<a href="#"><u>Introduction to SAS/R Programming, SAS Programming, or R Programming</u></a>	
STAT 433	Econometrics	
STAT 456	Quality Management	
STAT 514	Nonparametric Statistics	
STAT 519	Multivariate Analysis	
Total Hours		22

#### Courses to total 22 credits for this minor

**Distance Availability:** Yes, via Engineering Outreach

**Rationale:** This minor addition to the curriculum of the minor will not alter the assessment plan. The rationale for the change is that these courses (STAT 419, 426 and 427) are appropriate to the minor. Note that the intent of the requested catalog language is that at most one of these three can be counted towards the elective credits for the minor.