New Course Request

Indiana University

South Bend Campus

Check Appropriate Boxes: Undergraduate credit ☐ Graduate credit ☒ Professional credit ☐

1. School/Division: CLAS
2. Academic Subject Code: BIOL
3. Course Number: 5500 (must be cleared with University Enrollment Services)
4. Instructor:
5. Course Title: Field Exercises for Biology Education
   Recommended Abbreviation (Optional):
   (Limited to 32 Characters including spaces)
6. First time this course is to be offered (Semester/Year): Summer 2007
7. Credit Hours: Fixed at ________ or Variable from ________ to ________
8. Is this course to be graded S-F (only)? Yes ☐ No ☒
9. Is variable title approval being requested? Yes ☐ No ☒
10. Course description (not to exceed 50 words) for Bulletin publication:
    (See attached)

11. Lecture Contact Hours: Fixed at ________ or Variable from ________ to ________
12. Non-Lecture Contact Hours: Fixed at 80 hrs total or Variable from ________ to ________
13. Estimated enrollment: ________ of which ________ percent are expected to be graduate students.
14. Frequency of scheduling: every other yr
15. Justification for new course: No similar course exists
16. Are the necessary reading materials currently available in the appropriate library?
17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.
    (See attached)
18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant. (See attached)
19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

[Signature] Date: 11/6/06

Department Chairman/Division Director

Dean of Graduate School (when required)

[Signature] Date: 12/8/06

 Chancellor/Vice-President

University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

UPS 724 University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White
Biology L509 - Field Exercises for Biology Education (3 cr.)

Summer 2007
Class #XXXX
Lecture/Lab Sundays March 11th, April 1st, May 6th and May 27th, 1:00 - 4:00 PM
Thursdays June 28th - July 12th, 12:30 - 3:30 PM
Field (Belize trip) July 14th - 23rd

Instructors:
Dr. Peter Bushnell
136 Northside
574-520-4888
pbushnell@iusb.edu

Dr. Ann Grens
128A Northside
574-520-4426
agrens@iusb.edu

Course Description and Goals
This is the field component of a linked pair of classes encompassing lecture (L434),
laboratory exercises and field experiences all focused on marine community ecology, intended
for in-service middle school and high school science teachers and graduate students in the School
of Education who hold or are seeking licensure in Secondary Education with certification to
teach Life Sciences or Earth and Space Sciences. Credit is not allowed for this course and
Biology L391 - Special Topics in Biology with the subtitle "Tropical Marine Biology Field
Study".

This course is intended to:
• provide experience performing and developing laboratory and field exercises that
  expose students to marine communities and their inhabitants
• increase the participant's familiarity with the scientific literature, experimental design,
data analysis, and presentation of scientific information in oral and written form
• improve research skills by the development of a research project from initial question
  or concept through analysis and interpretation of the results
• provide participants with the information and opportunity to develop several lesson
  plans for using material from these courses in their own classrooms
• promote collaborative learning and problem-solving by developing and completing
  field-based group research projects

Please note that in order to participate in this course you must be capable of passing a test
of basic swimming proficiency and able to participate in other physically challenging outdoor
activities. Please see the "Physical Demands of the Course" handout distributed with the flyer
for the course for additional information about what exactly will be expected of you, and consult
with one of the instructors if you have any concerns about your ability to complete the field
portion of this class.

Required Texts:
Houghton Mifflin
Houghton Mifflin
**Required Equipment:** see list on page 5

**Assessment and Grading**

Your mastery of the course content and attainment of the course goals will be assessed in a variety of ways. Major activities that will contribute to your course grade will be those related to a research project you will design and conduct, which will collectively make up half your grade, activities related to accurate identification of species inhabiting marine communities, and development of several lesson plans utilizing information from the course and adapting it for use in your classroom. A small portion of your grade will also reflect your participation in all scheduled activities and the instructors' assessment of your demonstrated enthusiasm for science, exploration and scientific inquiry, and learning that is expected of all teachers of science.

There will be two major writing assignments, one of which will a project proposal for your group research project and the other of which will be a formal research paper in the format of a scientific journal article in which you will present and interpret the results of your research project in light of related work in the scientific literature. You will also make two oral presentations, one in which you will present and lead discussion of a scientific article relevant to your research project and the other in which you'll present the findings and conclusions from your project. All assignments related to your group research project will be assessed for clarity, organization, factual accuracy, depth of analysis, evidence of independent synthesis of original results with information from the literature, and adherence to the required form and style appropriate for the presentation of scientific information.

Because a specific goal for this course is the development of lesson plans you can use in your classroom, you will be required to develop 4 different lesson plans on the specified topics indicated below. Each lesson plan will be assessed on the following criteria: identification of specific learning objectives, relevant to state and/or national science education standards; a clear and complete list of required materials and resources; age- or grade-appropriate levels of detail in the instructions to be provided to the students; evidence that the lesson will utilize a variety of modes of instruction and thus be accessible to students with a variety of learning styles; a clear plan for assessment of student learning resulting from the activity or lesson.

The third major component in the assessment of your mastery of the course content will be devoted to identification of inhabitants of marine communities. There will be two objective tests of your ability to accurately identify a variety of marine animals, and a collaborative learning "species identification class project" in which the group as a whole will work together to develop a comprehensive digital collection of the indigenous fauna of Belize coral reef and mangrove communities. Assessment of the species identification class project will reflect individual contributions to the group effort and the overall quality and accuracy of the final collection. This collection may be used in your lesson plans.

Additional instructions for each required component will be provided. The relative value of each component in your final grade will be:

<table>
<thead>
<tr>
<th>Group research project</th>
<th>50%</th>
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<tbody>
<tr>
<td>Reference paper presentation</td>
<td>(10%)</td>
</tr>
<tr>
<td>Project proposal</td>
<td>(10%)*</td>
</tr>
<tr>
<td>Project presentation (in Belize)</td>
<td>(10%)</td>
</tr>
<tr>
<td>Paper</td>
<td>(25%)*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lesson plans</th>
<th>25%*</th>
</tr>
</thead>
<tbody>
<tr>
<td>One each on fish diversity, marine invertebrates, water chemistry/water quality and human impacts on marine environments</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Species identification</th>
<th>15%</th>
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</thead>
<tbody>
<tr>
<td>Species identification class project</td>
<td>(5%)</td>
</tr>
<tr>
<td>Invertebrate identification test</td>
<td>(5%)</td>
</tr>
</tbody>
</table>
Fish identification test (5%)

Attendance and enthusiastic participation 10%
(in all class and field activities, in South Bend and Belize)

*Late proposals, papers or lesson plans will lose 5% of the possible points on that assignment for each day that they are late, and will not be accepted more than one week late.

Tentative Schedule of Lectures and Activities in South Bend

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Topic and/or Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun.</td>
<td>11 March</td>
<td>Introductions, course overview and expectations</td>
</tr>
<tr>
<td>Fri.</td>
<td>30 March</td>
<td>First payment due ($500)</td>
</tr>
<tr>
<td>Sun.</td>
<td>1 April</td>
<td>Set up groups, choose group project topics</td>
</tr>
<tr>
<td>Mon.</td>
<td>30 April</td>
<td>Second payment due ($500)</td>
</tr>
<tr>
<td>Sun.</td>
<td>6 May</td>
<td>Paper presentations for group projects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fish and invertebrates CD distributed</td>
</tr>
<tr>
<td>Sun.</td>
<td>27 May</td>
<td>Project proposal/reference article presentations</td>
</tr>
<tr>
<td>Fri.</td>
<td>1 June</td>
<td>Final Payment due (~$650)</td>
</tr>
<tr>
<td>Thur.</td>
<td>28 June</td>
<td>LAB - Water chemistry</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Research project proposal due</strong></td>
</tr>
<tr>
<td>Thur.</td>
<td>5 July</td>
<td>LAB - Invertebrate identification I; Practice fish and invertebrates quiz</td>
</tr>
<tr>
<td>Thur.</td>
<td>12 July</td>
<td>LAB - Invertebrate Identification II</td>
</tr>
<tr>
<td>Sat.</td>
<td>14 July</td>
<td>Leave for Belize</td>
</tr>
<tr>
<td>Mon.</td>
<td>23 July</td>
<td>Return from Belize</td>
</tr>
<tr>
<td>Fri.</td>
<td>3 August</td>
<td>Research project papers and lesson plans due</td>
</tr>
</tbody>
</table>

Tentative Schedule of Activities in Belize

<table>
<thead>
<tr>
<th>Date</th>
<th>Morning</th>
<th>Afternoon</th>
<th>Evening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday 7/14</td>
<td>Leave for Belize</td>
<td>Arrive Belize</td>
<td>Intro to Belize lecture</td>
</tr>
<tr>
<td>Sunday 7/15</td>
<td>Snorkel Tres Cocos reef</td>
<td>Snorkel &quot;Pillar Coral&quot; patch reefs</td>
<td>Practice invertebrates quiz</td>
</tr>
<tr>
<td></td>
<td>Invertebrate identification¹</td>
<td>Invertebrate identification¹</td>
<td>Project descriptions</td>
</tr>
<tr>
<td>Monday 7/16</td>
<td>Snorkel Mexico Rocks (deep water reef)</td>
<td>Playa Blanca to Mata Rocks drift snorkel</td>
<td>Fish Quiz</td>
</tr>
<tr>
<td></td>
<td>Soft corals project</td>
<td></td>
<td>Invertebrates Quiz</td>
</tr>
<tr>
<td>Tuesday 7/17</td>
<td>Mangroves</td>
<td>Snorkel Tuffy channel Fish diversity project part 1²</td>
<td>Night snorkel at Tres Cocos reef</td>
</tr>
<tr>
<td>Date</td>
<td>Activity</td>
<td>Location</td>
<td>Activity</td>
</tr>
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<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wednesday 7/18</td>
<td>Snorkel Turtle Island and Hol Chan - fish diversity project part 2</td>
<td>Shark/ray alley</td>
<td>Barbecue in town</td>
</tr>
<tr>
<td>Thursday 7/19</td>
<td>Lamanai (tropical forest and Mayan ruin complex)</td>
<td>Lamanai</td>
<td>Night seining</td>
</tr>
<tr>
<td>Friday 7/20</td>
<td>Snorkel Caye Caulker north cut (manatee)</td>
<td>Caye Caulker</td>
<td>Work on projects</td>
</tr>
<tr>
<td>Saturday 7/21</td>
<td>Crooked Tree</td>
<td>Work on projects</td>
<td>Project presentations</td>
</tr>
<tr>
<td>Sunday 7/22</td>
<td>Last chance snorkel</td>
<td>Clean up and pack</td>
<td>End of trip party</td>
</tr>
<tr>
<td>Monday 7/23</td>
<td>Belize Zoo</td>
<td>Leave Belize</td>
<td>Arrive South Bend</td>
</tr>
</tbody>
</table>

Please note that all activities in Belize are weather permitting, and the schedule will be adjusted as necessary to accommodate inclement weather.

1 A list will be provided of ~100 representative organisms that are to be identified by the class as a whole. Each person will be responsible for identifying his or her share of the organisms collected (the precise number will be provided with the list, at the 6 May class meeting), and will be expected to become familiar with the use of field guides and dichotomous keys. Because collecting is not allowed in many areas, identification will rely on a combination of close observation and digital photography.

2 Projects will be partially defined by the instructors and will be chosen by random drawing at the second class meeting. All members of the class will participate in data collection for all projects, but one group will be responsible for designing each project, interpreting the data collected, and presenting the results and conclusions both in an oral presentation in Belize and in a formal written report. Additional information, including instructions for the preparation of project proposals and papers, will be distributed at the second class meeting.

**Equipment (Required):**
- Passport - if you don't already have a passport, please apply for one NOW, as it can take 6-8 weeks for processing. Use your full legal name on your passport, and make sure you give us that name for your airline ticket as well. If the name on the ticket and the name on the passport aren't the same, you won't be able to get on the airplane.
- Snorkel, mask and fins
- Light-weight gloves (cotton garden gloves are fine - you'll want to pick things up under water
without getting stabbed, stung, etc)
Swim suits (at least 2; 3 would be better...putting on a wet swim suit is no fun)
Sunscreen - SPF ≥ 30, waterproof ("Bullfrog Amphibious Sunblock" and "Coppertone Sport" are
two that have worked well in the past)
T-shirt or other cover-up to snorkel in (or a Lycra "skinsuit" if you're particularly fair-skinned or
likely to be allergic to coral/jellyfish stings)
Shorts and/or lightweight pants (2 or 3)
T-shirts or other light-weight tops (remember, this is the tropics; it's hot and humid)
Flip-flops/Tevas/other slip-on footwear to wear around the boat and hotel
Sturdy footwear for the Mayan ruins
Socks (to wear while hiking; also socks to wear with your fins if you have "pocket" rather than
"rocket" style fins and won't be wearing dive boots with your fins)
Sunglasses, hat
Insect repellent
Water bottle or canteen, with a carry strap or belt attachment
Flashlight - preferably waterproof. For night seining, brushing your teeth if the power goes out, etc.
Make sure it has fresh batteries and a working bulb.
4 C-cell batteries (for the underwater spotlights for the night snorkel)
Field guides (see first page - these books are required)
Pens/pencils, notebook, jump drive/memory stick for saving data

Equipment (Optional):
Beach towel - the field station provides small bath towels only
Mesh bag (available in dive shops) - great for carrying your snorkeling gear
Alarm clock - wind-up or battery powered, not plug-in.
Clothespins - for hanging wet swim suits and towels out to dry
Ziplock bags - handy for collecting sea shells and keeping sunglasses and other items dry on the
boat while you're snorkeling
Disposable underwater camera - these work surprisingly well and are much less expensive than
serious underwater photography rigs
Seasickness medication, Benadryl, Solarcaine - if appropriate
Spare glasses or contact lenses if you wear them
Toiletries - the housing at the field site will provide soap and toilet paper, but you need to bring
your own shampoo, toothpaste, etc.
Prescription medication - please bring any medication you take in the original container from the
pharmacy, and bring a typed copy of the prescription with you as well. This will make it
easier to get a refill in Belize if necessary, and will make the DEA inspector happy when
you re-enter the U.S.
Spending money - preferably in small bills. US dollars are accepted for most transactions, and
can be converted into Belize dollars in San Pedro as needed, but you may not get change
for US dollars in US currency. Unless you want a lot of Belize dollars, don't plan on
buying a $2 trinket with a $20 bill. The Belize dollar is fixed to the US dollar at a rate of
BZ$2 = US$1.
Airline regulations allow ONE carry-on bag and two checked bags per person. We may be giving you one suitcase of equipment to check, so please pack everything you are bringing in one bag to check and one bag small enough to meet carry-on restrictions. Please pack your mask and snorkel and one swim suit in your carry-on bag, so that you can go snorkeling on Sunday even if the airline misdirects your checked bag. **DO NOT** pack anything the airport security guards might possibly consider to be a weapon in your carry-on bag; this includes dive knives, razors, pocket knives, corkscrews and any other sharp objects. If a guard finds such an item in your carry-on bag (or your pockets), it **will** be confiscated. As with any travel, do not bring anything that would be heartbroken to come home without. While security at the field station is quite good, a trip like this one creates a multitude of opportunities for you to forget or lose something you brought with you.

**IUSB Academic Policies**

**Withdrawals and Incompletes**

The last day to withdraw from this course and receive a grade of "W" is Monday July 2nd; if you wish to withdraw, all paperwork must be signed and submitted to the Registrar's Office by 5:00 p.m. on this date. After that time, in order to withdraw you must present an "urgent and compelling reason" for withdrawing to the Dean of the College of Liberal Arts and Sciences. Please note that College policy explicitly states that poor performance (ie. a low grade) does **not** constitute an "urgent and compelling" reason and requests to withdraw for that reason are routinely denied. Please also note that if you withdraw you will probably not receive a full refund of all the money you have deposited, as we will have made non-refundable deposits based on the understanding that you would be participating in all aspects of the course - we will refund as much of your money as we can recover. Once we have a purchased an airline ticket in your name, the ticket is non-refundable but can be exchanged for a ticket to a different destination on a different date once you pay a "change fee" to the airline.

The College also has a firm policy on the issuance of a grade of "I" (Incomplete). To receive an Incomplete in this course, you must have completed 75% of the course work and have a passing grade in the course at the time that you request a grade of "I". You must "present evidence of circumstances of hardship, under which it would be unjust to hold a student to the time limits ordinarily fixed for completion of the course work" when you request the "Incomplete". At the time an "Incomplete" is issued an agreement will be reached as to what is required in order for you to complete the course and the time limit within which you must complete the work. Please note that any grade of "I" not completed within one year of issuance will automatically be changed to an "F" by the Registrar's Office.

**Academic Misconduct: Cheating and Plagiarism**

Cases of cheating or plagiarism will be dealt with as described in the Indiana University Academic Handbook and the Code of Student Rights, Responsibilities and Conduct. Cheating includes but is not limited to the use of unauthorized materials or assistance during a quiz or exam, deliberate efforts to obtain information from other students during a quiz or exam (with or without the knowledge or consent of the other students), and possession of a quiz or exam in advance of the scheduled exam period. If you are caught cheating on an exam, you will receive a grade of "F" for the course and the incident will reported to the Vice Chancellor for Student Affairs for notation in your permanent academic record.
While you are welcome to study together and to discuss outside assignments, each student is expected to complete his or her own work; submission of a copy of someone else's work on an assignment is cheating, just as is copying someone else's answers on an exam. Indications of violation of this policy, such as the submission of identical work by two or more students, will result in a score of 0 for the assignment and may, in the case of repeated violations, result in a grade of "F" for the course.

Plagiarism is any submission of written work that is not your own without proper documentation of your sources; this includes but is not limited to submission of the work of another author as your own, submission of information obtained from the Internet without citation of your sources, and submission of work containing text or content/ideas from any other source without citation of those sources. Please note that citing a source is NOT a license to lift text or quote passages verbatim - all written work you submit must be in your own words. Please also note that using an idea that you did not originate without citation is plagiarism just as much as using text written by someone else is, and is in some ways a worse violation of intellectual property rights. If you are found to have plagiarized any assignment, from any source, you will receive a grade of "F" for the assignment, may receive a grade of "F" for the course, and the incident will be reported to the Vice Chancellor for Student Affairs for notation in your permanent academic record. ALL WORK SUBMITTED MUST BE YOUR OWN!

The School of Education may also impose additional penalties or sanctions pursuant to State of Indiana licensure requirements regarding academic integrity.

Accommodation
If you have a disability and need assistance, arrangements can be made to accommodate many needs. Please contact the Office of Disabled Student Services (520-4832, Admin 120B) as soon as possible to work out the details. Before we can make any arrangements for you, we will need to receive official documentation of your disability and the appropriate accommodations from this office.

Please note that in order to participate in this course you must be capable of passing the swim test and able to participate in other physically challenging outdoor activities. If you anticipate that you may be unable to complete a substantial fraction of the course activities, this is not an appropriate class for you; please consult with your academic advisor to withdraw from this course. See the "Physical Demands of the Course" handout for additional information about what exactly will be expected of you.

If you have a non-visible disability that will cause you to need assistance should it be necessary to evacuate the building or take shelter in the basement (for instance, if you are hard of hearing, are subject to panic attacks, or are unable to ascend and descend stairs), please either indicate that in the appropriate space on the student information form distributed in class, or discuss the situation with me outside of class early in the semester.

If you wish to request academic accommodation for a religious observance, please provide me with a written explanation no later than the end of the second class meeting so that we can discuss a reasonable accommodation.
Attachment for L509- Field Exercises for Biology Education

10. Bulletin Copy

Description in IU Bloomington Graduate School Bulletin

L509 Field Exercises for Biology Education (1-5 cr.). L509 is a graduate course for students in
biology and education with an intended career in biology education. Credits are variable (1-5)
and will be arranged. Students will design field exercises based at the Indiana University
Research and Teaching Preserve on topics in organismal biology and ecology appropriate for
public school and other outside groups.

Proposed copy for IU South Bend Bulletin

L509 Field Exercises for Biology Education (3 cr.). Concurrent registration in Marine
Community Ecology (434) required. L509 is a graduate course for students in biology and
education with an intended, or current, career in biology education. Students will collect data
and design field exercises while at the Belize Marine TREC lab on organismal biology and
ecology appropriate for lesson plans in public schools.

18. Course overlap

There is some overlap between this class and the Special Topics: Tropical Marine Biology
in Belize course (L391). However since the participants in this class will be education graduate
students or in-service teachers, the emphasis of the course will not only center around the
different communities, but how the experiences and exercises can be incorporated into their
classrooms when they return.