COLLEGE OF NATURAL RESOURCES
Proposed Catalog Changes

Effective Term (unless otherwise noted) = Summer 2015

Conservation Social Sciences

1. Add the following course:

   CSS 574  Environmental Politics and Policy (3 cr)
   Political and institutional context for the formulation, implementation, and evaluation of U.S. environmental policy.

   Recommended Short Course Title: Env Politics & Policy

   Rationale: A version of the course is offered currently as a CSS 504, and serves the MNR and another CNR graduate programs. In addition, it has consistent enrollment from students across the University. This new course (574), with a name currently in catalogue, will be consistent with POLS 564, which has been dormant for several years. This new joint listed course number will better serve existing target audience in CNR, add will also better serve students in the POLS MPA program.

Fish and Wildlife Sciences

1. Add the following courses:

   Fish 202  Fish & Wildlife Applications II (1 cr)
   This two semester sequence (WLF201, Fish 202) of courses will introduce students to research questions and methods in fish and wildlife sciences, the culture and organization of potential state, federal and tribal employers and management challenges for fish and wildlife. The course will include an experiential learning field trip.

   Prereq: NR 101 or Permission

   Recommended Short Course Title: None Provided. Editor recommends: Fish&Wildlife Applications II

   Rationale: During senior focus group assessment meetings, students indicated the need for 1) a course in their major during the sophomore year, 2) more contact with agencies and potential employers, and 3) more experiential learning opportunities. Adding this course addresses these concerns. The course will be taught by existing faculty on a rotational basis with agency partners participating in the class exercises and field trips.

   WLF 105  Hunter Education (2 cr)
   The course provides an overview of hunter ethics; wildlife management, conservation, and survival; and wildlife laws and law enforcement. This course also fulfills the state requirement for hunter education for purchase of a hunting license. Course includes in-class instruction and one outdoor field day. Graded Pass/Fail.

   Rationale: This course provides a valuable addition to students pursuing degrees in natural resource management, and it will be of interest to other students across the University interested in hunting and wildlife harvest management. The course also provides a unique training in hunting ethics and practices, which is required for obtaining a hunting license in Idaho. The course will be taught by a hunter education specialist certified by Idaho Fish and Game and does not add to faculty workloads.

   WLF 201  Fish and Wildlife Applications I (1 cr)
   This two semester sequence (WLF201, Fish 202) of courses will introduce students to research questions and methods in fish and wildlife sciences, the culture and organization of potential state, federal and tribal employers, and management challenges for fish and wildlife populations and habitats. The course will include an experiential learning field trip.

   Prereq: NR 101 or Permission

   Recommended Short Course Title: None Provided. Editor recommends: Fish&Wildlife Applications I

   Rationale: During senior focus group assessment meetings, students indicated the need for 1) a course in their major during the sophomore year, 2) more contact with agencies and potential employers, and 3) more experiential learning opportunities. Adding this course addresses these concerns. The course will be taught by existing faculty on a rotational basis with agency partners participating in the class exercises and field trips.

   WLF 205  Wildlife Law Enforcement (2 cr)
   This course will provide students with an introduction to the history of wildlife laws and the role of a Conservation Officer. It will also provide students with a better understanding of wildlife crimes and the impact they have on fish and wildlife. This course is designed for students seeking a career in wildlife law enforcement as well as those pursuing a career in wildlife/fisheries/habitat management.
Rationale: This course was piloted as a 1-credit special topics course in spring 2014 (WLF204). Enrollment was capped at 25 and the course filled with people on the waitlist. We had very positive feedback from students and requests to offer this as an expanded 2 credit course. We train many students for a career as a conservation officer, so this course is a great addition to our class options. The course will be taught by a Conservation Officer from Idaho Fish and Game (who also taught the pilot course in 2014), and consequently, it does not add to faculty workloads.

2. Change the following course:

**WLF 540 Conservation Genetics (1-3 cr)**

_Same as For 540._ Basic principles of population genetics and phylogenetics and their applications to the field of conservation genetics and natural resource management. Taught in three 1-credit modules, and students can register for 1-3 credits. Module 1 includes introduction to conservation genetics and phylogenetics, Module 2 includes population genetic theory and methods, and Module 3 includes applications in conservation genetics and genomics. Case studies and examples from current literature; topics include genetic diversity, inbreeding, population structure, gene flow, genetic drift, molecular phylogenetics, and hybridization. (Fall/Spring, Alt/yr/s)

Rationale: Course is being redesigned in a modular format to give students the option of taking it for 1-3 credits. Many students are interested in the topic, but not all can fit the full 3-credit class into their schedule and some graduate students have to leave early during spring semester for field work. This change was requested by graduate students during an assessment focal group meeting. Co-instructor for For540 is no longer teaching the class, hence, the cross-listing is being dropped. Moving this course to spring provides a better balance for the FWS instructor’s teaching load.

3. Change the curricular requirements of **Fishery Resources (B.S.Fish.Res.)**: Students pursuing a B.S. degree in fishery resources (management or aquaculture emphasis) must have received a grade of C or better in each of the following four indicator courses to register for fish- and wildlife-prefixed upper-division courses and to graduate with a B.S.Fish.Res.: Biol 116 and 213, Stat 251, and For 221. To graduate, students must achieve a grade of C or better in Biol 481, and each fish- and wildlife-prefixed upper-division course listed in the requirements for the B.S. degree in fishery resources. Required course work includes the university requirements (see regulation J-3) and:

**First and Second Years**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biol 115</td>
<td>Cells and the Evolution of Life (4 cr)</td>
</tr>
<tr>
<td>Biol 116</td>
<td>Organisms &amp; Environments (4 cr)</td>
</tr>
<tr>
<td>Biol 213</td>
<td>Principles of biological Structure and Function (4 cr)</td>
</tr>
<tr>
<td>Chem 101</td>
<td>Introduction to Chemistry I (4 cr)</td>
</tr>
<tr>
<td>Comm 101</td>
<td>Fundamentals of Public Speaking (2 cr)</td>
</tr>
<tr>
<td>Econ 202</td>
<td>Principles of Microeconomics (3 cr)</td>
</tr>
<tr>
<td>Fish 102</td>
<td>The Fish and Wildlife Professions (1 cr)</td>
</tr>
<tr>
<td>For 202</td>
<td>Fish &amp; Wildlife Applications I (1 cr)</td>
</tr>
<tr>
<td>CSS 235</td>
<td>Society and Natural Resources (3 cr)</td>
</tr>
</tbody>
</table>

**One of the following (3 cr):**

Chem 275 | Carbon Compounds (3 cr)
Chem 277 | Organic Chemistry (3 cr)

**One of the following (3 cr):**

For 221 | Ecology (3 cr)
REM 221 | Ecology (3 cr)

**One of the following (4 cr):**

Geol 101, | Physical Geology and Lab (4 cr)
Geol 101L|
Soil 205, Soil 206 | The Soil Ecosystem and Lab (4 cr)

**One of the following (4 cr):**

Phys 100, | Fundamentals of Physics and Lab (4 cr)
Phys 100L |
Phys 111, | General Physics I and Lab (4 cr)
Phys 111L |

**Third and Fourth Years**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biol 250, Biol 255</td>
<td>General Microbiology and Lab (5 cr)</td>
</tr>
<tr>
<td>Biol 481</td>
<td>Ichthyology (4 cr)</td>
</tr>
<tr>
<td>CSS 383</td>
<td>Natural Resource and Ecosystem Service Economics (3 cr)</td>
</tr>
</tbody>
</table>
Fish 314  Fish Ecology (3 cr)
Fish 315  Fish Ecology Lab (1 cr)
Fish 316  Principles of Population Dynamics (2 cr)
Fish 415  Limnology (4 cr)
Fish 418  Fisheries Management (4 cr)
Fish 495  Seminar (1 cr)
For 375  Introduction to Spatial Analysis for Natural Resource Management (3 cr)
WLF 448  Fish and Wildlife Population Ecology (4 cr)

Approved work experience in major field required

One of the following (3 cr):
AVS 371  Anatomy and Physiology (3 cr)
Biol 423  Comparative Vertebrate Physiology (3 cr)

One of the following (3 cr):
Engl 313  Business Writing (3 cr)
Engl 317  Technical Writing (3 cr)

One of the following (3-4 cr):
Fish 422  Concepts in Aquaculture (3 cr)
Fish 424  Fish Health Management (4 cr)

One of the following (3-4 cr):
Biol 310, Biol 315  Genetics and Lab (4 cr)
Gene 314  General Genetics (3 cr)

Courses to total 120 credits for this degree

Rationale: During senior focus group assessment meetings, students indicated the need for a course in their major during the sophomore year and more experiential learning opportunities. Adding these two Fall/Spring 1-credits courses addresses this identified need. These courses can be waived for transfer students, if requested, but they may choose to take these courses. These courses will be open to all university students with an interest in fish and wildlife management, and they do not need to be taken in sequence.

4. Change the curricular requirements of Wildlife Resources (B.S.Wildl.Res.):

Students pursuing a B.S. in wildlife resources must have received a grade of C or better in each of the following four indicator courses to register in fish- and wildlife-prefixed upper-division courses and to graduate with a B.S. in wildlife resources: Biol 116 and 213, Stat 251, and For 221.

To graduate, a student must receive a grade of C or better in each fish- and wildlife-prefixed upper-division course listed in the requirements for the B.S. in wildlife resources.

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

First and Second Years
Biol 115  Cells and the Evolution of Life (4 cr)
Biol 116  Organisms & Environments (4 cr)
Biol 213  Principles of Biological Structure and Function (4 cr)
Chem 101  Introduction to Chemistry I (4 cr)
Comm 101  Fundamentals of Public Speaking (2 cr)
Econ 202  Principles of Microeconomics (3 cr)
Fish 202  Fish & Wildlife Applications II (1 cr)
For 235 cr  Society and Natural Resources (3 cr)
CSS 235  
NR 101  Exploring Natural Resources (1 cr)
Stat 251  Statistical Methods (3 cr)
WLF 102  The Fish and Wildlife Professions (1 cr)
WLF 201  Fish and Wildlife Applications I (1 cr)

One of the following (3 cr):
Chem 275  Carbon Compounds (3 cr)
Chem 277  Organic Chemistry I (3 cr)

One of the following (3 cr):
For 221  Ecology (3 cr)
REM 221  Ecology (3 cr)

One of the following (3-4 cr):
For 320  Dendrology (4 cr)
REM 341  Systematic Botany (3 cr)

One of the following (4 cr):
Geol 101  Physical Geology and Lab (4 cr)
Geol 101L  

Page 3 of 12
Soil 205, Soil 206

One of the following (4 cr):
Math 160  Survey of Calculus (4 cr)
Math 170  Analytic Geometry and Calculus I (4 cr)

Third and Fourth Years
AVS 371  Anatomy and Physiology (3 cr)
CSS 383  Natural Resource and Ecosystem Service Economics (3 cr)
For 375  Introduction to Spatial Analysis for Natural Resource Management (3 cr)
WLF 314, WLF 315  Wildlife Ecology I and Lab (4 cr)
WLF 316  Wildlife Ecology II (4 cr)
WLF 440  Conservation Biology (3 cr)
WLF 448  Fish and Wildlife Population Ecology (4 cr)
WLF 492  Wildlife Management (4 cr)
WLF 495  Wildlife Seminar (1 cr)

One of the following (3-4 cr):
Biol 310, Biol 315  Genetics and Lab (4 cr)
Gene 314  General Genetics (3 cr)

One of the following (4 cr):
Phys 100, Phys 100L  Fundamentals of Physics and Lab (4 cr)
Phys 111, Phys 111L  General Physics I and Lab (4 cr)

One of the following (3 cr):
Comm 431  Applied Business and Professional Communication (3 cr)
Engl 208  Personal and Exploratory Writing (3 cr)
Engl 317  Technical Writing (3 cr)

Restricted electives, choose two courses from the following (must receive a grade of C or better):
Biol 481  Ichthyology (4 cr)
Biol 483  Mammalogy (3 cr)
Biol 489  Herpetology (4 cr)
WLF 482  Ornithology (4 cr)

Approved work experience in major field required

Courses to total 120 credits for this degree

Rationale: During senior focus group assessment meetings, students indicated the need for a course in their major during the sophomore year and more experiential learning opportunities. Adding the two Fall/Spring 1-credits courses (Wlf 201 and Fish 202) addresses this identified need. These courses can be waived for transfer students, if requested, but they may choose to take these courses. These courses will be open to all university students with an interest in fish and wildlife management, and they do not need to be taken in sequence. The addition of Phys100 and 100L to the curriculum is to correct an error in the current on-line catalog, which now lists only Phys111 and 111L in the bin under the heading “One of the following (4 cr)”.

Forest, Rangeland, and Fire Sciences

1. Drop the following courses:

For 540  Conservation Genetics (3 cr)
See WLF 540.

For 556  Phylogenetics Reading Group (1 cr, max arr)
Review recent articles in phylogenetics and systematics journals. Students choose, critically review, and discuss the articles to develop critical-thinking skills and confidence in their knowledge of the literature. Graded P/F.

Rationale: The faculty member who taught this course has moved to the Department of Biological Sciences and it will not be offered again in this department.

2. Add the following courses:

For 210  Winter Harvesting (1 cr)
This is an introduction to chainsaw safety and operation, precision timber falling, and winter harvesting methods taught as an intermediate-level forestry field practicum during the final week of winter break. All day classes take place on the University of Idaho campus.
Experimental Forest. Safety instruction covers methods taught in state and federal land agencies and other popular faller safety programs.

Prerequisite: Instructor Permission

Rationale: There have been many requests from Forest Resources and Fire Ecology and Management students to offer a short course in chainsaw safety and falling. Requests and associated discussion are documented in the minutes from past Society of American Foresters (SAF) and Student Association of Fire Ecology (SAFE) club meetings. The University of Idaho Experimental Forest maintains a large shop tailored to chainsaw safety and maintenance for summer Student Logging Crew and other operations, and thus has much of the safety personal protective equipment, custom vehicles, and other items in place to support this course.

For 546 Science Synthesis and Communication (3 cr)
This course is an online course only. Critically review science literature and write both brief and in-depth syntheses to address applied questions in science and management. Learn best practices for summarizing and communicating science effectively. Discuss challenges for application of science in management. Examples will focus on wildland fire science and management.

Recommended Short Course Title: ????

Rationale: This course was developed to support the new Fire Ecology & Management specialization within the UI/CNR Masters of Natural Resources (MNR) degree program. It is one of the core courses in the specialization. We expect this to be taken by students in the Master of Natural Resource program, including but not limited to those focused on fire ecology and management. This course fulfills a key learning outcome in the degree: “Effectively synthesizing scientific knowledge to address science and management issues.” Funding is provided to hire a PhD-level instructor to teach this course within the Fire Ecology & Management specialization within the UI/CNR Masters of Natural Resources (MNR) degree. This is not expected to impact the workload of existing faculty.

Course learning outcomes are consistent with and contribute to program learning outcomes for the Masters of Natural Resources program.

For 557 Advanced Fire Behavior (3 cr)
Credit may be earned in only one of the following: For 450 or For 557. This course is an online course only. Understand the processes that control fire behavior in forest and rangelands, including combustion, emissions and heat release, and related fire effects. Use theory and advanced knowledge with scientific literature and case studies to critically assess the assumptions and limitations of limitations of surface and crown fire models, including the varying influences of fuels, terrain, and environmental conditions.

Rationale: This course was developed to support the new Fire Ecology & Management specialization within the UI/CNR Masters of Natural Resources (MNR) degree program. It is one of the core courses in the specialization. The course was developed by an internationally recognized expert in fire science, and will be taken by students in the Master of Natural Resource program, including but not limited to those focused on fire ecology and management. This course fulfills key learning outcomes in the degree, including “Quantifying and interpreting fire behavior and effects at multiple temporal and spatial scales,” and “Analyzing and interpreting data scientifically.” Funding is provided to hire a PhD-level instructor to teach this course within the Fire Ecology & Management specialization within the UI/CNR Masters of Natural Resources (MNR) degree. This is not expected to impact the workload of existing faculty. Course learning outcomes are consistent with and contribute to program learning outcomes for the Master of Natural Resources program.

For 587 Wildland Fire Policy (2 cr)
This course is an online course only. Relationships between fire science and management and the federal laws and regulations that affect fire management in wildland ecosystems; the politics of wildland fire; and the effects of wildland fire on wildland-urban interface (WUI) communities. Recommended preparation is an upper division course in natural resource, environmental policy, or FOR 584. (Fall only)

Rationale: This course was developed to support the new Fire Ecology & Management specialization within the UI/CNR Masters of Natural Resources (MNR) degree program. It is one of the core courses in the specialization. It also fulfills the “Policy” requirement in the overall MNR degree. It is being offered as a “504” course this fall and has 10 students enrolled. The course was developed by a senior faculty member in the department who has been involved in the fire program and in forest policy since the establishment of the undergraduate fire degree program, and this faculty member plans to continue to teach the online courses that have been developed in the policy area, so this does not add to existing faculty workloads.

3. Change the following courses:

For 102 Introduction to Forest Management (1 cr)
Intro to forestry, current management issues, timber and non-timber resources, educational and professional opportunities. Includes regional field trips ranging in length from one afternoon to one weekend.

Rationale: Clarifies student expectations and allows for broader learning outcomes.

For 221 Ecology (3 cr)
Same as REM 221. Fundamental principles of ecology. Major topics covered in the course include the physical environment, how organisms interact with each other and their environment, evolutionary processes, population dynamics, communities, energy flow and ecosystems, human influences on ecosystems, and the integration and scaling of ecological processes through systems ecology. Computer-based materials are used extensively in REM 221 for guided independent learning of ecology (course information: 

Page 5 of 12
EcologyOnline.net). An online version of REM 221 is offered as a separate section. Recommended Preparation: Introductory botany and zoology systems; and for REM 221 good working knowledge of Windows-based computer systems. Recommended preparation: introductory botany and zoology.

Prereq: Biol 102/102L, Biol 114, Biol 115, 116, or Pisc 205; or Permission

Rationale: FOR221 and REM221 are the same course. The cross listing allows students to take either course to satisfy their CNR degree requirements. Cross-listing will be especially beneficial for students who need to retake the class and must sign up for the other, cross-listed course due to scheduling.

For 373–273 Forestry Sampling Methods (2 cr)
Principles and practice of natural resource inventory, forest sampling and data analysis techniques, LiDAR, forest growth, and quantitative decision support. Lab analysis examples and use of Excel and statistical packages are integrated into lectures. (Fall only)
Coreq: For 274 and Stat 251

Rationale: We request that this course number be changed from FOR 373 to FOR2xx to reflect that it should be taken during the sophomore year. The Department faculty believe that this change will strengthen the academic program by making the recommended order of courses clearer to students.

For J454/J554 Air Quality, Pollution, and Smoke Management (3 cr)
Assessment of the controls and drivers of emission processes and impacts on air quality from agricultural, prescribed, and wildfires, industry, and other natural sources. Overview of the combustion and emission process, how these emissions impact the ‘quality of air’, and what models exist to monitor the emission. Other topics to include: recent EPA and other guidelines for smoke management planning, attainment issues, atmospheric transport and deposition processes, collaborative process for implementing smoke management plans. Additional work required for graduate credit.

Prereq: For 326

Recommended Short Course Title: ????

Rationale: I would like to request that the course title and description be changed to reflect the broader course content following its recent redesign. Given the course is joint listed I would also like to remove its prerequisite to encourage broad participation. I feel the revised course name and description helps to strengthen the Fire Ecology and Management Program and Master of Natural Resources Program by 1. Accurately portraying course content and 2. Providing students with a complete cradle-to-grave picture of air quality emissions from their source, the transport processes through the atmosphere, to their ultimate deposition.

For 584 Natural Resource Policy Development (3 cr)
This course is an online course only. The development of natural resource policy with emphasis on the policy process at the federal level in the U.S.; the role of and interrelationships between staff, committees, agencies and elected officials; the relationship of science and scientists with policy and politicians in the development of natural resource policy, including preparation of testimony related to natural resource science and policy issues; implementation of policy within the natural resource agencies and judicial interpretation of major natural resource policies in the U.S. Recommended Preparation: An upper-division course in natural resource and/or environmental policy. (Spring only)
Prereq: Undergraduate course in natural resource policy or political science or Permission

Rationale: Clarifies that this is an online course only and is offered spring semesters. Dropped the Prereq and added “Recommended preparation…” within the description.

REM 221 Ecology (3 cr)
See For 221 Fundamental principles of ecology. Major topics covered by the course include the physical environment, how organisms interact with each other and their environment, evolutionary processes, population dynamics, communities, energy flow and ecosystems, human influences on ecosystems, and the integration and scaling of ecological processes through systems ecology. Computer-based materials are used extensively for guided independent learning of ecology. An online version of this course is offered as a separate section. Course information: EcologyOnline.net. Recommended Preparation: Introductory botany, zoology and good working knowledge of Windows-based computer systems.
Prereq: Biol 102/102L, 115, or 116; or Permission

Rationale: FOR221 and REM221 are the same course. The cross listing allows students to take either course to satisfy their CNR degree requirements. Cross-listing will be especially beneficial for students who need to retake the class and must sign up for the other, cross-listed course due to scheduling.

4. Change the curricular requirements of Forest Resources (B.S.For.Res.): Students pursuing a B.S. degree in forest resources must receive a grade of C or better in the following indicator courses to register for upper-division courses in forest resources and to graduate with a B.S.For.Res.: Math 143, Stat 251, For 221, and For 274. Students must also have a minimum cumulative grade-point average of 2.00 in forest resource (For) courses to qualify for the B.S. degree in forest resources.

Required course work includes the university requirements (see regulation J-3) and:
Biol 115 Cells and the Evolution of Life (4 cr)
CSS 383 Natural Resource and Ecosystem Service Economics (3 cr)
Econ 202 Principles of Microeconomics (3 cr)
For 102 Introduction to Forest Management (1 cr)
For 235 or CSS 235 Society and Natural Resources (3 cr)
Ent 469 Introduction to Forest Insects (2 cr)
For 274 Forest Measurement and Inventory (3 cr)
For 320 Dendrology (4 cr)
For 324 Forest Regeneration (3 cr)
For 330 Forest Soil and Canopy Processes (4 cr)
For 373 Forestry Sampling Methods (2 cr)
For 375 Introduction to Spatial Analysis for Natural Resource Management (3 cr)
For 424 Forest Dynamics and Management (4 cr)
For 430 Forest Operations (3 cr)
For 462 Watershed Science and Management (3 cr)
For 430 Forest Operations (3 cr)
For 468 Forest and Plant Pathology (2 cr)
For 484 Forest Policy and Administration (2 cr)
Math 143 Pre-calculus Algebra and Analytic Geometry (3 cr)*
Math 144 Analytic Trigonometry (1 cr)
NR 101 Exploring Natural Resources (1 cr)
Soil 205, 206 The Soil Ecosystem and Lab (4 cr)
Stat 251 Statistical Methods (3 cr)
One of the following (4 cr):
Biol 116 Organisms and Environments (4 cr)
PSc 205 General Botany (4 cr)
One of the following (4 cr):
Chem 101 Introduction to Chem I (4 cr)
Chem 111 Principles of Chem I (4 cr)
One of the following (3 cr):
Engl 313 Business Writing (3 cr)
Engl 317 Technical Writing (3 cr)
One of the following (3 cr):
For 221 Ecology (3 cr)
REM 221 Ecology (3 cr)
One of the following (4 cr):
Phys 100, Phys 100L Fundamentals of Physics and Lab (4 cr)
Phys 111, Phys 111L General Physics I and Lab (4 cr)
Restricted Electives (11 cr):
AgEc 477 Law, Ethics, and the Environment (3 cr)
Biol 213 Principles of Biological Structure and Function (4 cr)
Biol 421 Advanced Evolutionary Biology (3 cr)
CSS 486 Public Involvement in Natural Resource Management (3 cr)
CSS 490 Wilderness and Protected Area Management (3 cr)
Fish 314 Fish Ecology (3 cr)
Fish 415 Limnology (4 cr)
Fish 430 Riparian Ecology and Management (3 cr)
For 255 Nursery Irrigation and Fertilization (1 cr)
For 326 Fire Ecology and Management (3 cr)
For 427 Prescribed Burning Lab (3 cr)
For 431 Low Volume Forest Roads (2 cr)
For 436 Cable Systems (2 cr)
For 472 or REM 472 Remote Sensing of the Environment (4 cr)
For 497 Senior Thesis (2-4 cr)
Geog 301 Meteorology (3 cr)
Geog 385 GIS Primer (3 cr)
Geol 111, Geol 111L Physical Geology for Science Majors (4 cr)
Math 160 Survey of Calculus (4 cr)**
Math 170 Analytic Geometry and Calculus I (4 cr)**
PolS 364 or Politics of the Environment (3 cr)
CSS 364: GIS Applications in Fire Ecology and Management (2 cr)
REM 407: Principles of Vegetation Measurement and Assessment (2 cr)
REM 410: Ecological Monitoring and Analysis (2 cr)
REM 429: Landscape Ecology (3 cr)
REM 440: Wildland Restoration Ecology (2 cr)
REM 459: Rangeland Ecology (2 cr)
REM 460: Integrating GIS and Field Studies in Rangelands (2 cr)
RMat 321: Renewable Materials Anatomy and Properties (3 cr)
RMat 444: Primary Products Manufacturing (3 cr)
Soil 446: Soil Fertility (1-3 cr)
Soil 454: Soil Development and Classification (3 cr)
Stat 431: Statistical Analysis (3 cr)
WLF 314: Wildlife Ecology I (3 cr)
WLF 316: Wildlife Ecology II (3 cr)
WLF 440: Conservation Biology (3 cr)

Courses to total 120 credits for this degree

*Note: A SAT math score of 610 or above, or ACT math score of 27 or above can be used to satisfy the Math 143 and Math 144 requirements.

**Note: Either Math 160 or Math 170 may be used as a restricted elective, but not both.

Rationale: Make FOR 255 a restricted elective for the B.S. Forest Resources degree.

Natural Resources

1. Add the following courses:

**NR 512 Computational Data Analysis and Visualization in Natural Resources (3 cr)**
Access, prepare, manipulate, and visualize (large) datasets common to natural resource and environmental sciences by using command-line computer programs (e.g., R, MATLAB). Develop critical thinking, technical, and programming skills needed to automate and customize data analysis, including data exploration, basic statistics, and Monte Carlo methods. Apply best practices in "open science," including accessing code and contributing code developed as part of your research. Approximately 75% lecture and 25% discussion; weekly lab exercises reinforce material. Students should make significant progress on data analysis for research over the duration of this course.

**Prereq:** Stat 431 or Permission

Recommended Short Course Title: Data Analysis & Visualization

Rationale:
Rationale / Need: Accessing and analyzing data in a computer programming environment is a key skill needed by graduate students and professionals in natural sciences. Learning a programming language will improve student’s ability to think quantitatively, understand datasets, test alternative hypotheses, and utilize existing data relevant to ecological and natural resource sciences. In short, this course will help students become better scientists.

There are no similar courses offered at the graduate level in the College of Natural Resources. Taught as a special topics course in 2012 and 2014 (“FOR 504-xx”), the course enrolled 10 and 18 students in each offering, and is expected to maintain a similar enrollment in the future.

Added workload: The current topics version of this course has been offered by Assistant Professor Philip Higuera, as part of his graduate teaching load. Thus, this course would not add to the departmental workload.

**NR 520 Preparing Scientific Manuscripts (2 cr)**
Details the preparation of manuscripts for thesis chapters and submission to peer-reviewed journals. Exercises include identifying scope, unique requirements for manuscript parts, use of graphing and reference database tools, editing and peer reviewing. Two 75 min classes per week, first half of semester. Second half of semester involves weekly writing workshops to finalize projects. Entry into class requires possession of analyzed dataset.

**Prereq:** Permission

Recommended Short Course Title: Preparing Science Manuscripts

Rationale: There is large demand for assistance with manuscript preparation. Graduate students are often required to prepare publishable manuscripts to include in their thesis. Faculty, repeatedly instruct individual students on the steps to manuscript preparation. This class achieves both objectives by providing graduate students with the information required to draft complete scientific manuscripts. Existing faculty currently offer this class. This course has previously been taught as a 504 course and was well received by students.
NR 525 Scientific Graphics Design (3 cr)
Principles of graphics design for science, including the graphical presentation of data for printed and electronic journals, poster presentations, and oral presentations. Students will analyze published scientific graphics as well as learn to design their own graphs based on data from their graduate research or other sources.

Rationale:
This course provides graduate students with essential knowledge, understanding, and skills for the graphical representation of scientific data: for print, digital, and oral presentation. This course is an essential part of the curriculum for the Master of Natural Resources (MNR) graduate program and is of college-wide interest to graduate students.

This course will be offered online (as previously offered as a NR 504 special topics course) with a “hands-on” pedagogical approach: learning takes place in a continual process of student projects and assessment (e.g., graphical projects submitted by students are reviewed by the professor, returned to the student for revision, and returned to the professor) until mastery is achieved.

Including the upcoming summer session 2014, this online course will have been successfully offered three times as a special topics online course (NR 504-40), and thus there is demonstrated interest for this graduate skills course.

This course is offered only during summer session and thus does not affect instructor’s workload and will not diminish any departmental or college resources or programs.

2. Change the curricular requirements of Natural Resource Conservation (B.S.Nat.Resc.Consv.):

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

CSS 235 Society and Natural Resources (3 cr)
CSS 287 Foundations of Conservation Leadership and Management (taken simultaneously with NR 101) (3 cr)
CSS 383 Natural Resource and Ecosystem Service Economics (3 cr)
CSS 387 Environmental Communication Skills (3 cr)
Econ 202 Principles of Microeconomics (3 cr)
For 375 Introduction to Spatial Analysis for Natural Resource Management (3 cr)
NR 101 Exploring Natural Resources (taken simultaneously with CSS 287) (1 cr)
Stat 251 Statistical Methods (3 cr)
One writing course, such as Engl 207, Engl 208, Engl 313, Engl 316, Engl 317 (3 cr)

One of the following (3 cr):
For 221 Ecology (3 cr)
REM 221 Ecology (3 cr)

One of the following (3-4 cr):
Math 143 Pre-calculus Algebra and Analytic Geometry (3 cr)
Math 160 Survey of Calculus (4r)
Math 170 Analytic Geometry and Calculus I (4 cr)

And one of the following emphases:

A. Conservation Planning and Management Emphasis
Students must attend one, two-week long field studies course during summer session. Special fees are required for this and a few other courses. To graduate a student must earn an average GPA 2.30 or higher in all CSS courses.

CSS 304 Conservation Social Sciences Field Studies (3 cr)
CSS 310 Social Research Methods in Conservation (4 cr)
CSS 364 Politics of the Environment (3 cr)
CSS 385 Conservation Management and Planning I (4 cr)
CSS 475 Conservation Management and Planning II (4 cr)
CSS 486 Public Involvement in Natural Resource Management (3 cr)
CSS 489 Personalities and Philosophies in Conservation (3 cr)

One of the following (4 cr):
Biol 102, Biol 102L Biology and Society and Lab (4 cr)
Biol 115 Cells and the Evolution of Life (4 cr)

One of the following (2-4 cr):
Comm 101 Fundamentals of Public Speaking (2 cr)
One semester of a foreign language course

One of the following (3 cr):
PolS 101 Intro to Political Science and American Government (3 cr)
PolS 275 American State and Local Government (3 cr)

One of the following (4 cr):
Chem 101  Introduction to Chem I (4 cr)
Chem 111  Principles of Chem I (4 cr)
Geol 101, Geol 101L  Physical Geology and Lab (4 cr)

One of the following (3 cr):
For 326  Fire Ecology and Management (3 cr)
REM 440  Wildland Restoration Ecology (3 cr)
REM 459, REM 460  Rangeland Ecology (2 cr) and Integrating GIS and Field Studies in Rangelands (2 cr)
WLF 314  Wildlife Ecology I (3 cr)

Two of the following (6 cr):
CSS 490  Wilderness and Protected Area Management (3 cr)
CSS 493  International Land Preservation and Conservation Systems (3 cr)
LArc 480  The Emerging Landscape (3 cr)
WLF 440  Conservation Biology (3 cr)

Two of the following (6 cr):
Anth 100  Introduction to Anthropology (3 cr)
Psyc 101  Introduction to Psychology (3 cr)
Soc 101  Introduction to Sociology (3 cr)

12 credits (if not chosen above) from the following, in at least 2 disciplines with at least 2 courses in one discipline:
AgEc 477  Law, Ethics, and the Environment (3 cr)
Anth 428  Social and Political Organization (3 cr)
Bus 321  Marketing (3 cr)
Comm 410  Conflict Management (3 cr)
CSS 462  Natural Resource Policy (3 cr)
CSS 487  Environmental Education (3 cr)
CSS 490  Wilderness and Protected Area Management (3 cr)
CSS 492  Ecotourism Principles and Issues (3 cr)
CSS 493  International Land Preservation and Conservation Systems (3 cr)
CSS 496  Monitoring Impacts in Protected Areas and Wilderness (3 cr)
CSS 498  Internship (3-6 cr)
Geog 313  Social Research Methods in Conservation (4 cr)
Geog 360  Population Dynamics and Distribution (3-4 cr)
Geog 455  Societal Resilience and Adaptation to Climate Change (3 cr)
Hist 423  Idaho and the Pacific Northwest (3 cr)
Hist 424  American Environmental History (3 cr)
JAMM 350  Public Relations Writing and Production (3 cr)
JAMM 444  Mass Media and Public Opinion (3 cr)
Phil 452  Environmental Philosophy (3 cr)
PolS 451  Public Administration (3 cr)
PolS 453  Public Management Techniques (3 cr)
PolS 454  Public Organization Theory (3 cr)
PolS 473  Sustainable Community Development Planning (3 cr)
PolS 480  Politics of Development (3 cr)
Psyc 320  Introduction to Social Psychology (3 cr)
Psyc 325  Cognitive Psychology (3 cr)
Soc 313  Collective Behavior (3 cr)
Soc 343  Political Sociology (3 cr)

Courses to total 120 credits for this degree

B. Conservation Science Emphasis
To graduate a student must earn an average GPA of 2.00 or higher in all courses taught in the College of Natural Resources and complete an approved professional work experience in natural resources.

CSS 310  Social Research Methods in Conservation (4 cr)

One of the following (4 cr):
Biol 115  Cells and the Evolution of Life (4 cr)
Biol 116  Organisms and Environments (4 cr)

One of the following (4 cr):
Chem 101  Introduction to Chem I (4 cr)
Chem 111  Principles of Chem I (4 cr)

One of the following (4 cr):
CSS 364  Politics of the Environment (3 cr)
CSS 462  Natural Resource Policy (3 cr)
One of the following (4 cr):

CSS 385 Conservation Management and Planning I (4 cr)

CSS 475 Conservation Management and Planning II (4 cr)

CSS 490 Wilderness and Protected Area Management (3 cr)

Natural Resource Science Restricted Electives (33 cr), at least 15 cr must be at the 400-level:

Fishery Science (6 cr):
Fish 314 Fish Ecology (3 cr)
Fish 315 Fish Ecology Lab (1 cr)
Fish 316 Principles of Population Dynamics (2 cr)
Fish 415 Limnology (4 cr)
Fish 418 Fisheries Management (4 cr)
Fish 422 Concepts in Aquaculture (3 cr)
Fish 424 Fish Health Management (4 cr)
Fish 430 Riparian Ecology and Management (3 cr)

Fire Ecology and Management (3 cr):
For 326 Fire Ecology and Management (3 cr)
For 433 Fire and Fuel Modeling (2 cr)
For 450 Fire Behavior (2 cr)
For 454 Air Quality and Smoke Management (3 cr)

Forestry (6 cr):
For 320 Dendrology (4 cr)
For 324 Forest Regeneration (3 cr)
For 330 Forest Soil and Canopy Processes (4 cr)
For 373 Forestry Sampling Methods (2 cr)
For 424 Forest Dynamics and Management (4 cr)
For 425 Forest and Soil Nutrient Cycling (3 cr)
For 430 Forest Operations (3 cr)
For 431 Low Volume Forest Roads (2 cr)
For 436 Cable Systems (2 cr)
For 462 Watershed Science and Management (3 cr)
For 468 Forest and Plant Pathology (2 cr)
For 472 Remote Sensing of the Environment (4 cr)

Renewable Materials (6 cr):
RMat 321 Properties of Renewable Materials (3 cr)
RMat 365 Wood Building Technology (3 cr)
RMat 436 Biocomposites (3 cr)
RMat 438 Introduction to Lignocellulosic Chemistry (1 cr)
RMat 444 Primary Products Manufacturing (3 cr)
RMat 450 Biomaterials Deterioration and Protection (2 cr)
RMat 491 Biomaterial Product and Process Development Lab (2 cr)
RMat 495 Product Development and Brand Management (3 cr)

Rangeland Ecology and Management (6 cr):
REM 341 Systematic Botany (3 cr)
REM 410 Principles of Vegetation Measurement and Assessment (2 cr)
REM 411 Rangeland Ecology Current Topics and Field Studies (1 cr)
REM 440 Wildland Restoration Ecology (3 cr)
REM 452 Western Wildland Landscapes (2 cr)
REM 456 Integrated Rangeland Management (3 cr)
REM 459 Rangeland Ecology (2 cr)
REM 460 Integrating GIS and Field Studies in Rangelands (2 cr)
REM 472 Remote Sensing of the Environment (3-4 cr)

Wildlife Science (6 cr):
WLF 314 Wildlife Ecology I (3 cr)
WLF 315 Wildlife Ecology I Laboratory (1 cr)
WLF 316 Wildlife Ecology II (4 cr)
WLF 440 Conservation Biology (3 cr)
WLF 445 Fish and Wildlife Population Ecology (4 cr)
WLF 482 Ornithology (4 cr)
WLF 492 Wildlife Management (4 cr)

Courses to total 120 credits for this degree

Rationale: Conservation Planning and Management Option: Adds an important and contemporary set of topics to broaden student’s awareness. Exit interviews and focus groups with students have indicated that students would like to have these subjects included as electives. Conservation Science Option: This gives the students in the Conservation Science Emphasis greater selection in management and planning courses. CSS 475 is being added to an existing bin; it is also a senior experience offering, and the degree with this emphasis will now offer students in this option the choice of any of the senior experience courses in CNR. CSS 310 was
added to this emphasis area as a result of student suggestions; exit interviews and focus groups with students have indicated that students would like to have the skills and understanding that this class offers. Courses are already offered, so no additional faculty workload.