11-3-2011

Curriculum Subcommittee Minutes, November 3, 2011

Utah State University

Follow this and additional works at: https://digitalcommons.usu.edu/fs_edpol

Recommended Citation
https://digitalcommons.usu.edu/fs_edpol/674

This Curriculum Subcommittee Minutes is brought to you for free and open access by the Faculty Senate at DigitalCommons@USU. It has been accepted for inclusion in Educational Policies Committee by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.
A meeting of the Curriculum Subcommittee of the Educational Policies Committee was held on 3 November 2011 at 2 p.m. in Old Main 136 (Champ Hall Conference Room).

Present: Ed Reeve, Chair, College of Engineering
Thomas Bunch, Agriculture
Darrin Brooks, Caine College of the Arts
Chris Skousen, Huntsman School of Business
Martha Dever, Emma Eccles Jones College of Education and Human Services (representing Scott Hunsaker)
Patricia Lambert, College of Humanities and Social Sciences (representing Patricia Gantt)
Nancy Mesner, College of Natural Resources
Wendy Holliday, Libraries
Travis Peterson, Regional Campuses and Distance Education
Steve Beck, Graduate Council (representing Shelly Lindauer)
Tanner Wright, Academic Senate President
Roland Squire, Registrar’s Office
Cathy Gerber, Registrar’s Office

Absent: Richard Mueller, College of Science
Norm Jones, General Education Subcommittee Chair
Cami Jones, Graduate Studies Vice President

Visitors: Rebecca Lawver, Agricultural Systems Technology and Education
Brad Hall, Department Head, Languages, Philosophy and Speech Communication
Paul Jakus, Department Head, Applied Economics
Michele Hillard, Provost Office

Tom Bunch moved to approve the minutes of the 6 October 2011 meeting. Nancy Mesner seconded, motion approved.

Tom Bunch moved to approve the business of the College of Agriculture. Chris Skousen seconded; motion approved.

**College of Agriculture**

**Department of Nutrition, Dietetics and Food Sciences**

Add Repeatable for Credit

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDFS 6050</td>
<td>Community Nutrition Internship</td>
<td>2-6 cr.</td>
</tr>
</tbody>
</table>

Repeatable for credit

Effective Summer 2012
NDFS 6250 Clinical Nutrition Internship
   Repeatable for credit
   Effective Summer 2012

NDFS 6350 Food Service Management Internship
   Repeatable for credit
   Effective Summer 2012

Department of Landscape Architecture and Environmental Planning

Prerequisite Change
LAEP 1300 Computer Applications in Landscape Architecture
   Prerequisite: Must be an LAEP major
   Effective Summer 2012

LAEP 6410 Redefining the Urban Landscape
   Prerequisites: LAEP 2700 and 2720
   Effective Summer 2012

Darrin Brooks moved to approve the business of the Cain College of the Arts. Tom Bunch seconded; motion approved.

Caine College of the Arts

Department of Art

University Studies Request
ARTH 2730 Art of the African Diaspora
   University Studies Designation: BHU
   Effective Spring 2012

Delete Course
ART 3210 Classical Mythology
   CLAS 3210 is NOT being deleted
   Effective Fall 2011

ART 3260 Anatomy for Artists
   Effective Fall 2011

Chris Skousen moved to approve the business of the Huntsman School of Business. Tom Bunch seconded; motion approved.

Huntsman School of Business

Department of Management Information Systems

Prerequisite Change, Course Description Change
OSS 1400 Microcomputer Applications
   No prerequisite needed
   Effective Spring 2012
Prerequisite Change
MIS 3330  Database Management  3 cr.
Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; completion of at least 40 credits; MIS 2100 or OSS 2450 or permission of instructor
Effective Spring 2012

Martha Dever moved to approve the business of the Emma Eccles Jones College of Education and Human Services. Darrin Brooks seconded; motion approved.

**Emma Eccles Jones College of Education and Human Services**

Dual List Change
EDUC 6780  Qualitative Methods II  3 cr.
Remove dual list of EDUC 7780
EDUC 6780 inactivated Fall 2011
Effective Summer 2012

**Department of Health, Physical Education and Recreation**

Reactive Course
PRP 2500  Outdoor Recreation Management  3cr.
Effective Summer 2012

**Elementary and Secondary Education Program (School of TEAL)**

New Course
ELED 4150  Assessment and Differentiation Across the Curriculum  2 cr.
Effective Spring 2012

Prerequisite Change
ELED 5050  Student Teaching-Kindergarten  3-6 cr.
Prerequisite: ELED 4480
Pass/Fail only
Effective Fall 2012

Title Change, Course Description Change
SCED 4210  Assessment and Curriculum Design  3 cr.
Previously Cognition and Evaluation of Student Learning
Effective Fall 2012

**Department of Special Education and Rehabilitation**

Credit Hour Change
SPED 6900  Independent Study  1-3 cr.
Previously 1-2 cr.
Repeatable for credit
Effective Spring 2012
SPED 6910  Independent Research  1-3 cr.
Previously 1-2 cr.
Repeatable for credit
Effective Spring 2012

Title Change, Course Description Change
SPED 7830  Personal Preparation in Disability Disciplines  2 cr.
Previously Special Education Personnel Preparation Methods
Effective Summer 2012

Chris Skousen moved to approve the business of the College of Engineering. Tom Bunch seconded; motion approved.

**College of Engineering**
New Course
ENGR 2455  Numerical Methods for Engineers Laboratory  1 cr.
Corequisite: ENGR 2450
This course is only available at USU-Eastern
Effective Spring 2012

Patricia Lambert moved to approve the business of the College of Humanities and Social Sciences. Nancy Mesner seconded; motion approved.

**College of Humanities and Social Sciences**
Department of History
New Course
HIST 4650  Women and Gender in the US West  3 cr.
University Studies Designation: DHA
Effective Spring 2012

University Studies Request
HIST 3530  African Environmental History  3 cr.
University Studies Designation: DHA
Effective Spring 2012

Change Multiple List
ARTH/CLAS/RELS 3210  Classical Mythology  3 cr.
Add multiple list of ARTH/RELS 3210
Remove multiple list of ART 3210
Effective Summer 2012

**Department of Journalism and Communication**
Prerequisite Change
JCOM 1130  Beginning Newswriting for the Mass Media  3 cr.
Prerequisites: Fulfillment of Communications Literacy CL1 requirement through coursework or examination and English Proficiency Test offered through the Journalism and Communication Department
Effective Spring 2012
Department of Languages, Philosophy and Speech Communication
New Course
ARBC 1800  Study-Abroad Arabic Language and Society I  1-8 cr.
Effective Summer 2012

ARBC 2800  Study-Abroad Arabic Language and Society II  1-8 cr.
Effective Summer 2012

Nancy Mesner moved to approve the business of the College of Natural Resources. Tom Bunch seconded; motion approved.

College of Natural Resources
Department of Environment and Society
New Course
ENVS 6010  Applying Human Dimensions Concepts to Natural Resource Management  3 cr.
Effective Spring 2012

Martha Dever moved to approve the business of the College of Science. Nancy Mesner seconded; motion approved.

College of Science
Department of Biology
Prerequisite Change
PUBH 4030  Communicable Disease Control  3 cr.
Prerequisite: BIOL 1610 or 2060 or 2420
Effective Fall 2012

Department of Geology
New Course
GEO 4800  Senior Seminar  1 cr.
Repeatable for credit
Pass/Fail only
Prerequisite: Permission of instructor
Effective Spring 2012

Prerequisite Change, Course Description Change
GEO 3700  Structural Geology  4 cr.
Prerequisite or corequisite: PHYS 2210 and 2215
Effective Summer 2012

Department of Physics
New Course
PHYS 5700  Introduction to Microfabrication  3 cr.
Prerequisites: PHYS 2210, 2215, 2225; permission of instructor
Effective Spring 2012
Other Business

Nancy Mesner moved to approve the request from the Department of Watershed Sciences to remove the Aquatic Ecology specialization from the MS and PhD degrees in Fisheries Biology. Wendy Holliday seconded; motion approved. (see below)

Nancy Mesner moved to table the request from the Department of Agricultural Systems Technology and Education to eliminate the emphasis areas in the BS program in Agricultural Education. Patricia Lambert seconded; motion approved. This proposal will be submitted to the University Council on Teacher Education.

Patricia Lambert moved to approve the request from Department of Languages, Philosophy and Speech Communication to change the name to the Department of Languages, Philosophy and Communication Studies AND to change the name of the Speech Communication major to Communication Studies. Darrin Brooks seconded; motion approved pending revisions. The revised proposal will be sent to Larry Smith. (see below)

Patricia Lambert moved to approve the request from the Department of English to remove the Plan B and replace it with a Plan C in the English master’s degree specialization in Technical Writing. Nancy Mesner seconded; motion approved. (see below)

Nancy Mesner moved to approve the request from the Department of Nutrition, Dietetics and Food Sciences to add a Plan C option to the Master of Dietetics Administration degree. Tom Bunch seconded; motion approved. (see below)

Tom Bunch moved to approve the request from the Department of Nutrition, Dietetics and Food Sciences change the name of the Master of Food Microbiology and Safety to Master of Food Quality and Safety and that the Plan B degree be replaced with a professional Plan C degree. Darrin Brooks seconded; motion carried. (see below)

Tom Bunch moved to approve the request from the Department of Applies Economics to offer a Master of Science in International Food and Agribusiness. Travis Peterson seconded; motion approved pending revisions. The revised proposal will be sent to Larry Smith.

Tom Bunch moved to approve the request from Department of Applied Economics to offer a Bachelor of Science in Environmental and Natural Resource Economics. Nancy Mesner seconded; motion approved. (see below)

Michele Hillard, Provost Office, gave a presentation on the new EPC website. http://www.usu.edu/epc/
Please contact her with any corrections, suggestions, etc.

Meeting adjourned 2: 55 p.m.
Ed Reeve conducted the meeting.
Cathy Gerber recorded the minutes.
5.4 Transfer, Restructuring, or Consolidation of Existing Programs

Section I: Request

The Department of Watershed Sciences at Utah State University seeks to remove the “Aquatic Ecology” specialization from the MS and PhD degrees in Fisheries Biology. No impact to instructional activities is expected.

Section II: Need

The “Aquatic Ecology” specialization is already and more appropriately housed under the MS and PhD degree in Ecology administered through the Department of Watershed Sciences.

Section III: Institutional Impact

The proposed change will not affect enrollments in the instructional programs of affiliated departments or programs, nor will administrative structures be affected.

Section IV: Finances

No additional costs or savings are anticipated from this change.
R401 Abbreviated Proposal for Name Change of Existing Program
Utah State University

Section I: The Request

Utah State University requests approval to change the name of the Speech Communication major to Communication Studies. This change would also entail changing the name of the Department of Languages, Philosophy and Speech Communication to the Department of Languages, Philosophy and Communication Studies.

Section II: Need

This request is made for two major reasons: to better fit with our national academic discipline and to better meet the needs and interests of our students. The name Speech Communication used to be the most common moniker for a program in our academic field, but now it is rarely used. Indeed, the major association in this field, the National Communication Association, used to be called the Speech Communication Association. It was determined in the 1990’s that this name was misleading and overly narrow given the broad range of communication foci (organizational, interpersonal, intercultural, rhetorical, and many more) taught in the various departments so the organization officially changed its name to the National Communication Association (NCA).

After this national change many departments dropped the term speech communication in the 1990’s. Currently of the 719 member departments in NCA only 27 (just under 4%) still use the title “Speech Communication.” The most common title is either Communication or Communication Studies which is used by about 75% of the departments with this major. The title of speech communication currently dates the department in a way that is not accurate (too limited) in terms of what our faculty members study and the education our students receive.

We are requesting the title Communication Studies to avoid confusion with the Journalism focused program at USU that also uses the term “communication.” The two programs are distinct in many ways and are affiliated with entirely separate national organizations. None of the 111 departments in the Accrediting Council for Journalism and Mass Communication uses the title “Communication Studies.” Thus our use of Communication Studies will maintain this distinction and at the same time fit the norms of our national organization. It is worth noting that 7 of the 10 peer institutions recognized by the Board of Regents in July of 2011 also use the title “Communication Studies” for their programs that compare in substance to our current speech communication program (these institutions all have separate Journalism focused departments just as we do at USU).

The second major reason we are making this request comes from exit interviews with the students about to graduate and from a recent survey we conducted with all of our majors. A clear majority of students prefer the name Communication Studies (77%) and their comments about this proposal have been very positive, many noting that it will help avoid confusion about what they study and with speech pathology programs.

Section III: Institutional Impact

No changes in faculty, staff, or facilities are anticipated as a result of this change. As explained in the needs section, the change will better position the department and the students graduating from this major. It will identify the major within the department more accurately with the national field and give the department a name that better fits the current field. The students will also be better served as they look forward to going to graduate school or moving forward with their careers.

Section IV: Finances

There will be some very minor costs as we transition to the new name that the department will cover, but no significant budgetary impact is anticipated as a result of this name change.
R401-5. Request for Restructuring of an Existing Program

Section I: Request
The Utah State University English Department requests that its English master’s degree specialization in Technical Writing, which was approved for online delivery in 1998 as a 30-credit Plan B specialization, be changed to a 33-credit Plan C specialization. No impact on the program is anticipated.

Section II: Need
The Technical Writing master’s degree specialization is offered online to serve a non-traditional student population of working professional communicators—students who work as editors, software documentation writers, publications managers, website developers, etc.

Plan C would allow the Technical Writing specialization to recruit and graduate students who live and work anywhere in the world where there is internet access, without requiring them to travel to Logan to complete the degree. Plan C would help the specializations better achieve its mission and goals of serving nontraditional students who work full time as professional communicators, and it would allow the specialization to compete better with other online technical communication programs around the country.

Section III: Institutional Impact
No institutional impact is expected from changing the specialization from Plan B to Plan C.

Section IV: Finances
No financial impact is expected from changing the specialization from Plan B to Plan C.
Institution Submitting Proposal:
Utah State University

College, School or Division in Which Program/Administrative Unit Will Be Located:
College of Humanities and Social Sciences

Department(s) or Area(s) in Which Program/Administrative Unit Will Be Located:
English

Program/Administrative Unit Title:
Master's degree program in English

Recommended Classification of Instructional Programs (CIP) Code:
23.1101

Certificate, and/or Degree(s) to Be Awarded:
MA/MS in English

Proposed Beginning Date:
Program already exists.

Institutional Signatures (as appropriate):

___________________________
Jeannie Thomas
Department Head, English

___________________________
John Allen
Dean, College of Humanities and Social Sciences

___________________________
Mark R. McLellan
Vice President for Research & Graduate School Dean

___________________________
Raymond Coward
Provost, Executive Vice President

___________________________
Stan Albrecht
President

Date: October 19, 2011
Section 1: Request

The present online Master of Dietetics Administration (MDA) degree offered by the Department of Nutrition, Dietetics, and Food Sciences, which is part of the College of Agriculture at Utah State University, is proposing to add a Plan C option. The Plan C option would be a coursework only option requiring 41 credits total.

Section II: Need

Each year 60 students complete the Utah State University Dietetics Distance Internship. As graduates of that program they are eligible to complete the Master of Dietetics Administration degree. However, as the program currently offers only a Plan B option, enrollment is limited by the number of faculty available to serve on graduate committees. Currently only 27% of qualified applicants are accepted for the Plan B option. A recent demand survey of USU Dietetics Distance Internship graduates from the past 5 years indicated that 87% of distance internship graduates (equivalent to approximately 50 students each year) are interested in the MDA program. However, 69% cite the cap on enrollment and competition to get in as major hindrances to applying. The professional nature of the MDA degree is conducive to a Plan C option. The program is a unique professional degree offered in partnership with the USU Dietetics Distance Internship. Its goal is to prepare students to move into management positions in health care, food service, and community nutrition programs. A Plan C option would require more credits to complete with a focus on professional skill development as is consistent with other professional programs including MPA/MBA programs. It would be taught by adjunct faculty, currently working in the field of dietetics administration. With the elimination of the graduate committee, the Plan C option would also allow for higher enrollment.

Section III: Institutional Impact

Utah State University Distance Internship graduates will be the source for enrollment in the Plan C option. Because of the specific pool of candidates, the Plan C option will not compete with enrollment in affiliated graduate programs. The opportunity to complete a graduate degree in distance format and using credits from the internship experience may also increase interest in the USU Distance Internship. The new option will include two additional electives; Advanced Dietetics Practicum and Entrepreneurial Skills in Dietetics and taught by currently appointed adjunct faculty working in dietetics administrative positions in the community. No new faculty assignments will need to be made and no physical facilities will be required. Program delivery via online format through Regional Campuses will continue as currently administered. The Plan C option will allow more students to be accepted without the burden on faculty for graduate committees.

Section IV: Finances

The Plan C option will entail additional costs for adjunct faculty compensation and equipment/technology related to online delivery of the program estimated at approximately $11,500 annually. Financial projections indicate that enrollment of 15 students each year will yield more than double the estimated additional costs.
Course Requirements

Plan B Project Track (Current Program)

Transfer Courses from USU DI
- NDFS 6350/6360 Food Service Intern I and II 12 credits
- NDFS 6050/6060 Community Intern I and II 6 credits
- NDFS 6250/6260 Clinical Intern I and II 8 credits

26 credits

Courses Required for MDA
- NDFS 6770 Advanced Management of Dietetics I 3 credits
- NDFS 6780 Advanced Management of Dietetics II 3 credits
- NDFS 7800 Dietetics Graduate Seminar 1 credit
- NDFS 6970 Project 2 credits
- Quantitative/ Research Elective 3 credits
- Skills Enhancement Elective 3 credits

15 Credits

Quantitative/ Research Elective Course Options
- EDU 6010 Intro to Program Evaluation
- STAT 3000 Statistics for Scientists
- MGT 3700 Operations Management
- FIN 3400 Corporate Finance
- PUBH 4040 Fundamentals of Epidemiology

Skills Enhancement Elective Course Options
- INST 6760 Grant Writing
- PSY 5200 Introduction to Interviewing and Counseling

Course Requirements

Plan C – Course Work only Track (Proposed)

Transfer Courses from USU DI
- NDFS 6350/6360 Food Service Intern I and II 12 credits
- NDFS 6050/6060 Community Intern I and II 6 credits
- NDFS 6250/6260 Clinical Intern I and II 8 credits

26 credits

Courses Required for MDA
- New Course: Entrepreneurial Skills in Dietetics 3 credits
- NDFS 6750 Advanced Dietetic Practicum 3 credits
- NDFS 6770 Advanced Management of Dietetics I 3 credits
- NDFS 6780 Advanced Management of Dietetics II 3 credits
- Quantitative/ Research Elective 3 credits
- Skills Enhancement Elective 3 credits

18 Credits

Quantitative/ Research Elective Course Options
- EDU 6010 Intro to Program Evaluation
- STAT 3000 Statistics for Scientists
- MGT 3700 Operations Management
- FIN 3400 Corporate Finance
- PUBH 4040 Fundamentals of Epidemiology
Skills Enhancement Elective Course Options

- INST 6760 Grant Writing
- PSY 5200 Introduction to Interviewing and Counseling
Section I: Request

The current Master of Food Microbiology and Safety degree offered through the Nutrition, Dietetics and Food Sciences Department at Utah State University is a (Plan B) graduate degree that covers food science and other technology areas related to the manufacture of safe and wholesome foods. It is requested that the name of the degree be changed to Master of Food Safety and Quality (MFSQ) and that the degree be changed from a Plan B to a professional (Plan C) degree.

Section II: Need

In provision of foods to the American population, there is an increased emphasis on the strategies that can be adopted to ensure that both safety and quality become an integral part of the overall food manufacturing and distribution process. These two terms “quality” and “safety” include microbial and non-microbial aspects of food manufacture and better represent the interdisciplinary nature of the food science program, as well as career pathways which become open to graduates with this masters level degree. The MFSQ degree utilizes existing graduate-level courses that are offered by the Nutrition, Dietetics and Food Sciences department as well as courses offered by other departments at Utah State University. The desire to change from a Plan B to a Plan C reflects the directional change of this program to a professional, integrative, and experiential Master’s Degree. Thus, the plan C program is better adapted to meet the needs of typical students who will seek this degree.

Section III: Institutional Impact

Number of credits will change from 32 total credits to 33 total credits as is required for the professional (Plan C) degree.

Section IV: Finances

This change in the program name and degree will not cause any change in finances.
Institution Submitting Proposal: Utah State University

College, School or Division in Which Program/Administrative Unit Will Be Located: College of Agriculture

Department(s) or Area(s) in Which Program/Administrative Unit Will Be Located: Department of Applied Economics

Program/Administrative Unit Title: Bachelor of Science in Environmental and Natural Resource Economics

Recommended Classification of Instructional Programs (CIP) Code: 03.0204

Certificate, Diploma and/or Degree(s) to be Awarded: Bachelor of Science

Proposed Beginning Date: July 1, 2012

Institutional Signatures (as appropriate):

Raymond T. Coward, Chief Academic Officer: ________________________________

Noelle Cockett, Dean, College of Agriculture: ________________________________

Paul M. Jakus, Head, Department of Applied Economics: ______________________
Program Description
The Bachelor of Science in Environmental and Natural Resource Economics (ENRE) is aimed at students seeking an undergraduate degree focused on the efficient allocation of natural resources and amenities. The ENRE degree will be administered by the Department of Applied Economics (APEC) at Utah State University and will make use of courses already offered at USU. The curriculum requirements will consist of 61 credit hours and includes seven APEC courses. An important feature of this degree is that ENRE majors will be required to complete a 15-20 credit “track” or a minor in the College of Natural Resources. Students may choose from one of three required tracks/minor: Environmental Policy and Management, Ecology, and Watershed Science (Appendix D). The minor/track requirement assures that economic training will occur within the context of current natural resource policies or the physical processes of the environment.

Role and Mission Fit
As the state’s Land Grant institution, Utah State University’s mission includes research, education, and outreach in areas including agriculture, engineering, and the sciences. The proposed BS-ENRE degree advances the core values of the institution by providing students skills needed to efficiently allocate and manage natural resource and environmental amenities. The degree complements APEC’s undergraduate degree programs in Agribusiness, International Agribusiness, and Agricultural Economics.

Faculty
Seven APEC faculty members will be responsible for instruction in the environmental and natural resource economics courses offered through APEC and contributing to the ENRE degree (Appendix C).

<table>
<thead>
<tr>
<th></th>
<th>Tenure</th>
<th>Contract</th>
<th>Adjunct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of faculty with Doctoral degrees</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of faculty with Master’s degrees</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of faculty with Bachelor’s degrees</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other Faculty</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

In addition to these seven faculty, USU faculty members in the College of Natural Resources will assume instructional responsibility for the natural science and environmental management components of the curriculum.

Market Demand
According to the USDA (Goecker et al., 2010), significant job opportunities in occupations associated with the ENRE degree are expected in the 2010-2015 period. These jobs result from shifts in employment as opportunities associated with climate change, renewable energy, and environmental restoration become more important in the future. Potential careers include environmental consulting, natural resource and environmental policy analysis, environmental law, and resource management.
**Student Demand**
According to a recent survey of Land Grant Universities by Park (2010), some 27 of APEC’s peer departments offered an ENRE-like major or concentration as of 2009. A key summary statistic reported by Park is that ENRE-like majors were about 25-30% of the number of Agribusiness majors in these departments. Given APEC has approximately 80 majors in its two agribusiness BS programs, we anticipate about 20-22 ENRE majors.

**Statement of Financial Support**
The program will be supported using already appropriated E&G funds.

- Legislative Appropriation ..................X
- Grants.............................................
- Reallocated Funds.........................
- Tuition dedicated to the program........
- Other .............................................

**Similar Programs Already Offered in the USHE**
No similar undergraduate program is offered at any other USHE institution. The University of Utah offers two undergraduate environmental and natural resource economics courses, but no degree. A search of webpages for Dixie State College, Southern Utah University, Utah Valley University, and Weber State University found no courses offered in environmental and resource economics.
Section I: The Request
Utah State University requests approval to offer a Bachelor of Science in Environmental and Natural Resource Economics effective Fall Semester 2012. This program has been approved by the Board of Trustees of Utah State University on _____________

Section II: Program Description

Complete Program Description
The Bachelor of Science in Environmental and Natural Resource Economics (ENRE) is an undergraduate degree to be administered by the Department of Applied Economics using courses that are all currently offered at USU. The degree focuses on the application of economic principles to the efficient allocation of natural resources such as minerals, oil and natural gas, the management of public lands, and pollution of public goods such as air and water. A defining curricular component in the degree program is the required minor or track in disciplines currently housed in the College of Natural Resources. A solid grounding in either environmental policy and management (a track offered by the Department of Environment and Society) or a natural science (Watershed Sciences minor offered by the Department of Watershed Sciences or the Ecology Track offered by the Department of Wildland Resources) assures that an ENRE graduate will learn economic principles in the context of natural resources and the environment.

Purpose of Degree
With increasing competition for limited land, water and other natural resources in the U.S. and throughout the world, as well as growing concern about environmental degradation, there is a growing need for professionals who can assist in the process of balancing economic and environmental tradeoffs. Private firms face serious challenges in meeting stricter environmental regulations and achieving self-imposed environmental goals. Public agencies must continually seek to design policies so that society’s resource conservation or environmental quality goals are achieved in a cost-effective manner. ENRE graduates will be well-prepared to contribute to the goals of organizations and agencies in both the private and public sectors.

Institutional Readiness
APEC currently offers three undergraduate degrees: the BS in Agribusiness, BS in International Agribusiness, and the BS in Agricultural Economics. In addition, the department offers three graduate degrees: an MS in Applied Economics, an MS in Economics and Statistics (jointly administered with the Department of Mathematics and Statistics), and a Ph.D. in Economics. A third MS degree, International Food and Agribusiness, is currently in the review process. The ENRE major will require no new courses.

Faculty
The Department of Applied Economics includes 11 faculty members holding the rank of Assistant Professor or higher, and one Extension Specialist holding an MS degree. Four faculty members have been hired since 2009. All faculty members holding the PhD degree may supervise Senior Projects for ENRE majors. Seven faculty members will be responsible for handling the core curriculum of the proposed degree (Appendix C).
Staff
Based on the study by Park (2010), we anticipate an 20-22 additional students to be advised by APEC personnel. The program requires no lab technicians, additional secretarial support, or teaching assistants. The College of Agriculture Advising Center has assured APEC that sufficient advising capacity exists for ENRE majors. Thus, no additional staff will be required.

Library and Information Resources
No additional library resources are necessary to support the degree. USU’s undergraduate computing facilities will be adequate to serve ENRE majors, and no specialized software will be needed. In the case of a senior project requiring specialized econometric software, APEC will provide access to its graduate computing lab to be located in the College of Agriculture building currently under construction.

Admission Requirements
The admission requirements will be consistent with the existing USU admission requirements. Admission will require a minimum high school grade point average of 2.5 (4.0 = A) accompanied by a score of 18 on the ACT, and 860 on the SAT (not including the writing component), or a 90 index score. Provisional admission may be made following USU admissions policies.

Student Advisement
APEC has a designated advisor housed in the College of Agriculture’s Advising Center. The advisor and Associate Dean in the College of Agriculture have assured APEC that the COA Advising Center has capacity to handle the additional students in the ENRE major.

Justification for Graduation Standards and Number of Credits
The ENRE degree will require 61 credits in its core curriculum, with an additional 14-20 credits for the required natural resources/environment minor or track, summing to 75-81 required credits, with 121 total credits needed for graduation. The core curriculum requirements are very similar to those of APEC’s other undergraduate degrees, which require between 68 and 71 credits.

External Review and Accreditation
The discipline of Economics (and its fields) has no accrediting body. Instead, the former Department of Economics has been periodically reviewed by the USDA. APEC plans to maintain these regular external institutional reviews. According to the USDA, the agency conducts reviews,

…at the request of cooperating institutions, facilitates reviews of institutions, departments, programs, or issues…Institutions identify the purpose, objectives, and scope of the review activity based on their own needs and internal planning processes. Preparation of a forward looking planning document by the reviewed entity is an integral part of the review activity. Generally, the internal review process is followed by an in depth on-site visit by an external team of well qualified peers lasting two or more days, depending on the scope and complexity of the activity as determined by the institution. The external team of reviewers can help the institution project future needs and directions for the reviewed entity for some definitive time frame into the future based on the self-study document and the site visit.¹

¹ http://www.nifa.usda.gov/about/prog_reviews.html
Projected Enrollment

<table>
<thead>
<tr>
<th>Year</th>
<th>Student Headcount</th>
<th>Student-Faculty Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-13</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>2013-14</td>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>2014-15</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>2015-16</td>
<td>18</td>
<td>40</td>
</tr>
<tr>
<td>2016-17</td>
<td>20</td>
<td>42</td>
</tr>
</tbody>
</table>

* Note: The proposed degree will be offered using existing courses. The student:faculty ratio was calculated using numbers from the USU Basic Undergraduate Instruction plus the expected enrollment from the 2010 Department Profile.

Expansion of Existing Program

The proposed degree will require no new courses and thus does not represent an expansion of current programs.

Section III: Need

Program Need

The proposed Bachelor of Science in Environmental and Natural Resource Economics is an undergraduate degree that prepares the student for placement in the workforce or further training in graduate school. The proposed program aims to help improve the quality of life for citizens of Utah and the U.S. with respect to sustainable use of natural resources and protection of environmental quality by making human capital investments necessary to prepare graduates for leadership positions within the private, public and nonprofit sectors.

Labor Market Demand

Evidence of employer need for graduates of the proposed program can be found in a report by Gloecker et al. (2010) entitled “Employment Opportunities for College Graduates in the U. S. Food, Agricultural, and Natural Resources System: 2010-2015”. The report projects 54,400 annual job openings for the foreseeable future. Of the four major factors affecting employment opportunities for graduates of Colleges of Agriculture, two are within the purview of ENRE graduates: “Food, energy, and environment public policy choices” and “Global market shifts in population, income, food, and energy.” Nearly half of the total projected job openings are in management and business occupations, a category that includes environmental and natural resource economists. A substantial shortfall of qualified agricultural and natural resource graduates is expected. The report specifically notes that, “A growing number of managerial jobs will be found in environmental compliance and restoration ecology.” The ENRE curriculum, with its required policy and management or natural sciences minor/track, ensures that graduates will be well-trained as contributors to the pressing needs of the future.

Students graduating with this major may find employment in private firms with environmental compliance and restoration activities or conservation initiatives directed toward energy or other natural resources. Opportunities also exist with consulting firms that assist clients in meeting environmental objectives. Many nonprofit environmental organizations seek to employ staff with economic training. Several federal
government agencies, including the Environmental Protection Agency and the departments of Agriculture, Interior and Energy, employ natural resource and environmental economists. State and local government agencies also provide opportunities for employment. The major provides a strong background for graduate studies in natural resource and environmental economics, leading to career opportunities in teaching and/or research, as well as high-level policy positions. Students would also be well prepared to pursue a professional program in environmental law.

Student Demands
Park (2010) conducted a survey of over 25 economics departments housed in Colleges of Agriculture at land grant institutions. The two departments with the longest-lived ENRE-like programs (University of Georgia and Michigan State University) reported 56 and 41 majors, respectively, in 2009. Park’s survey shows generally growing enrollment trends in the late 2000s across surveyed institutions. The program director at the University of Georgia (UGA) has provided time-series data that shows some mild oscillations in student demand over the years, with oscillations loosely pegged to waxing and waning interest in environmental issues (Bergstrom, 2010).

Similar Programs
There are no similar programs in Utah. In the mountain west, only the University of Arizona offers a similar undergraduate degree (B.S. in Environmental and Water Resource Economics). Colorado State University offers a concentration within its BS-Agricultural Economics degree. No Land Grant institution in the states of Idaho, Nevada, New Mexico, or Montana offers a similar degree. Land Grants institutions in Washington, Oregon, and California each offer a similar degree.

Collaboration With and Impact on other USHE Institutions
No other program similar to ENRE is offered at any USHE institution.

Benefits
Given the importance of public lands, renewable and non-renewable natural resources, and environmental amenities to Utah’s economy, the state will benefit from training its undergraduates in the tools and techniques of efficient management of these resources. A little over half of the U.S. Land Grant institutions already offer a degree or concentration in environmental and natural resource economics, but the proposed degree at USU distinguishes itself from those of its land grant peers because of the required policy or natural sciences minor/track. Not only will ENRE graduates be well-versed in how economists approach management of environmental and natural resources, but also in how state and federal policies or natural scientists approach natural resource management decisions.

Consistency with Institutional Mission
As the state’s land grant institution, Utah State University has a mission in research, teaching, and extension. The goal of the proposed program is to contribute to improving the quality of life for citizens of Utah and the U.S. with respect to sustainable use of natural resources and protection of environmental quality by making human capital investments necessary to prepare graduates for leadership positions within the private, public and nonprofit sectors. This goal is consistent with the mission of Utah State University, the College of Agriculture, and the Department of Applied Economics. The teaching goal of COA and APEC is to prepare students in the natural and social sciences-based academic programs for careers in agriculture, natural resources and other arenas.
Section IV: Program and Student Assessment

Program Assessment
The specific objectives of the proposed program are (1) to challenge students intellectually in their study of natural resource management and environmental policy, (2) to prepare professionals who can apply economic analysis within a multidisciplinary perspective, and (3) to prepare graduates to successfully pursue advanced study in the areas of economics, law and public policy if desired.

Evaluation of the proposed program with regard to the three objectives stated above will be multifaceted and ongoing and will be the responsibility of the APEC Department Head. The degree program will be evaluated as part of the regular external Academic Program Review as designated by the USU Provost’s Office. Student feedback will be solicited in three ways: 1) through evaluations of each departmental course required in the program; 2) through a group senior exit interview held at the end of the spring semester; and 3) through a survey of alumni every five years. Finally, APEC will use the COA Advising Center to track the employment of graduates in the private, public and nonprofit sectors.

Student Performance Standards
Consistent with departmental standards in its other majors, ENRE majors will be required to have an overall major GPA of 2.5 or higher, with a C or better in every required course.

Section V: Finances

Budget
The current request represents a program that requires no new courses. Thus, the APEC Department has already allocated the teaching FTE necessary to meet student numbers associated with the ENRE degree. All figures and footnotes in the Financial Analysis Form presented below have been calculated and written by the USU Budget and Planning Office.

Utah State University
BS in Environmental and Natural Resource Economics

<table>
<thead>
<tr>
<th>Financial Analysis Form for All R401 Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
</tr>
<tr>
<td>Year 1</td>
</tr>
<tr>
<td>Projected FTE Enrollment</td>
</tr>
<tr>
<td>Cost per FTE(^1)</td>
</tr>
<tr>
<td>Student/Faculty Ratio(^2)</td>
</tr>
<tr>
<td>Projected Headcount(^3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Projected Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Tuition(^4)</td>
</tr>
</tbody>
</table>
## 5 Year Budget Projection

<table>
<thead>
<tr>
<th>Expense</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries &amp; Wages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benefits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Personnel</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library Expense</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Expense</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revenue</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislative Appropriation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grants &amp; Contracts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donations</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reallocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuition to Program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Revenue</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Difference</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue - Expenses</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Budget Comments

1. Represents the 2009-10 E&G cost of Basic Undergraduate Instruction in the Department of Applied Economics divided by the 2009-10 AY undergraduate student FTE in Applied Economics plus projected enrollment. Source: 2010 USU Department Profiles.

2. Represents the 2009-10 AY Basic Undergraduate Student FTE in the Department of Applied Economics plus the projected enrollment noted divided by the 2009-10 AY E&G Applied Economics FTE faculty. Source: 2010 USU Department Profiles.

3. The projected number of students in the program each year.

4. The gross tuition generated by the projected headcount enrollment at 15 undergraduate credit hours per semester for an academic year. The figures use the 2011-12 tuition schedule and assume 75% resident and 25% non-resident. Assumed 4% growth in tuition rate each year.

### Funding Sources

The proposal requires no new courses, and will rely upon already allocated E&G funding resources.

### Reallocation
The proposal does not require any reallocation of existing resources within the department.

**Impact on Existing Budgets**

All courses required by this program are currently offered and taught at USU. Therefore, there will be no incremental cost to the APEC Department.
# Appendix A: Program Curriculum

<table>
<thead>
<tr>
<th>Course Prefix/Number</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 2010</td>
<td>Financial Accounting Principles</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 2020</td>
<td>Managerial Accounting Principles</td>
<td>3</td>
</tr>
<tr>
<td>APEC/ECN 201</td>
<td>Intro to Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>APEC 3010</td>
<td>Intro to Agric Economics and Agribusiness</td>
<td>3</td>
</tr>
<tr>
<td>APEC 3012</td>
<td>Intro to Natural Resource and Regional Economics</td>
<td>3</td>
</tr>
<tr>
<td>APEC 3310</td>
<td>Mathematics in Agricultural and Resource Economics</td>
<td>3</td>
</tr>
<tr>
<td>APEC/ECN 4010</td>
<td>Intermediate Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>APEC 5000</td>
<td>Macroeconomics and Trade</td>
<td>3</td>
</tr>
<tr>
<td>APEC 5330</td>
<td>Applied Econometrics</td>
<td>3</td>
</tr>
<tr>
<td>APEC 5560</td>
<td>Natural Resource and Environmental Economics</td>
<td>3</td>
</tr>
<tr>
<td>APEC 5850</td>
<td>Regional and Community Economic Development</td>
<td>3</td>
</tr>
<tr>
<td>ECN 1500</td>
<td>Intro to Economic institutions, History, and Principles</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 3010</td>
<td>Fundamentals of Natural Resource and Environmental Policy</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 3330</td>
<td>Environment and Society</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1050</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1100</td>
<td>Calculus Techniques</td>
<td>3</td>
</tr>
<tr>
<td>MIS 2100</td>
<td>Principles of Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>MIS 2200 or ASTE 3050</td>
<td>Business Communication or Technical and Professional</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Communication Principles in Agriculture</td>
<td></td>
</tr>
<tr>
<td>STAT 2300</td>
<td>Business Statistics</td>
<td>4</td>
</tr>
<tr>
<td>SOC 4620</td>
<td>Sociology of the Environment and Natural Resources</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>61</strong></td>
</tr>
</tbody>
</table>

The policy or natural sciences minor or track will require an additional 14-20 credits (Appendix B). No new courses will be required or are planned for the next five years.
Appendix B: Program Schedule

The following curriculum is required for the Bachelor of Science degree in environmental and natural resource economics (ENRE). Students enrolled in the ENRE major should consult with their advisor to determine which breadth, depth, and elective courses they should complete. ENRE majors are required to complete a minor or track in environmental policy or a natural science. Students should consult with an advisor to develop an individualized plan of study that includes the appropriate minor or track.

### Freshman Year (30 credits)

**Fall Semester (15 credits)**

- **ECN 1500 (BAI)** Introduction to Economic Institutions, History, and Principles
- **MATH 1050 (QL)** College Algebra
- **USU 1010** University Connections
- **USU 1330 (BCA)** Civilization: Creative Arts
- Elective course(s)

**Spring Semester (15 credits)**

- **APEC/ECN 2010 (BSS)** Introduction to Microeconomics
- **ENGL 1010 (CL1)** Introduction to Writing: Academic Prose
- **MATH 1100 (QL)** Calculus Techniques
- **USU 1320 (BHU)** Civilization: Humanities
- Elective course(s)

### Sophomore Year (31 credits)

**Fall Semester (16 credits)**

- **ACCT 2010** Financial Accounting Principles
- **MIS 2100** Principles of Management Information Systems
- **STAT 2300 (QL)** Business Statistics
- **USU 1350 (BLS)** Integrated Life Science
- Elective course(s)

**Spring Semester (15 credits)**

- **ACCT 2020** Managerial Accounting Principles
- **APEC 3010 (DSS)** Introduction to Agricultural Economics and Agribusiness
- **ENVS 3330** Environment and Society
- **ENGL 2010 (CL2)** Intermediate Writing: Research Writing in a Persuasive Mode
- Breadth Physical Sciences (BPS) course
### Junior Year (30 credits)

**Fall Semester (15 credits)**

- **APEC 3012 (DSS)** Introduction to Natural Resource and Regional Economics ................................................. 3
- **APEC 3310 (QI)** Mathematics in Agricultural and Resource Economics ............................................................. 3
- **ASTE 3050 (CI)** Technical and Professional Communication Principles in Agriculture (3 cr) or **MIS 2200 (CI)** Business Communication (3 cr) ........................................... 3
- **ENVS 3010** Fundamentals of Natural Resource and Environmental Policy ................................................................. 3
- **Elective Course** ....................................................................................................................................................... 3

**Spring Semester (15 credits)**

- **APEC/ECN 4010** Intermediate Microeconomics .................................................. 3
- **APEC 5000** Macroeconomics and Trade ........................................................................................................... 3
- **APEC 5560** Natural Resource and Environmental Economics ............................................. 3
- **SOC 4620** Sociology of the Environment and Natural Resources ...... 3
- **Elective course** ....................................................................................................................................................... 3

### Senior Year (27-30 credits)

**Fall Semester (15 credits)**

- **APEC 5850** Regional and Community Economic Development ........................................ 3
- **Depth Humanities and Creative Arts (DHA) course** ............................................................................................... 3
- **Elective courses** ....................................................................................................................................................... 9

**Spring Semester (15 credits)**

- **APEC/ECN 5330 (QI)** Applied Econometrics .................................................. 3
- **APEC 5950** Senior Project ........................................................................ 3
- **Elective courses** ....................................................................................................................................................... 9

---

1The regular calculus series (MATH 1210 and 1220) is recommended for students contemplating graduate studies in economics. MATH 1210 will fulfill the MATH 1100 requirement.
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree/Institution</th>
<th>Field(s) of Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryan Bosworth</td>
<td>Ph.D., University of Oregon</td>
<td>Environmental Economics, Econometrics</td>
</tr>
<tr>
<td>Arthur Caplan</td>
<td>Ph.D., University of Oregon</td>
<td>Environmental Economics</td>
</tr>
<tr>
<td>Paul Jakus</td>
<td>Ph.D., North Carolina State University</td>
<td>Environmental Economics</td>
</tr>
<tr>
<td>Man-Keun Kim</td>
<td>Ph.D., Texas A&amp;M University</td>
<td>Natural Resource Economics, Regional Economics</td>
</tr>
<tr>
<td>Reza Oladi</td>
<td>Ph.D., McGill University</td>
<td>International Trade &amp; Environment</td>
</tr>
<tr>
<td>Charles Sims</td>
<td>Ph.D., University of Wyoming</td>
<td>Natural Resource Economics</td>
</tr>
<tr>
<td>Don Snyder</td>
<td>Ph.D., Utah State University</td>
<td>Natural Resource Economics, Agricultural Production</td>
</tr>
</tbody>
</table>
Appendix D: Recommended Minors/Tracks for ENRE Majors

Department of Environment and Society

Environmental Policy and Management Track (15 credits)

ENVS 4130 - Recreation Policy and Planning
3 credits
Examines the historical, legal, and political context of outdoor recreation policy on public lands; government agency culture, regulation, and partnering; relationship of outdoor recreation to tourism; and theory and application of principal planning tools for outdoor recreation settings.

Semester(s) Traditionally Offered: Spring

ENVS 4000 - Human Dimensions of Natural Resource Management (DSS)
DSS Depth Social Sciences
3 credits
Focuses on balancing science and social values in ecosystem management and decision-making. Topics include environmental justice, communication and behavior change strategies, landscape perception and attitudes, resource-dependent communities, public involvement, and conflict management.

Semester(s) Traditionally Offered: Fall

ENVS 4500 - Wildland Recreation Behavior (CI)
CI Communications Intensive
3 credits
Social, psychological, and geographic influences on human behaviors in wildland recreation settings. Emphasis on critical problems affecting public land recreation management.

Semester(s) Traditionally Offered: Fall

ENVS 5550 - Sustainability: Concepts and Measurement
3 credits
Examines the challenges and opportunities of sustaining resources and ways of life. Develops a global and long-term perspective on concepts of sustainability, challenges, resources, courses of action to become sustainable, and how to measure progress toward sustainability goals.

Cross-listed as: ENVS 6550.

Semester(s) Traditionally Offered: Spring

ENVS 6320 - Water Law and Policy in the United States
3 credits
Introduction to policies, laws, institutions, and practices guiding western water allocation, emphasizing how to efficiently and equitably allocate increasingly scarce supplies. Explores reserved water rights, water markets, stream adjudication, public trust doctrine, basinwide management, and riparian management.

Semester(s) Traditionally Offered: Spring
Department of Watershed Sciences

Watershed Science Minor (16 credits)

**WATS 3700 - Fundamentals of Watershed Science (CI)**

CI Communications Intensive
3 credits
Study of water movement, hillslope processes, and nutrient movement in catchments, and its relevance to the properties, land use, and management of watersheds as natural resource units.

**Semester(s) Traditionally Offered:** Spring

**WATS 4490 - Small Watershed Hydrology**

4 credits
Detailed exploration of concepts of hydrologic processes in small, wildland watersheds. Concentrates on recent research findings concerning key hydrological processes. Particular attention paid to study of partitioning of water in the hydrologic cycle, sources for runoff generation, snow and snowmelt, and erosion. Features process modeling and parameter estimation techniques as related to wildland systems.

**Prerequisite/Restriction:** MATH 1100 or MATH 1210; and WATS 3700.

**Cross-listed as:** WATS 5490.

**Semester(s) Traditionally Offered:** Spring

**WATS 4530 - Water Quality and Pollution**

3 credits
Reviews biological and social problems caused by point and nonpoint source water pollution; toxicology; abiotic and biotic water quality parameters; and use criteria of the Clean Water Act. Graduate-level class will require additional readings of the peer-reviewed literature and an additional class meeting to have in-depth discussions of those readings. Each graduate student will be responsible for making a presentation at the beginning of class, and leading the discussion.

**Cross-listed as:** WATS 6530.

**Semester(s) Traditionally Offered:** Fall

Plus two of the following:

**WATS 3820 - Climate Change (DSC/QI)**

DSC/QI Depth Life and Physical Sciences and Quantitative Intensive
3 credits
Emphasizes physical basis of climate (climate dynamics), as well as the mechanisms and processes for its fluctuations on sub-seasonal to interannual time scales (climate variations) and on regional to hemispheric/global time scales.

**Prerequisite/Restriction:** GEO 1110 or GEOG 1000.

**Cross-listed as:** PSC 3820.

**Semester(s) Traditionally Offered:** Spring

**WATS 4500 - Limnology: Ecology of Inland Waters**

3 credits
Ecosystem analysis of physical, chemical, and biological interactions in lakes and streams. Application of these concepts for managing aquatic system. Graduate students write an additional research paper and present a lecture.

**Prerequisite/Restriction:** CHEM 1210.
**Cross-listed as:** WATS 6500.
**Semester(s) Traditionally Offered:** Spring

---

**WATS 5150 - Fluvial Geomorphology**

3 credits
Focuses on physical processes in streams that control their shape, plan form, slope, bed material, and distribution of channel bars. Emphasizes field analysis of these topics, and application of geomorphology to aquatic ecology and environmental restoration.

**Cross-listed as:** WATS 6150 and GEO 5150/GEO 6150.
**Semester(s) Traditionally Offered:** Fall

---

**WATS 5640 - Riparian Ecology and Management**

3 credits
Explores structure and function of riparian ecosystems and management options for maintaining sustainable ecological function.

**Prerequisite/Restriction:** NR 2220/Biol 2220, WATS 3700.
**Cross-listed as:** WATS 7640.
**Semester(s) Traditionally Offered:** Spring
Department of Wildland Resources  
Ecology Track (20 credits)

BIOL 1610 - Biology I

4 credits
Principles of cell biology, energetics, and genetics; plant structure, function, and development. Three lectures and one lab. To receive University Studies Breadth Life Sciences (BLS) credit, students must complete both BIOL 1610 and either BIOL 1620 or BIOL 3300. The BIOL 1610 and BIOL 3300 option for BLS credit is available only to students majoring in Biological Engineering or Environmental Engineering. The BIOL 1610 and BIOL 3060 option for BLS credit is available only to students in the Bioinformatics Emphasis of the Computer Science Major.  
Semester(s) Traditionally Offered: Fall

BIOL 1620 - Biology II (BLS)

BLS Breadth Life Sciences
4 credits
Animal structure, function, and development; principles of evolution, ecology, and behavior. Three lectures and one lab.  
Prerequisite/Restriction: BIOL 1610.  
Semester(s) Traditionally Offered: Spring

BIOL 2220 - General Ecology

3 credits
Study of the interrelationships among organisms and their environments, addressing where and how organisms live. Adaptation, population growth, species interactions, biodiversity, and ecosystem function are explored for a wide variety of organisms and ecosystems.  
Prerequisite/Restriction: BIOL 1610 and BIOL 1620.  
Cross-listed as: NR 2220  
Semester(s) Traditionally Offered: Fall, Spring

WILD 4600 - Conservation Biology

3 credits
Patterns and processes creating biological diversity. Causes and consequences of diversity losses from genes to ecosystems, including habitat fragmentation and exotic invasion. Conservation laws and organizations. Approaches to conserving diversity loss, including reserve design, corridors, and species reintroductions.  
Prerequisite/Restriction: NR 2220 /BIOL 2220.  
Semester(s) Traditionally Offered: Spring
WILD 4700 - Ecological Foundations of Restoration  

3 credits  
An advanced plant ecology course emphasizing topics especially relevant to successful establishment of plants in disturbed environments and restoration of functioning dynamic ecosystems. It covers basic ecological processes from the population the ecosystem level and applications to ecological restoration.  
Prerequisite/Restriction: NR 2220 or BIOL 2220  
Semester(s) Traditionally Offered: Spring

Choose One of the Following

WILD 4000 - Principles of Rangeland Management  

3 credits  
Modern principles of rangeland management, including history of the profession, ecology, plant physiology, impacts of grazing on individual plants and plant communities, grazing management, range animal nutrition, rangeland watersheds, and the economics and planning of rangeland practices. Also introduces range-wildlife relations and vegetation manipulation.  
Semester(s) Traditionally Offered: Spring

WILD 5300 - Wildlife Damage Management Principles  

3 credits  
Explains current legal, ethical, and biological principles for the control and/or management of problem vertebrate species.  
Cross-listed as: WILD 7300.  
Semester(s) Traditionally Offered: Spring
Appendix E: Letters of Support

Dr. Mark Brunson, Head, Dept. of Environment and Society (converted from PDF)

Dr. Chris Luecke, Head, Dept. of Watershed Sciences (via email)

Dr. Johan DuToit, Head, Dept. of Wildland Resources (via email)
October 14, 2011

Dr. Paul Jakus  
Department of Applied Economics  
Utah State University  

Dear Paul,

I am happy to offer my full support for the proposed Bachelor of Science in Environmental and Natural Resource Economics (ENRE).

As you know, our two departments have been working for some time on ways to build on our respective strengths in environmental/natural resource economics and environmental/natural resource policy. We have designed courses so that they can meet the needs of students in both of our departments, and I see this as degree as a natural extension of our ongoing partnership. I strongly believe it’s in the best interests of both our departments that we can produce graduates who can bring to the workplace an understanding of the economic, social and natural science aspects of environmental/natural resource systems.

Our department will contribute two of the core courses in the ENRE degree, ENVS 3010 and ENVS 3330. We are prepared to adjust the capacity of both courses, if necessary, to ensure there is room for both College of Natural Resources and ENRE majors. Your degree also includes an Environmental Policy and Management track that involves five additional ENVS courses. One of those is presently offered only as a graduate course, and we may have to adjust the curriculum to account for that, but otherwise I see little problem accommodating students in the new major.

I wish you luck with your proposal, and look forward to working with you as the degree progresses toward implementation.

Mark W. Brunson Department Head and Professor
Paul,

The Department of Watershed Sciences enthusiastically endorses the Department of Applied Economics request to establish a new BS degree in Environmental and Natural Resource Economics. Some of the students in this new major will take classes in Watershed Sciences. We have the capacity to provide space for these students. Undergraduate students in existing degree programs in Watershed Sciences will benefit from interactions with students in this new degree program. Exposing Utah State students to economic aspects of natural resource management will benefit these students and the resources of our state.

Chris Luecke
Paul,

Thanks for sharing your proposal for the new BS degree in Environmental and Natural Resource Economics. I support this proposal very strongly. Worldwide, there is an increasing demand in the employment marketplace for economists with a firm academic grounding in ecosystem goods and services. USU is presently not an option for prospective students wishing to become qualified in this important field and so your proposed degree will be an asset to our institution. In particular, I am excited to see the Ecology track in the proposed curriculum because this will facilitate the exchange of students between WILD and APEC, while enhancing the existing collaborations between our respective faculties.

I applaud you for developing this initiative and I look forward to welcoming APEC students into our classrooms. If you need any support as you negotiate the approvals process then please don’t hesitate to call on me.

With best wishes,

Johan

Johan T. du Toit
Professor and Department Head
Department of Wildland Resources
Utah State University
5230 Old Main Hill, Logan, UT 84322-5230, USA
Tel: +1-435-797-2837
E-mail: johan.dutoit@usu.edu
Web: http://www.cnr.usu.edu/wild
References


www.csrees.usda.gov/nea/education/part/education_part_employment.html