PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF A GRADUATE COURSE
(E0000-60000 LEVEL)

COASCCD#14-29

DEPARTMENT: EWC - Biology
EFFECTIVE SESSION: Spring 2016

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- New course with supporting documents (complete proposal form)
- Add existing course offered at another campus
- Expiration of a course
- Change in course number
- Change in course title
- Change in course credit type
- Change in course attributes
- Change in instructional hours
- Change in course description
- Change in course requisites
- Change in semesters offered
- Transfer from one department to another

PROPOSED:

Subject Abbreviation: BIOL
Course Number: 54110
Long Title: Invasion Biology
Short Title: Invasion Biology

EXISTING:

Subject Abbreviation: 
Course Number: 

TERMS OFFERED:

Check All That Apply
- Fall
- Spring
- Summer

CAMPUS(ES) INVOLVED:
- Calumet
- N. Central
- Cont Ed
- Tech Statewide
- Ft. Wayne
- IUPUI
- VU

ABBREVIATED TITLE WILL BE ENTERED BY THE OFFICE OF THE REGISTRAR AT DISCRETION (50 CHARACTERS ONLY)

CREDIT TYPE:

1. Fixed Credit: Cr. Hrs.
   - 3

2. Variable Credit Range:
   - Minimum Cr. Hrs: To
   - Maximum Cr. Hrs: No

3. Equivalent Credit: Yes
4. Thesis Credit: Yes

COURSE ATTRIBUTES:

1. Pass/No Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
4. Repeatable Credit:
5. Course by Examination
6. Fees

Include comment to explain fee

COASCCD#14-29

COURSE DESCRIPTION (INCLUDE REQUIREMENTS/RESTRICTIONS):

BIOL 54110 Invasion Biology Cr. 3: BIOL 21700 or consent of instructor. The study of species movement, dominance and functional roles within ecosystems, typically related to human interventions. Covers theoretical and applied aspects of species introductions and invasions, including mechanisms, impacts, and management. Taxa include animals and plants in terrestrial and aquatic ecosystems.

COURSE LEARNING OUTCOMES:

Upon completion of the course, students will have gained knowledge and critical thinking skills regarding 1) the introduction and movement of organisms, 2) the processes involved with their establishment, 3) the implications of their spread and success, and 4) human responses to those invasive species, as well as 5) strengthen skills necessary to critically read and discuss relevant scientific literature.

Cross Listed Courses:

Office of the Registrar
(Grad Form 40G [Excel format] - Does not include the Graduate Council's required supporting document. See pdf version of Form 40G)
To: Mark Jordan, COAS Curriculum Committee Chair

From: Frank Paladino, Department of Biology Chair

Date: 15 April 2015

Subject: Re: Request for approval of BIOL 54110 (Invasion Biology) as a new course/number

The request by Jordan Marshall for approval of BIOL 54110 (Invasion Biology) was approved by the Biology Curriculum Committee and the Biology faculty on 15 April 2015.

Attached: Form 40G and supplemental documentation.

[Signature]

Frank V. Paladino
Supporting Document

to accompany the Registrar's FORM 40G when:

1. Requesting a New Graduate Course (Complete Section I) 
or
2. Adding Distance as an Additional Schedule Type (Complete Section II)

To: Purdue University Graduate Council
From: Faculty Member: Jordan Marshall
Department: Biology
Campus: Fort Wayne
Date: 03/16/2015
Subject: Supporting Document to the Registrar's Form 40G

Contact for information if questions arise:
Name: Jordan Marshall
Phone Number: 260-481-6038
E-mail: marshallj@ipfw.edu
Campus Address: SB 330
Course Subject Abbreviation and Number: BIOL 54110
Course Title: Invasion Biology

SECTION I

A. Justification for the Course:

• Provide a complete and detailed explanation of the need for the course (e. g., in the preparation of students, in providing new knowledge/training in one or more topics, in meeting degree requirements, etc.), how the course contributes to existing majors and/or concentrations, and how the course relates to other graduate courses offered by the department, other departments, or interdisciplinary programs.

Ecology of biological invasions provides an avenue for discussing and demonstrating both theoretical and applied biological concepts. Additionally, understanding how species are introduced, spread, and cause impact to ecological and economic systems is important to biology majors (graduate and undergraduate), especially those with career goals in ecology. This course will provide students with further understanding of species interactions, human manipulation of the environment, and consequences of invasion. For graduate students, the course aligns with advanced topics related to ecology and evolution. For undergraduate students, the course will aligns with majors within biology (both general biology and concentration in ecology and evolutionary biology), providing advanced topics beyond organism specific and general ecology.

• Justify the level of the proposed graduate course (50000- or 60000-level) including statements on, but not limited to: (1) the target audience, including the anticipated number of undergraduate and graduate students who will enroll in the course; and (2) the rigor of the course.

The course was taught as a special topics in Spring 2014 (BIOL 59500), and included 3 graduate students and 5 undergraduate students. The target audience is the graduate students interested in ecological aspects of biology. The majority of these students are pursuing the thesis option for M.S. Upper-level undergraduates will also be enrolling in the course. My goal of making this a 50000-level course is specifically to ensure thesis graduate students can enroll and receive credit towards their degree for the course. BIOL 41400 is a similar course that exists at Calumet. However, a 40000-level course would not be accessible to thesis graduate students. Rigor exists in the necessary reading for active discussion, essay exams, writing assignments regarding different species, and presentations by students.
B. Learning Outcomes and Method of Evaluation or Assessment:

- Describe the course objectives and student learning outcomes that address the objectives (i.e., knowledge, communication, critical thinking, ethical research, etc.).

  Overall, students will gain a stronger understanding of invasion biology concepts and processes. Upon completion of the course, students will have gained knowledge and critical thinking skills regarding 1) the introduction and movement of organisms (vectors, pathways, and propagule pressure), 2) the processes involved with their establishment (disturbance, spread, and interactions), 3) the implications of their spread and success (impact intensity and scale), and 4) human responses to those invasive species (prediction and risk assessment, ethics of introductions), as well as 5) strengthen skills necessary to critically read and discuss relevant scientific literature.

- Describe the methods of evaluation or assessment of student learning outcomes. (Include evidence for both direct and indirect methods.)

  All learning outcomes will be assessed through essay exams, writing and presentation assignments, and participation in classroom discussions. Exams will focus on the students' abilities to construct essay answers (with literature citations) to questions regarding the physical and/or ecological barriers to introduction (Exam 1); theoretical and applied models of dispersal and spread (Exam 2); and socio-economic boundaries of definition, discussion, and management (Exam 3). Writing and presentation assignments focus on individual species, including life history, vectors/pathways of introduction, impacts, and management strategies. Class participation focuses on critical analysis and in-depth discussions of the textbook and literature required for reading.

- Grading criteria (select from drop down boxes); include a statement describing the criteria that will be used to assess students and how the final grade will be determined.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Exams and Quizzes</th>
<th>Criteria</th>
<th>Papers and Projects</th>
<th>Criteria</th>
<th>Attendance and Class Participation</th>
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</thead>
</table>

- Identify the method(s) of instruction (select from drop down box) and describe how the methods promote the likely success of the desired student learning outcomes.

<table>
<thead>
<tr>
<th>Method of Instruction</th>
<th>Lecture</th>
<th>Method of Instruction</th>
<th>Recitation</th>
<th>Method of Instruction</th>
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<tr>
<th>Method of Instruction</th>
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<th>Method of Instruction</th>
<th>Recitation</th>
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</table>

C. Prerequisite(s):

- List prerequisite courses by subject abbreviation, number, and title.

  BIOL 21760 Intermediate Ecology

- List other prerequisites and/or experiences/background required. If no prerequisites are indicated, provide an explanation for their absence.

  Consent of instructor

D. Course Instructor(s):

- Provide the name, rank, and department/program affiliation of the instructor(s).

  Jordan Marshall, Assistant Professor, Biology, Fort Wayne

- Is the instructor currently a member of the Graduate Faculty?  ☒ Yes — No

  (If the answer is no, indicate when it is expected that a request will be submitted.)
E. Course Outline:
   - Provide an outline of topics to be covered and indicate the relative amount of time or emphasis devoted to each topic. If laboratory or field experiences are used to supplement a lecture course, explain the value of the experience(s) to enhance the quality of the course and student learning. For special topics courses, include a sample outline of a course that would be offered under the proposed course.

   Each topic will receive equal time and weight in the course.

   Introduction to Invasion, Vectors and Pathways, Invader Numbers, Propagules
   Disturbance, Establishment Success, Modeling Spread, Ecological Processes, Ecological Impacts
   Impact Intensity and Scale, Evolution of Invaders, Prediction and Risk Assessment

   The topics provide a clear sequence, beginning with introduction to terms and broad ideas, to movement of organisms, to establishment, to management, and finally risk assessment and species predictions.

F. Reading List (including course text):
   - A primary reading list or bibliography should be limited to material the students will be required to read in order to successfully complete the course. It should not be a compilation of general reference material.

   The required text for the students is the seminal work by Charles Elton. All other readings will be relevant papers pulled by the instructor from the current literature.


G. Library Resources
   - Describe the library resources that are currently available or the resources needed to support this proposed course.

   The current subscription base available through the library is adequate and will provide the instructor with suitable literature for student reading and discussion.

H. Example of a Course Syllabus (While not a necessary component of this supporting document, an example of a course syllabus is available, for information, by clicking on the link below, which goes to the Graduate School's Policies and Procedures Manual for Administering Graduate Student Programs. See Appendix K.)

BIOL 595 – INVASION BIOLOGY
Syllabus and Tentative Schedules

Instructor: Dr. Jordan Marshall, SB 394, (260) 481-6038, marshallj@ipfw.edu
Lecture: SB G20, MWF 11:00-11:50
Office Hours: TR 9-12 or by appointment

Scope of Course: Invasion biology is the study of species movements, dominance and functional roles within ecosystems, typically in relation to human interventions. The course covers the theoretical and applied aspects of species introductions and invasions, including mechanisms, impacts, and management. Taxa include animals and plants in terrestrial and aquatic ecosystems.

Required Texts

Readings available on Blackboard

Attendance: Attendance of all lecture meetings is required. Any missed assignment deadlines or exams will result in a zero without a make-up opportunity.

Academic Honesty: Academic dishonesty in any form of cheating or plagiarism will not be tolerated.

Species Abstract: Each student must select a unique invasive or non-native species within North America. The preference should be given to species that do not currently occur in Indiana (or in very limited areas) but could be introduced. The species abstract assignment is attached to the syllabus.

Presentation: Each student must select a unique invasive or non-native species and present it to the class. Selected species should not be one used for your Species Abstract, but can be common in Indiana. This will be similar to the Species Abstract in content, but can be more abbreviated. Presentations must include species description (taxonomy, physical characteristics, life history, origin/introduced ranges, and habitat), economic and/or ecological impacts, control efforts, and future issues. Presentations must be developed using primary literature, although some description information will need to come from grey literature. I anticipate presentations will last approximately 20-30 minutes. However, there is no specific time limit/length.

Exams: During the course of the semester there will be 3 exams (@ 100 points each). Exams will be essays and you will have a week to complete them. An acceptable exam will require additional literature and proper citations.

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<thead>
<tr>
<th>Course Points</th>
<th>Grading Scale (Points and Percent)</th>
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<tbody>
<tr>
<td>Exams (3)</td>
<td>A ≥ 720</td>
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<tr>
<td>Lecture Participation</td>
<td>B 640-719</td>
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<tr>
<td>Presentation</td>
<td>C 560-639</td>
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<tr>
<td>Species Abstract</td>
<td>D 480-559</td>
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<td>TOTAL</td>
<td>E &lt; 480</td>
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Extra credit will not be given in this course. Keep up-to-date with deadlines. Please communicate any disabilities to me by the end of the first week of classes so that necessary arrangements can be made.
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<tr>
<th>Week</th>
<th>Topic</th>
<th>Elton</th>
<th>Paper</th>
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<tbody>
<tr>
<td>1/13</td>
<td>Introduction to Invasion</td>
<td>Ch 1</td>
<td>Vitousek et al. 1997, Shea and Chesson 2002</td>
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<td>1/27</td>
<td>Invader Numbers</td>
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<td>Ricciardi 2006, Jackson and Grey 2012</td>
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<td>2/3</td>
<td>Propagules</td>
<td>Ch 3</td>
<td>Lockwood et al. 2005, Nunez et al. 2011, Blackburn et al. 2013</td>
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<td>2/10</td>
<td>Disturbance</td>
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<td>Marshall and Buckley 2008, Besaw et al. 2011</td>
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<td>Exam 1 (2/14)</td>
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<td>2/17</td>
<td>Establishment Success</td>
<td>Ch 4</td>
<td>Levine et al. 2004, Altermi et al. 2010</td>
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<td>3/3</td>
<td>Ecological Processes</td>
<td>Ch 5</td>
<td>Simberloff and Gibbons 2004</td>
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<td>Species Abstract (3/7)</td>
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<td>Exam 2 (3/28)</td>
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<td>4/7</td>
<td>Prediction and Risk Assessment</td>
<td>Ch 8, 9</td>
<td>Gasso et al. 2010, Schmidt and Drake 2011</td>
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<td>4/14</td>
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<td>4/21</td>
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<tr>
<td>5/5</td>
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Assignment: 2