Washington State University
MAJOR CURRICULAR CHANGE FORM - - COURSE
(Submit original signed form and ten copies to the Registrar's Office, zip 1035.)

Future Effective Date: 08/01/2013

☐ New course  ☐ Temporary course  ☐ Drop service course
(effective date cannot be retroactive)
☐ There is a course fee associated with this course (see instructions)

☐ Variable credit ________
☐ Increase credit (former credit ________)
☐ Number (former number ________)
☐ Crosslisting (between WSU departments)
(Must have both departmental signatures)

☐ Conjoint listing (400/500)

☐ Request to meet Writing in the Major [M] requirement (Must have All-University Writing Committee Approval)

☐ Request to meet GER in ________ (Must have GenEd Committee Approval)  ☐ Fulfills GER lab (L) requirement

☐ Professional course (Pharmacy & Vet Med only)  ☐ Graduate credit (professional programs only)

☐ Other (please list request)

<table>
<thead>
<tr>
<th>Biology</th>
<th>Community Ecology</th>
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<tr>
<td>course prefix</td>
<td>462/562</td>
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<td>credit</td>
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Descriptive (20 words or less) Assembly, essential properties, levels of interactions, succession,

Instructor: Richard Mack
Contact: Justine Rupp
Campus Zip Code: 4236

Phone number: 335-3316  Email: rmack@wsu.edu
Phone number: 335-8649  Email: ruppj@wsu.edu

- Please attach rationale for your request, a current and complete syllabus, and explain how this impacts other units in Pullman and other branches (if applicable).
- Secure all required signatures and provide 10 copies to the Registrar's Office.

Chair (if crosslisted/interdisciplinary)*
Dean (if crosslisted/interdisciplinary) *
Graduate Studies Com/Date

All-University Writing Com/Date
Academic Affairs Com/Date
Senate/Date

*If the proposed change impacts or involves collaboration with other units, use the additional signature lines provided for each impacted unit and college.
Justification of BIOLOGY 462/562

The proposal for changing the course BIOLOGY 462 “Community Ecology” to BIOLOGY 462/562 arises from a continuing, pressing need to provide graduate instruction in a major level of the organization of life, the biological community. Community Ecology is the only course at WSU that provides comprehensive instruction and analysis on the naturally occurring synergisms (e.g. competition, parasitism, predation and mutualism) by which all organisms interact (e.g. plants, animals, fungi, microorganisms) by drawing on examples from terrestrial, freshwater and marine environments.

This subject has long been within the core training of organismic biology students, and more specifically students in evolutionary biology, ecology and related branches of environmental biology. Before curriculum changes brought about in 2008 under the A2P2 evaluation, Community Ecology had simultaneously and successfully met this need for undergraduate and graduate students through BIOLOGY 462 and BIOLOGY 562, using different exams, assignments and readings but with a common lecture. The proposal here would incorporate recent developments in this discipline with distinctly different course expectations, assignments and goals for BIOLOGY 462 and BIOLOGY 562, reflecting the different needs of undergraduate and graduate students for formal instruction in this discipline.

Undergraduate majors at WSU continue to have the opportunity to gain this information under BIOLOGY 462. Graduate students for whom training in this discipline is essential must either must take the current 400-level course or omit the course because of the need to concentrate the coursework in their degree program on 500-level courses. This situation has created a reverberating loss for their training as BIOLOGY 562 was previously a core requirement for many graduate students in SBS (School of Biological Sciences). More important, not taking a 500-level Community Ecology has prevented these graduate students from gaining the one-on-one instruction in concepts and research consequences in community ecology at a level (i.e., perspective, intensity and rigor) that cannot be feasibly employed in a class for undergraduates (BIOLOGY 462). Course consolidations and deletions in the last 5 years have furthermore left SBS with an inadequate number of inter-connected courses in ecology and evolutionary biology for graduate students, thereby undercutting a strategic goal of SBS – providing comprehensive, integrated training for graduate students in ecology and evolutionary biology (the area of specialization for the largest single fraction of our graduate students’ programs). As society’s legitimate concern for the fate of our environment grows, our graduate students, who are the most graphic illustrations of WSU’s long-term response to this concern, are currently restricted in their training through the lack of a modern course in community ecology as described in the accompanying syllabus.

Creation of BIOL 562 will not require new resources; neither BIOL 462 nor the proposed BIOL 562 includes a laboratory component. BIOL 562 does require a commitment of the instructor (RNM) to working repeatedly with these students one-on-one outside the classroom as they relate and integrate principles of
community ecology into their research paper/proposal - a time commitment which is important to the training of these graduate students.

Requirements for students in BIOLOGY 462 and BIOLOGY 562

The final grade in BIOLOGY 462 will continue to be based on three 1-hr exams plus a final exam. Emphasis in the exams will fall on lecture and the reading assignments (a series of chapter length, full text course notes that I [RNM] have developed and repeatedly revised since 1997 for Community Ecology students at WSU plus questions drawn from the primary literature that will be discussed in lecture. Consequently, students will gain a knowledge of core information in community ecology (from the course notes and lectures) plus an appreciation of the active areas of research in this field from discussion in class of assigned research papers.

While students in BIOLOGY 562 are expected to attend lecture, they will not take 1-hr exams. One third (1/3) of their final grade will however be based on their taking the final (comprehensive) exam in the course. (Composition of the exam will be tailored for these graduate students and emphasize analysis and critical thinking on topics in community ecology as drawn from the course lectures and syllabus).

The remainder (2/3) of the final grade in BIOLOGY 562 will be based on a research paper or grant proposal, the topic of which the students will choose within the first two weeks of the course. The instructor will approve the topic, and much latitude will be granted as to topic and scope of the paper/proposal. The chief criterion for the paper/proposal's selection is that it establishes and integrates clear, solid links through the literature or experimental design to “The community”, i.e., the broadly defined subject of the course. It is expected and encouraged that the topic will relate to the student's current research or plans for future research. [The fine faculty and resources within the Owen Science Library, will be included in this instruction, so that students achieve an understanding of the current multi-faceted tools and opportunities provided by the WSU libraries to facilitate their research and writing.]

BIOLOGY 562 students will submit a paper/proposal outline within the 2nd week of instruction. Emphasis in forming the paper/proposal will be on conceptualizing an important topic, mapping a logical course with relevant literature that synthesizes the issues and their resolution, using clear pathways in critical thinking or problem solving or both. The first draft will be due at the beginning of Thanksgiving vacation. The paper will be edited and a grade assigned (25% of the course grade). The remainder of the final grade (42%) will be based on the accuracy, depth, comprehensiveness developed in the paper/proposal and the quality of scientific writing in this final edition of the paper/proposal. The paper/proposal will be due at the end of classes (week 15). Throughout the semester BIOLOGY 562 students will one-on-one meet with the instructor to gain instruction on framing their topic, searching for and evaluating relevant literature, and repeated one-on-one assistance in writing (e.g. writing with clarity, concisely and with economy of expression,
paragraph construction, syntax, synthesis) their papers/proposals in a style acceptable for a peer reviewed journal (or extramural agency). It is expected that information learned during the semester from lecture and assigned readings will also be reflected in this final product.

An attainable personal goal for BIOLOGY 562 students will be that their paper/proposal can be submitted to a journal or extramural agency at the end of the semester.
Graduate School Questions Regarding Conjoined Courses

1. List the number of faculty in the degree granting area.

   The School of Biological Sciences (SBS) has 30 tenure/tenure track faculty at the Pullman campus, 4 at WSU-V and 1 at WSU-Tri-Cities.

2. List the number of graduate courses listed on the books for the degree granting area.

   SBS teaches 40 classes at the 500 level and four at the 600-800 level. (includes 500, 501, 600, 700, 702, 800). This does not include conjoint courses.

3. How many courses are currently listed as conjoined in the degree granting area?

   4

4. How often are these conjoined courses taught?

   Alternate years

5. How many of these courses are designed as graduate courses with few undergraduates enrolled?

   BIOL 476/576 was originally designed as a conjoint course. BIOL 475/575 was originally designed as a conjoint course. BIOL 469/569 was originally designed as a conjoint course.

   We are not aware of the original intent of Plant Anatomy (BIOL 409/509) but current enrollment is 11 in BIOL 409 and 10 in BIOL 509.

6. Over the past three years, what percentage of courses on Graduate degree programs of study in this degree granting area are conjoined courses?

   9% (4 of 44). None of these courses are required for the majority of SBS graduate students.

7. Why is this particular course integral to the graduate degree granting area?

   Please see “Justification” for the course.
BIOL 462/562 – COMMUNITY ECOLOGY

Lectures: 3 SCH; Fulmer 125, 8:10 AM MWF.

Instructor: Richard N. Mack, Professor, School of Biological Sciences, email: rmack@wsu.edu*; office tel. 335-3316. (See “Your Instructor” section below).

*I attempt to answer course-related email within 24 hrs during weekdays when I am in town. Email received on the weekend will be answered the following Monday.

Text: I have written a series of 12 chapter-length handouts (which will likely be increased during the semester with 1-2 new chapters), which are available to you for downloading on the Angel system as pdfs at no cost throughout the semester. These chapters are not simply out-lines, rather they are full texts with accompanying references, figures, tables and full color photographs. I have tailored these chapters (that could conceivably form a book on community ecology) for students in BIOL 462/562; the chapters explicitly discuss and illustrate much of the information I will present in lecture. Community ecology, as a science, is however always being updated, and I will include new information in lecture as needed, in some cases, new results that only emerged in the primary research literature in the past few months.

Prerequisites: BIOL 106. The prerequisite for BIOL 562 is graduate standing; BIOL 372 (or equivalent) is recommended.

Course objectives (for both BIOL 462/562):

1) Develop a sound, fundamental knowledge of the integrated principles of community ecology with emphasis on clarity of concepts and their application.

2) De-mystify and critically examine the origin, strengths and weaknesses of an array of tools, techniques and protocols from which “the community” is quantified and understood via sampling, experimentation and modeling as underlain by sound principles of hypothesis formation, experimental design and analysis.

3) Develop familiarity with the principle phenomena by which organisms interact, using an array of examples across a diverse selection of communities (terrestrial, freshwater, marine) as drawn from the primary research literature.

4) Critically examine two of the principle drivers of global change (biological invasions and global climate change) as specifically directed at community composition, structure and location.

Course objectives tailored to BIOL 562*

5*) Building on an understanding of “the community” as gained from the achieved goals above, critically evaluate research directly from the primary research literature for soundness of the research questions and hypotheses, the strength of
the experimental design and appropriateness of the conclusions drawn by the investigators.

6*) Using the information and experience gained under (5*) to gain one-on-one training in the construction of a research paper/proposal that casts a specific topic within the broad context of "the community". As a result, gain recurring advice on conceptualizing and framing a scientific argument, searching the world's ecological literature for the relevant citations, synthesizing (and revising) arguments and hypotheses in an iterative process to form a cogent paper/proposal on the chosen topic. Receive repeated one-on-one instruction in writing accurately, concisely and with clarity for a scientific audience.

**Organization of the Course**

I will change the order of lectures to fit the pace of the class, so the lecture sequence that follows is only an approximation. The course will be divided into the six sections or headings in the reading assignments in the 12 chapters (available as pdfs):

**Section 1.**
Chapter 1. The Community; general attributes, principles, "assembly rules" and definitions [7 lectures]

**Section 2.**
Chapter 2. Quantifying communities; introduction to sampling, and assessment of The strengths and weaknesses of some sampling techniques; adequacy of sampling [3 lectures]
Chapter 3. Methods quantifying succession [3 lectures]

**Section 3.**
Chapter 4. Succession; general principles; examples of series [6 lectures]
Chapter 5 Autogenic influences [2 lectures]

**Section 4.**
Chapter 6. Hypothesis formation and evaluation in community ecology. [4 lectures]

**Section 5.**
Chapter 7. Forces that shape and influence the community (basic population biology); competition & allelopathy [5 lectures]
Chapter 8. Forces that shape and influence the community: predation and grazing [3 lectures]
Chapter 9. Forces that shape and influence the community: parasitism [2 lectures]
Chapter 10. Forces that shape and influence the community: mutualisms [1 lecture]

**Section 6.**
Chapter 11 Future of communities: global climate changes [2 lectures]
Chapter 12 Future of communities; invasive species [3 lectures]
I will announce each day the topic for that day's lecture. My overall goal is to acquaint you with the most recent information (or the deficiencies in our information) under each of the five main topics.

**Grading (BIOLOGY 462):**

I plan three 50-minute exams plus a final exam on or about Sept. 26, October 31 and Dec. 9. A final exam (all inclusive of the course material) will be given for BIOLOGY 462 and 562 students, although exams for BIOLOGY 462 and 562 will be tailored to each course, and is scheduled for TH, Dec. 15 at 7 PM. (Specifics on the composition of the final exam for BIOLOGY 462 and BIOLOGY 562 will be given later in the semester.)

The 50-min. exams will probably be a mix of short "objective" type questions (e.g. questions dealing with basic definitions and concepts) and other questions that emphasize the interpretation or synthesis of information given in lecture; these will require somewhat longer answers. A thorough knowledge of the reading assignments and your lecture notes will be essential. Each of the exams, including the final exam, is worth 100 points.

Samples of the longer exam questions on the 50-min. exams are:

1. Refute the statement, "Competition within mixtures is a blunt force that affects equally all individuals of the poorer competitor species."
2. Why are germination tests (in which seeds subjected to an alleged allelopathic agent have less germination than the control) not in themselves valid as an indicator of a toxic effect?
3. Outline the basic problems with using fossil pollen as a guide for reconstructing Quaternary vegetation history.

On other occasions you may be given data in an exam with which you will be asked to analyze and draw conclusions. If you do not understand a question during the exam, ask for an explanation immediately. After the paper is turned in it is too late.

Your exam papers will be graded with the following scale in mind:

100 - 90 = A
89 - 80 = B
79 - 70 = C
69 - 60 = D
59 - = F

There is no curve. However, at the end of the semester there is usually upward adjustment of the grades, depending on the highest total number of points accumulated. There is no "extra credit" or "special makeup projects" in this course. For BIOLOGY 462 students, the course grade is derived from the four exams. An approved makeup exams may be oral exams. The responsibility for arranging for an approved (illness, etc.) makeup exam rests solely with the student. If the student hasn't arranged for a makeup
exam within 2 weeks after missing the exam, a grade of 0 is recorded.

**Your final course grade** will be based on the grand mean of all your exam scores along the usual scale: 100-90 = A, 89-80 = B, 79-70 = C, 69-60 = D, and below 59 = F.

**Grading (BIOLOGY 562)**

Students in BIOLOGY 562 are expected to attend lecture, you will not take the three 1-hr exams. **You will however be required to take a final exam in the course**, which is comprehensive for course material.

One third (1/3) of your final grade will be based on the final (comprehensive) exam in the course (Composition of the exam will be tailored for BIOLOGY 562 students and emphasize analysis and critical thinking on topics in community ecology as drawn from the course lectures and syllabus). The remainder (2/3) of the final grade will be based on a research paper or grant proposal, the topic of which you will choose within the first two weeks of the course. The instructor must approve the topic, but much latitude will be granted as to topic and scope of the paper/proposal. The chief criterion for the paper/proposal’s selection is that it establishes and integrates clear, solid links through the literature or experimental design to “**The community**”, i.e., the broadly defined subject of the course. It is expected and encouraged that the topic will relate to the student’s current research or plans for future research. [The fine faculty and resources within the Owen Science Library will be extensively engaged in this instruction, so that students achieve a understanding of the current multi-faceted tools and opportunities provided by the WSU libraries to facilitate their research and writing.]

You will submit an outline of the paper/proposal within the 2nd week of instruction. Emphasis in forming the paper/proposal will be on conceptualizing an important topic, mapping a logical course with relevant literature that synthesizes the issues and their resolution, using clear pathways in critical thinking or problem solving or both. The first draft will be due by the beginning of Thanksgiving vacation. The paper will be carefully edited and a grade assigned (25% of the course grade). In addition to a further evaluation to the criteria listed above, the remainder of the final grade (42%) will be based on the accuracy, comprehensiveness and level of scientific writing in the final edition of the paper/proposal, which is due at the end of classes (week 15). Throughout the semester you will meet with the instructor to gain advice and instruction on framing your topic, searching for and evaluating relevant literature, and gaining repeated one-on-one assistance in writing (e.g. writing with clarity, concisely and with economy of expression, paragraph construction, syntax, synthesis) in order that your papers/proposals meet a standard by all criteria that is acceptable for a peer reviewed journal (or extramural agency).

*An attainable personal goal would be that your paper/proposal may at the end of the semester to submitted to a journal or extramural agency.*
Your final course grade will be based on the sum of the weighted score from the final exam (33%), the first draft of your paper/proposal (25%) and the second draft (42%) along the usual scale: 100-90 = A, 89-80 = B, 79-70 = C, 69-60 = D, and below 59 = F.

Attendance policy: As you would imagine for a conjointly listed upper division/graduate course, there is no stated attendance policy. Attendance is nonetheless highly recommended not only for the expanded explanation of material in the chapters but for discussions of assigned papers from the primary literature in which their evaluation (dissection and exegesis) will be practiced.

Individual attention (BIOLOGY 462/562): Over the years I have set office hours at various times in the day, but I find that an "open door" policy works best. I'm generally in my office (Heald 319) or lab during the day (unless I am in the field), so if you have a question, just stop by. In addition I will, unless I have an appointment, linger in the classroom after each lecture to answer questions that have arisen that day. I strongly encourage you to come in to see me if you have any questions. You can always make an appointment to see me. Alternatively, you can call me (5-3316) or e-mail me (rmack@wsu.edu) with questions.

Individual attention (BIOLOGY 562 students): In addition to my availability to answer questions that arise from lecture, BIOLOGY 569 students will schedule a series of one-on-one appointments with me through the semester in order to frame and construct their paper/proposal, which is a major component of the course grade (66%). I anticipate that each BIOLOGY 562 student will need to meet with me at least 3 times to effectively write their paper but of course you are welcome to schedule more meetings as needed.

Reasonable Accommodation:

Reasonable accommodations are available for students who have a documented disability. Please notify the instructor during the first week of class of any accommodations needed for the course.

The following is quoted from the WSU statement on reasonable accommodation:

"Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Access Center (Washington Building 217) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center."

Course-specific academic integrity statement: I follow WSU’s stated policies on academic integrity – see http://www.conduct.wsu.edu/default.asp?PageID=343. See in particular the section regarding plagiarism.

WSU safety statement: I have familiarized myself with the procedures I am required to follow as the course instructor in the case of an emergency that requires that we vacate
the classroom building. In the case of BIOLOGY 462 in Fulmer 125, we can most immediately vacate the building through the door at the back of the classroom and then right into the hallway leading directly to the College Ave. Alternatively, we can exit through the classroom side door left into the hallway that exits on Library Rd.


YOUR INSTRUCTOR. Richard N. Mack (Ph.D, Washington State University) is a Professor in the School of Biological Sciences at Washington State University. For approximately the last 30 years his research has been largely devoted to the ecology of invasive species. Much of his research has dealt with the aggressive invader, *Bromus tectorum* (chea-grass or downy brome) in the Intermountain West (USA). He has also investigated plant invasions in Hawaii, the southeastern U.S. and China. He is particularly interested in the population biology (including the immigration, demography, competition, and ecological genetics) of plant invaders and their environmental effects. He has framed much of his research with the goal of addressing applied aspects of combating invasive species, including the prediction of future invasive species and their early detection and eradication.

He served as Chair of the Department of Botany at Washington State University, 1986-1999. He served as Chair from 1999-2001 for the National Research Council's Committee for “Predicting the Invasive Potential of Non-indigenous Plants and Plant Pests in the United States.” He served on the editorial boards of *Ecology & Ecological Monographs*, *Oecologia*, *Ecological Applications* and *Biological Invasions*. He is currently a member of the IUCN (International Union for the Conservation of Nature) specialist group on invasive species and on the editorial boards of *Journal of Ecology*, *Frontiers in Ecology and the Environment* and *NeoBiota*. In spring 2010 he was the recipient of the College of Sciences Distinguished Faculty award.
Hi Cats,

There was a minor error on the Grad School Questions for conjoint Biology 462/562. So attached is the corrected version. We hope that this version also goes to the Grad Studies Committee.

Charlotte
Graduate School Questions Regarding Conjoined Courses

1. List the number of faculty in the degree granting area.

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2. List the number of graduate courses listed on the books for the degree granting area.

   SBS teaches 40 classes at the 500 level and four at the 600-800 level.
   (includes 500,501,600,700,702,800). This includes conjoint courses.

3. How many courses are currently listed as conjoined in the degree granting area?

   4

4. How often are these conjoined courses taught?

   Alternate years

5. How many of these courses are designed as graduate courses with few undergraduates enrolled?

   BIOL 476/576 was originally designed as a conjoint course.
   BIOL 475/575 was originally designed as a conjoint course.
   BIOL 469/569 was originally designed as a conjoint course.

   We are not aware of the original intent of Plant Anatomy (BIOL 409/509) but current enrollment is 11 in BIOL 409 and 10 in BIOL 509.

6. Over the past three years, what percentage of courses on Graduate degree programs of study in this degree granting area are conjoined courses?

   10% (4 of 40). None of these courses are required for the majority of SBS graduate students.

7. Why is this particular course integral to the graduate degree granting area?

   Please see “Justification” for the course.
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