**Eastern Illinois University**

# New/Revised Course Proposal Format

**(Approved by CAA on 4/3/14 and CGS on 4/15/14, Effective Fall 2014)**

CGS Agenda Item: 17-102
Effective Fall 2018

**Banner/Catalog Information**

1. **__X__New Course or _____Revision of Existing Course**
2. **Course prefix and number:** _BIO 5630_____
3. **Short title:** __Advanced Evolutionary Medicine_____
4. **Long title:** Advanced Evolutionary Medicine_____
5. **Hours per week:** _4__ Class _0__ Lab _4__ Credit
6. **Terms:** ___ Fall ___ Spring ___ Summer __X_ On demand
7. **Initial term**: _X__ Fall ___ Spring ___ Summer Year: _2018_

**Catalog course description:**

An in-depth and critical exploration of the theoretical underpinnings, foundational research, conclusions and emerging fields in evolutionary medicine focusing on case studies, primary data, online interactive sessions with worldwide experts, published literature, and on-going research.

**Course attributes:**

General education component: N/A_____

___ Cultural diversity ___ Honors ___ Writing centered ___ Writing intensive ___Writing active

8. **Instructional delivery**

**Type of Course:**

_X_ Lecture ___ Lab ___ Lecture/lab combined ___ Independent study/research

___ Internship ___ Performance ___ Practicum/clinical ___ Other, specify: _____

**Mode(s) of Delivery:**

_X__ Face to Face __ Online ___ Study Abroad

___ Hybrid, specify approximate amount of on-line and face-to-face instruction_____

9. Course(s) to be deleted from the catalog once this course is approved. _____**NONE**_____
10. **Equivalent course(s):** __**NONE**_____

    a. **Are students allowed to take equivalent course(s) for credit?** ___ Yes __X No

11. **Prerequisite(s): BIO 3180 or BIO 4984 or permission of the instructor**

    a. **Can prerequisite be taken concurrently?** ___ Yes __X_ No

    b. **Minimum grade required for the prerequisite course(s)? ___**

**c. Use Banner coding to enforce prerequisite course(s)?** ___ Yes _X__ No

**d. Who may waive prerequisite(s)?**

___ No one __X_ Chair _X__ Instructor ___ Advisor ___ Other (specify)

**12. Co-requisite(s):** __**NONE**_____

**13. Enrollment restrictions**

**a. Degrees, colleges, majors, levels, classes which may take the course:** Admission to the Graduate School or by permission of the Department Chair._____

**b. Degrees, colleges, majors, levels, classes which may not take the course:** ? None

**14. Repeat status:** __X_ May not be repeated ___ May be repeated once with credit

**15. Enter the limit, if any, on hours which may be applied to a major or minor:** ___

**16. Grading methods:** __X_ Standard ___ CR/NC __ Audit ___ ABC/NC

**17. Special grading provisions:**

___ Grade for course will not count in a student's grade point average.

___ Grade for course will not count in hours toward graduation.

___ Grade for course will be removed from GPA if student already has credit for or is registered in: _____

__X_ Credit hours for course will be removed from student's hours toward graduation if student already has credit for or is registered in: _BIO 5460E (Special Topics in Advanced Evolutionary Medicine; CRN# 33733)

**18. Additional costs to students:**
Supplemental Materials or Software_____

Course Fee _X__No ___Yes, Explain if yes_____

**19. Community college transfer:**

___ A community college course may be judged equivalent.

__X_ A community college may not be judged equivalent.

Note: Upper division credit (3000+) will not be granted for a community college course, even if the content is judged to be equivalent.

**Rationale, Justifications, and Assurances (Part I)**

1. ___Course is required for the major(s) of _____
   ___Course is required for the minor(s) of _____
   ___Course is required for the certificate program(s) of _____
   __X_ Course is used as an elective
2. **Rationale for proposal** : Advanced Evolutionary Medicine provides an opportunity to delve into the use of evolutionary theory in human health, an emerging field in human health practice and research. A large population of post-baccalaureate students within the COS graduate program are prehealth students seeking graduate studies prior to entrance into a professional healthcare program. Advanced Evolutionary Medicine provides a novel avenue for graduate students to demonstrate understanding of an important, emerging topic in many medical schools, nursing programs, etc. Courses such as Advanced Evolutionary Medicine are only available in a small number of institutions. Advanced Evolutionary Medicine will also offer novel direct exposure to experts in the field of Evolutionary Medicine through topic focused, real-time, "virtual" seminars, allowing our students to pose research-based critiques and engage in discussion with the professional population outside of EIU.
3. **Justifications for (answer N/A if not applicable)**

   Similarity to other courses:

   Evolutionary theory is the organizing principle of study within the Biological Sciences; as such, mechanics of evolution (e.g., natural selection, genetic drift, etc.) are a common thread in most courses within biology. Advanced Evolutionary Medicine overlaps in the acknowledgement of such processes with BIO 4984 Organic Evolution, which stresses "historical facts in evolution, evidence for and processes in common to all biota". The application of these mechanisms and processes to human biology and health differs from the more general and widespread treatment of the entire field of organic evolution. Evolutionary Medicine (BIO 3988) is similar to the proposed course insofar as fundamental concepts. BIO 5630, however, uses these fundamentals to critically examine theoretical underpinnings, case studies and primary data. This course also engages graduate students in cutting-edge research through interactive sessions with worldwide experts.

   Prerequisites: The prerequisites (BIO 3180 or BIO 4984) introduce general evolutionary processes and vocabulary.

   Co-requisites: None

   Enrollment restrictions:

May not have previously taken BIO 5460-E (CRN# 33733). The proposed course was offered as a special topics course, Evolutionary Medicine (BIO 5460-E) in Spring 2017 and Spring 2018.

Writing active, intensive, centered: N/A

**4. General education assurances (answer N/A if not applicable)**

General education component:

N/A.

Curriculum:

N/A

Instruction: N/A

Assessment: N/A

**5. Online/Hybrid delivery justification & assurances (answer N/A if not applicable)**

Online or hybrid delivery justification: N/A

Instruction: N/A

Integrity: N/A

Interaction: N/A

Model Syllabus (Part II)

1. Course number and Title: BIO 5630/Advanced Evolutionary Biology
2. Catalog Description: An in-depth and critical exploration of the theoretical underpinnings, foundational research, conclusions and emerging fields in evolutionary medicine focusing on case studies, primary data, online interactive sessions with worldwide experts, published literature, and on-going research.

3. Graduate Goals for Learning
   - G1. Depth of content knowledge
   - G2. Effective critical thinking and problem solving
   - G3 Effective oral and written communication
   - G4. Advanced scholarship through research or creative activity

   Learning Objectives - Graduate Learning Goals Met:
   1. Integrate theoretical predictions made by evolutionary theory with evidence from case studies and large data sets available to assess and critique conclusions (G1, G2, G3)
   2. Demonstrate an in-depth understanding of the emerging areas of evolutionary medicine examined in the course. (G1, G3)
   3. Evaluate human health issues where an evolutionary perspective may be novel or effective and use reasoned assessment. (G1, G2, G3)
   4. Interact with experts in the field of evolutionary medicine; comprehend and evaluate published research in the context of topical areas in Evolutionary Medicine (G1, G2)

4. Course materials:
   Stearns S.C. and R. Medzhitov. 2016. Sinauer Associates, Inc.; Primary literature from

varied peer-reviewed sources such as the journal "Evolution, Medicine and Public Health."

5. Weekly Outline of Content

| Week | Content |
|---|---|
| 1 | Introduction: Evolution terms, concepts and foundational research specifically useful in the application of evolutionary theory to questions in human health; introduction to population-level and phylogenetic analyses. HW1 for Discussion #1 |
| 2 | Variation in human populations and humans as patients: life history theory, plasticity and reaction norms; Discussion #1; HW2 - Case study analysis #1 |
| 3 | Variation in human populations and humans as patients: trade-offs and evolution theory of trade-offs, compensatory mutation; emerging research; HW3 analysis of readings for seminar #1 speaker's research/practice; preparing for dialogue. Discussion #2 Case study analysis |
| 4 | Hypotheses on the developmental origins of health and disease; emerging hypotheses; HW4 Approaches to comparative analysis- data set #1 assignment<br><br>Virtual Seminar # 1 |
| 5 | Evolution of Diseases and Defenses emerging trends in research; HW5 for Discussion # 3 |
| 6 | Evolution of Diseases and Defenses emerging trends in research; Discussion # 3; Analysis of dataset # 1 due. |
| 7 | Midterm; Pathogen Evolution trade-offs; HW # 6 analysis of readings on seminar speaker's research/practice; preparing for dialogue |
| 8 | Emerging Research in Cancer Evolution HW7 - Case study analysis #2<br>Virtual Seminar # 2 |
| 9 | Evolutionary Approaches to Cancer Treatment; Reproductive Medicine HW8 data set # 2 assigned; Discussion 4 - Case Study #2 |
| 10 | Hypotheses of the Evolutionary trade-offs in reproduction, genomic imprinting, parent-offspring conflict; HW#9 for discussion #5 |
| 11 | Emerging research on Dysevolution (e.g., diseases of modernity); Discussion #5 -HW #9 HW10 analysis of readings for seminar #3 speaker's research/practice; preparing for dialogue |
| 12 | Emerging research on Dysevolution (e.g., diseases of modernity) HW11 Case study #3 Virtual Seminar # 3 |
| 13 | Emerging research on Dysevolution (e.g., diseases of modernity) HW12 Analysis of dataset # 3, Discussion #6 - Case Study #3 |
| 14 | Cost and consequences of individual versus population health choices; comparison to natural selection; Discussion #7 |
| 15 | Open-ended questions in emerging research; Discussion # 8; Term Paper Critique and Analysis of Topical EV Med research due |
| 16 | Final Exam |

**6.** Assignments and evaluation, including weights for final course grade

Preparation for class based on assigned readings; in-class work; substantive contributions to discussion = 5%
Assigned Homework (discussion analyses, case studies, data analyses, etc.) = 30%
Virtual Seminar preparations = 15%
Midterm Exam = 20%
Term paper = 15%
Final Exam = 15%

**7.** Grading scale: A = 90 to 100%, B = 80 to 89%, C = 70-79%, D = 60-69% F = < 60%

**8.** Correlation of learning objectives to assignments and evaluation:

| Learning Objectives & Graduate Learning Goals (see Part II.3) | Discussions, Case-studies, data analysis, Homework (35%) | Topical Research & Critical Analysis for virtual seminars with experts/practitioners in Evolutionary Medicine (15%) | Analysis and Critique of Topical Research - Term paper (15%) | Midterm & Final Exam (35%) |
|---|---|---|---|---|
| 1. Depth of content knowledge (G1, G2, G3) | X | | X | X |
| 2. Effective critical thinking and problem solving (G1, G3) | X | X | X | X |
| 3. Effective oral and written communication (G1, G2, G3) | X | X | | X |
| 4. Advanced scholarship through research or creative activity(G1, G2) | X | X | X | |

**Date approved by the department or school:** October 27, 2017
**Date approved by the college curriculum committee:** November 10, 2017
**Date approved by the Honors Council** ***(if this is an honors course):***
**Date approved by CAA: CGS:**