ENT 509: Biology of Aquatic Insects

In Workflow
1. 11ENT Grad Head (clyde_sorenson@ncsu.edu)
2. 11AE Grad Head (harry_daniels@ncsu.edu)
3. CALS CC Coordinator GR (renutt@ncsu.edu)
4. CALS CC Meeting GR (renutt@ncsu.edu)
5. CALS CC Chair GR (david_ritchie@ncsu.edu)
6. CALS Final Review GR (renutt@ncsu.edu)
7. CALS Dean GR (john_dole@ncsu.edu)
8. jsilver (jules_silverman@ncsu.edu)
9. ABGS Coordinator (george_hodge@ncsu.edu; lian_lynch@ncsu.edu; mlnosbis@ncsu.edu)
10. ABGS Meeting (george_hodge@ncsu.edu; lian_lynch@ncsu.edu; mlnosbis@ncsu.edu)
11. ABGS Chair (george_hodge@ncsu.edu; lian_lynch@ncsu.edu; mlnosbis@ncsu.edu)
12. Grad Final Review (george_hodge@ncsu.edu; lian_lynch@ncsu.edu; mlnosbis@ncsu.edu)
13. PeopleSoft (none)

Approval Path
   Clyde Sorenson (clyde_sorenson): Approved for 11ENT Grad Head
   Harry Daniels (harry_daniels): Approved for 11AE Grad Head
   Robin Clements (renutt): Approved for CALS CC Coordinator GR
4. Mon, 22 Aug 2016 18:02:52 GMT
   Robin Clements (renutt): Approved for CALS CC Meeting GR
   David Ritchie (david_ritchie): Approved for CALS CC Chair GR
6. Mon, 22 Aug 2016 19:30:01 GMT
   Robin Clements (renutt): Approved for CALS Final Review GR
7. Mon, 22 Aug 2016 20:35:12 GMT
   John Dole (john_dole): Approved for CALS Dean GR
   Jules Silverman (jules_silverman): Approved for jsilver
9. Fri, 16 Sep 2016 16:52:58 GMT
   Melissa Nosbisch (mlnosbis): Approved for ABGS Coordinator
    Melissa Nosbisch (mlnosbis): Approved for ABGS Meeting

Date Submitted: Tue, 19 Jan 2016 20:47:08 GMT

Viewing: ENT 509/AEC 509 : Biology of Aquatic Insects

Changes proposed by: jsilver

Formerly Known As: ZO 509

Change Type

Major

Course Prefix
ENT (Entomology)

Course Number
509

Course ID
009081

Dual-Level Course
No

Dual-Level Course Number:

Cross-listed Course
Yes

Cross-listed with Subject Code(s)

Course Prefix:
AEC

Title
Biology of Aquatic Insects

Abbreviated Title
Biology of Aquatic Insects

College
College of Agriculture and Life Sciences

Academic Org Code
Entomology & Plant Pathology (11ENT)

CIP Discipline Specialty Number
26.0702

CIP Discipline Specialty Title
Entomology.

Term Offering
Spring Only

Year Offering

Offered Alternate Odd Years
Specify:

Effective Date
Spring 2017

Previously taught as Special Topics?
No

Number of Offerings within the past 5 years
Course Delivery
Face-to-Face (On Campus)
Remote Location/Site
Grading Method
Graded/Audit
Credit Hours
3
Course Length
16 weeks
Contact Hours
(Per Week)

<table>
<thead>
<tr>
<th>Component Type</th>
<th>Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2.0</td>
</tr>
<tr>
<td>Laboratory</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Course Attribute(s)

Please explain why you selected Service Learning:

If your course includes any of the following competencies, check all that apply.

University Competencies
Course Is Repeatable for Credit
No
Total number of completions allowed including the initial offering.

Maximum total credit hours allowed
Instructor Name
Jules Silverman/Brad Taylor
Instructor Title
Professor/Assistant Professor
Grad Faculty Status
Full
Anticipated On-Campus Enrollment
Open when course_delivery = campus OR course_delivery = blended OR course_delivery = flip

<table>
<thead>
<tr>
<th>Enrollment Component</th>
<th>Per Semester</th>
<th>Per Section</th>
<th>Multiple Sections?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture and Lab</td>
<td>12</td>
<td>12</td>
<td>No</td>
<td>N/A</td>
</tr>
</tbody>
</table>

DELTA/Online Enrollment:
Open when course_delivery = distance OR course_delivery = online OR course_delivery = remote
Course Prerequisites, Corequisites, and Restrictive Statement

Is the course required or an elective for a Curriculum?

No

Which Curricula are Affected?

Catalog Description

Life history descriptions and identification of aquatic insects. Emphasis on behavioral and physiological adaptations to diverse habitats and the role of insects in aquatic ecosystem function and as indicators of water quality. The course includes 3-4 Saturday collecting trips to a local pond and streams in the mountains, piedmont and coastal plain. Collecting trips are not required, but are strongly encouraged.

Justification for each revision:

No revisions - just cross-listed with AEC

Does this course have a fee?

No

List amount and justification for fee:

Is this a GEP Course?

GEP Categories

Humanities Open when gep_category = HUM

Each course in the Humanities category of the General Education Program will provide instruction and guidance that help students to:

List the Instructor's student learning outcomes that are relevant to the GEP Humanities Objective 1:

Obj. 1) Engage the human experience through the interpretation of culture.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/promp is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Humanities Objective 2:

Obj. 2): Become aware of the act of interpretation itself as a critical form of knowing in the humanities.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/promp is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Humanities Objective 3:

Obj. 3) Make academic arguments about the human experience using reasons and evidence for supporting those reasons that are appropriate to the humanities.
Mathematical Sciences
Open when gep_category = MATH
Each course in the Mathematical Sciences category of the General Education Program will provide instruction and guidance that help students to:

List the Instructor's student learning outcomes that are relevant to the GEP Mathematical Sciences Objective 1:
Obj. 1) Improve and refine mathematical problem-solving abilities.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Mathematical Sciences Objective 2:
Obj. 2) Develop logical reasoning skills.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

Natural Sciences
Open when gep_category = NATSCI
Each course in the Natural Sciences category of the General Education Program will provide instruction and guidance that help students to:

List the Instructor's student learning outcomes that are relevant to the GEP Natural Sciences Objective 1:
Obj. O 1) Use the methods and processes of science in testing hypotheses, solving problems and making decisions

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Natural Sciences Objective 2:
Obj. 2) Make inferences from and articulate, scientific concepts, principles, laws, and theories, and apply this knowledge to problem solving.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.
Attach Additional GEP Information if applicable

Social Sciences Open when gep_category = SOCSCI
Each course in the Social Sciences category of the General Education Program will provide instruction and guidance that help students to:

List the Instructor's student learning outcomes that are relevant to the GEP Social Sciences Objective 1:
Obj. 1) Examine at least one of the following: human behavior, culture, mental processes, organizational processes, or institutional processes.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Social Sciences Objective 2:
Obj. 2) Demonstrate how social scientific methods may be applied to the study of human behavior, culture, mental processes, organizational processes, or institutional processes.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Social Sciences Objective 3:
Obj. 3) Use theories or concepts of the social sciences to analyze and explain theoretical and or real-world problems, including the underlying origins of such problems.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

Attach Additional GEP Information if applicable

Interdisciplinary Perspectives Open when gep_category = INTERDISC
Each course in the Interdisciplinary Perspectives category of the General Education Program will provide instruction and guidance that help students to:

List the Instructor's student learning outcomes that are relevant to the GEP Interdisciplinary Objective 1:
Obj. 1) Distinguish between the distinct approaches of two or more disciplines.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.
List the Instructor's student learning outcomes that are relevant to the GEP Interdisciplinary Objective 2:

Obj. 2) Identify and apply authentic connections between two or more disciplines.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Interdisciplinary Objective 3:

Obj. 3) Explore and synthesize the approaches or views of two or more disciplines.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

To assist CUE in evaluating this course for inclusion on the Interdisciplinary Perspectives list, please answer these additional questions.

1. Which disciplines will be synthesized, connected, and/or considered in this course?

2. How will the instructor present the material so that these disciplines are addressed in a way that allows the students "to integrate the multiple points of view into a cohesive understanding"?

Attach Additional GEP Information if applicable

Visual & Performing Arts Open when gep_category = VPA

Each course in the Visual and Performing Arts category of the General Education Program will provide instruction and guidance that help students to:

List the Instructor's student learning outcomes that are relevant to the GEP Visual & Performing Arts Objective 1:

Obj. 1) Deepen their understanding of aesthetic, cultural, and historical dimensions of artistic traditions.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Visual & Performing Arts Objective 2:

Obj. 2) Strengthen their ability to interpret and make critical judgements about the arts through the analysis of structure, form, and style of specific works.
List the Instructor’s student learning outcomes that are relevant to the GEP Visual & Performing Arts Objective 3:
Obj. 3) Strengthen their ability to create, recreate, or evaluate art based upon techniques and standards appropriate to the genre.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/promp is encouraged for clarity.

Attach Additional GEP Information if applicable

Health and Exercise Studies Open when gep_category = HES
Each course in the Health and Exercise Studies category of the General Education Program will provide instruction and guidance that help students to:

List the Instructor’s student learning outcomes that are relevant to the GEP Health & Exercise Studies Objective 1:
Obj. 1) Acquire the fundamentals of health-related fitness, encompassing cardio-respiratory and cardiovascular endurance, muscular strength and endurance, muscular flexibility and body composition.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/promp is encouraged for clarity.

List the Instructor’s student learning outcomes that are relevant to the GEP Health & Exercise Studies Objective 2:
Obj. 2) Apply knowledge of the fundamentals of health-related fitness toward developing, maintaining, and sustaining an active and healthy lifestyle.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/promp is encouraged for clarity.

List the Instructor’s student learning outcomes that are relevant to the GEP Health & Exercise Studies Objective 3:
Obj. 3) Acquire or enhance the basic motor skills and skill-related competencies, concepts, and strategies used in physical activities and sport.

&

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/promp is encouraged for clarity.
List the Instructor's student learning outcomes that are relevant to the GEP Health & Exercise Studies Objective 4:

Obj. 4) Gain a thorough working knowledge, appreciation, and understanding of the spirit and rules, history, safety, and etiquette of physical activities and sport.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

Attach Additional GEP Information if applicable

Global Knowledge Open when gep_category = GLOBAL
Each course in the Global Knowledge category of the General Education Program will provide instruction and guidance that help students to achieve objective #1 plus at least one of objectives 2, 3, and 4:

List the Instructor's student learning outcomes that are relevant to the GEP Global Knowledge Objective 1:

Obj. 1) Identify and examine distinguishing characteristics, including ideas, values, images, cultural artifacts, economic structures, technological or scientific developments, and/or attitudes of people in a society or culture outside the United States.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

Please complete at least 1 of the following student objectives.

List the Instructor's student learning outcomes that are relevant to the GEP Global Knowledge Objective 2:

Obj. 2) Compare these distinguishing characteristics between the non-U.S. society and at least one other society.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Global Knowledge Objective 3:

Obj. 3) Explain how these distinguishing characteristics relate to their cultural and/or historical contexts in the non-U.S. society.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

List the Instructor's student learning outcomes that are relevant to the GEP Global Knowledge Objective 4:

Obj. 4) Explain how these distinguishing characteristics change in response to internal and external pressures on the non-U.S. society.

Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.
Each course in the US Diversity category of the General Education Program will provide instruction and guidance that help students to achieve at least 2 of the following objectives:
Please complete at least 2 of the following student objectives.

List the Instructor's student learning outcomes that are relevant to the GEP U.S. Diversity Objective 1:
Obj. 1) Analyze how religious, gender, ethnic, racial, class, sexual orientation, disability, and/or age identities are shaped by cultural and societal influences.

List the Instructor's student learning outcomes that are relevant to the GEP U.S. Diversity Objective 2:
Obj. 2) Categorize and compare historical, social, political, and/or economic processes producing diversity, equality, and structured inequalities in the U.S.

List the Instructor's student learning outcomes that are relevant to the GEP U.S. Diversity Objective 3:
Obj. 3) Interpret and evaluate social actions by religious, gender, ethnic, racial, class, sexual orientation, disability, and/or age groups affecting equality and social justice in the U.S.

List the Instructor's student learning outcomes that are relevant to the GEP U.S. Diversity Objective 4:
Obj. 4) Examine interactions between people from different religious, gender, ethnic, racial, class, sexual orientation, disability, and/or age groups in the U.S.
Measure(s) for the above outcome(s): Describe the assessments that will be used to determine if students have achieved the outcome. Including a relevant example assignment/question/prompt is encouraged for clarity.

Attach Additional GEP Information if applicable

Requisites and Scheduling
What percentage of the seats offered will be open to all students?

a. If seats are restricted, describe the restrictions being applied.

b. Is this restriction listed in the course catalog description for the course?

List all course pre-requisites, co-requisites, and restrictive statements (ex: Jr standing; Chemistry majors only). If none, state none.

List any discipline specific background or skills that a student is expected to have prior to taking this course. If none, state none. (ex: ability to analyze historical text; prepare a lesson plan)

Additional Information
Complete the following 3 questions or attach a syllabus that includes this information. If a 400-level or dual level course, a syllabus is required.

Title and author of any required text or publications.

Major topics to be covered and required readings including laboratory and studio topics.

List any required field trips, out of class activities, and/or guest speakers.

Consultation

Instructional Resources Statement
Taught in classroom. No special resources required

Course Objectives/Goals
This course will introduce the student to the identification and life histories of aquatic insects, with an emphasis on the ways in which insects are adapted to diverse aquatic habitats. Students will also learn the significance of aquatic insects in ecosystem functioning and as indicators of water quality.

Student Learning Outcomes
By the end of this course, the students will be able to:

Differentiate between the major families of aquatic insects.

Explain how the life history characteristics of each aquatic insect family allow for survival in an aqueous environment

Demonstrate how eco-physiological characteristics of aquatic insects are adaptive.

Define the various physical characteristics of bodies of water and describe their roles in supporting aquatic insect development.

Describe how aquatic insects are used as bio-assessment tools

Student Evaluation Methods

<table>
<thead>
<tr>
<th>Evaluation Method</th>
<th>Weighting/Points for Each</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>20%</td>
<td>Lecture exams (2)</td>
</tr>
</tbody>
</table>
Quizzes 36%  Lab quizzes (12)
Oral Presentation 14%  Paper discussions (1 or 2)
Final Exam 15%  Final Exam – paper
Project 15%  Insect collection

Topical Outline/Course Schedule

<table>
<thead>
<tr>
<th>Topic</th>
<th>Time Devoted to Each Topic</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to aquatic insects. Course overview and expectations.</td>
<td>1 week</td>
<td>Lecture - course expectations - lecture. Lab - Insect orders</td>
</tr>
<tr>
<td>Phylogeny and evolution of aquatic insects</td>
<td>1 week</td>
<td>Lecture - Ephemeroptera - Lab</td>
</tr>
<tr>
<td>Lotic and lentic habitats</td>
<td>2 weeks</td>
<td>Lecture - Ephemeroptera Odonata - lab</td>
</tr>
<tr>
<td>Functional feeding groups</td>
<td>1 week</td>
<td>Lecture - Plecoptera - lab</td>
</tr>
<tr>
<td>Nutrient cycling in streams</td>
<td>2 weeks</td>
<td>Lecture - Hemiptera- lab</td>
</tr>
<tr>
<td>Megaloptera, Neuroptera, Lepidoptera</td>
<td>1 week</td>
<td>Megaloptera, Neuroptera, Lepidoptera, Hymenoptera lecture and lab</td>
</tr>
<tr>
<td>Coleoptera</td>
<td>1 week</td>
<td>Coleoptera - lecture and lab</td>
</tr>
<tr>
<td>Respiration</td>
<td>2 weeks</td>
<td>Lecture - Trichoptera - lab</td>
</tr>
<tr>
<td>Osmoregulation</td>
<td>1 week</td>
<td>Lecture - Trichoptera - Lab</td>
</tr>
<tr>
<td>Aquatic insects in temporary waters</td>
<td>2 weeks</td>
<td>Lecture - Diptera - Lab</td>
</tr>
<tr>
<td>Bioassessment of water quality</td>
<td>2 weeks</td>
<td>Lecture</td>
</tr>
</tbody>
</table>

Syllabus
ENT_AEC_509 Syllabus Spring 2017 (1).doc

Additional Documentation

Additional Comments

Course will remain the same, just cross listed

minosbis 8/23/2016: Suggest consultation with College of Sciences (Jo-Ann Cohen, cohen@ncsu.edu) because this action removes the ZO cross-list. See correspondence below

Jules Silverman <jsilver@ncsu.edu>
3:43 PM (21 hours ago)
to cohen, Melissa
Dear Dr. Cohen,

ENT 509, Biology of Aquatic Insects, was formerly cross-listed with ZO when ZO was part of CALS. I am submitting a course action to cross-list with AEC, since the class will now be co-taught with Dr. Brad Taylor of AEC. I was told that I need to include a statement from you in the CIM Approver indicating that you are aware of, and okay with, dropping ZO from the cross-listing. Would you please provide me with such a statement?

Jo-Ann Cohen
4:24 PM (20 hours ago)
to Gerald, me, Melissa
Jules, I am copying Jerry LeBlanc, head of Bio Sci. Jerry is in a better position to evaluate your request.
Jerry, please let us know if Bio Sci is ok with the proposed action.

Jo-Ann

Sent from my iPad

Gerald LeBlanc <gal@ncsu.edu>
5:19 PM (19 hours ago)
to Jo-Ann, me, Melissa
I am ok with this request.

Jerry

ghodge 9/23/2016. Agree, consultation needed. Student learning outcomes (understand, know) are not measurable; please edit. Done

Syllabus needs to be updated (see syllabus checklist). Add #3 student learning outcomes. Are any textbooks required? (#4). Do student provided their own transportation for field trips (#8)? Are there any safety issues with the field trips (#9)? Add statements #13 and # 14. Done

mlnosbis 8/25/2016: Problem attaching syllabus. Waiting for CourseLeaf to resolve, then I will attach the updated syllabus.

mlnosbis 9/16/2016: Syllabus attached.

ABGS Reviewer Comments:
-No concerns

Justification for this request

Course Reviewer Comments

Key: 2469

Preview Bridge