

BIOLOGY DEPARTMENT **COURSE DESCRIPTIONS - SPRING 2014**

UNDERGRADUATE COURSES

Biology 123 General Biology II (3 credits) Wiles & Staff

Lecture - Monday AND Wednesday 12:45-2:05 pm OR 3:45-5:05 pm Giff Aud

Course Description: The second of a two-course sequence comprising a survey of major biological concepts ranging from the molecular level to global ecology. Units within Biology 123 include biodiversity, plant structure and function, human and comparative animal anatomy and function, ecology, and evolution, which is the central and unifying concept of biology and the framework around which the understanding of other concepts in this course is constructed.

Required Materials:

Textbooks: Campbell Biology General Biology I and II, Custom Edition for Syracuse University ISBN-13978-1-256-31055-6.

Exams: 4 per semester (3 during semester, 1 during final exam week); multiple choice; essays, quizzes, papers and reports in lab/recitation section.

Class size: 750 limit

Frequency of Offering: Each Spring semester

Biology 124 General Biology II Laboratory (1 credit) Wiles & Staff

Students registered for Bio 124 MUST also register for Bio 123.

Course Description: Laboratory course associated with BIO 123. Includes inquiry-based exploration and practical application of concepts discussed in BIO 123. One laboratory session per week.

Required Materials:

Textbooks: Campbell Biology General Biology I and II, Custom Edition for Syracuse University ISBN-13978-1-256-31055-6.

Class size: 24 students per section, (384 in total)

Frequency of Offering: Each Spring semester

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| <u>Biology 217</u> | Anatomy & Physiology II | (4 credits) | Sweet |
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| Lecture section: | 001 | MW | 12:45-2:05 | 001 LSC |
| Lab sections: | 002 | T | 8:00-10:00 | 308 LSC |
| | 003 | T | 10:20-12:20 | 308 LSC |
| | 004 | W | 8:00-10:00 | 308 LSC |
| | 008 | W | 10:35-12:35 | 308 LSC |
| | 010 | W | 3:45-5:45 | 308 LSC |
| Recitation sections: | 005 | M | 8:00-9:20 | 300 LSC |
| | 006 | Th | 5:00-6:20 | 300 LSC |
| | 007 | F | 12:45-2:05 | 300 LSC |
| | 009 | Th | 5:00-6:20 | 214 LSC |
| | 011 | F | 12:45-2:05 | 214 LSC |

Course Description: A continuation of the BIO 216 lecture and laboratory course studying the structure and function of human tissues, organs and systems. The endocrine, respiratory, cardiovascular, digestive and reproductive systems and metabolism and energetics will be covered. Laboratories will include bench top and interactive computer experiments, anatomy, histology and non-invasive experiment on human subjects.

This course cannot be used to fulfill the requirements toward a biology major.

Textbooks: Seeley's Anatomy & Physiology, Van Putte, Regan & Russo, 9th Ed.

Prerequisites: Bio 121-123 or equivalent

Examinations: Midterm & Final, plus weekly quizzes

Class size: 96

Frequency of Offering: Spring semesters

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| <u>Biology 300</u> | Research Methods for Life Scientists | (3 credits) | Dash |
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| TTH | 12:30-1:50 | 105 LSC |
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Course Description: All disciplines of life sciences require the ability to examine, analyze, and ultimately interpret experimental data. This introductory course will cover both theoretical and practical foundations underlying the logic and methods of research within the life sciences, focusing on study design, data interpretation, and the power of conclusions. Additional topics will include aspects of research integrity, considerations in the use of animals or human subjects in research, as well as some common statistical methods encountered in life sciences applications.

Prerequisite: Biology 121

Textbook(s): TBA

Biology 305 Integrative Biology Lab (3 credits) Maine/Lewis/Ritchie

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| 001 Lecture | M | 10:35-12:05 | 001 LSC |
| 002 Lab | T | 12:30-4:30 | 146 LSC |
| 003 Lab | T | 12:30-4:30 | 148 LSC |
| 004 Lab | W | 12:45-4:45 | 146 LSC |
| 005 Lab | W | 12:45-4:45 | 148 LSC |
| 006 Lab | Th | 12:30-4:30 | 146 LSC |
| 007 Lab | Th | 12:30-4:30 | 148 LSC |
| 008 Lab | F | 12:45-4:45 | 146 LSC |
| 009 Lab | F | 12:45-4:45 | 148 LSC |

Course Description: Provides students with early laboratory experience, presenting a quantitative, integrated view of subcellular, cellular, developmental, organismal, and ecosystem/environmental perspectives on biology.

Prerequisite: Bio 121 or equivalent and Bio 326 or Bio 327 or Bio 345

Biology 317 Anatomy & Physiology II for Bio Majors (4 credits) Sweet

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| 001 Lecture | MW | 12:45-2:05 | 001 LSC |
| 002 Lab | F | 12:45-3:45 | 308 LSC |
| 003 Lab | F | 9:30-12:30 | 308 LSC |

Course Description: This Anatomy & Physiology II course is a 300-level course for Biology & Biochemistry majors. It is a 4-credit course, of which 3 credits can be applied to the Biology major, unlike BIO 217. This class will have the same lecture room and time (Monday & Wednesdays 12:45-2:05 p.m.) as BIO 217. Students in the BIO 317 class will have weekly quizzes and midterm and final exams, as will those in BIO 217. However, the students registered for BIO 317 will have a joint laboratory and recitation section on Fridays from 9:30 am to 12:30 pm or 12:45 to 3:45 pm. These sections will not be the same as those laboratory and recitation sections in BIO 217. They will include a cat dissection, histology and other activities appropriate for a 300-level course. Understanding of laboratory material will be evaluated with 2-3 laboratory practicals.

Textbooks: Seeley's Anatomy & Physiology, VanPutte, Regan & Russo, 9th Ed. A Guide to Anatomy & Physiology Lab, Rust, and Mammalian Anatomy: The Cat, Fishbeck

Prerequisites: Bio 121-123 or equivalent

Examinations: Midterm & Final, plus weekly quizzes & 3 lab practical exams.

Class size: 48

Frequency of Offering: Spring semesters

Biology 326 Genetics (3 credits) Staff

TTh 11:00-12:20 HBC Gifford Aud

Course Description: Principles of inheritance, structure and synthesis of nucleic acids and proteins, microbial genetics, recombinant DNA technology and introduction to genomics.

Textbook: TBA

Prerequisites: Bio 121; Che 106

Class size: 350

Frequency of Offering: Each Spring semester

Biology 355 General Physiology (3 credits) Tupper
 TTh 8:00-9:20 105 LSC

Course Description: A lecture course on the physiology of mammals including circulation, kidney function, nervous system, sensory systems, muscle, cardiac function and digestion.

Textbook: Human Physiology, Vander, Sherman & Luciano, 13th edition, 2013

Prerequisites: Bio 121; Che 106, 116

Class Size: 100

Biology 360 Biology Laboratory Assistant (1 credit) Wiles
 TBA TBA TBA

Course Description: Students who have completed an upper-division 3-credit hour lab may receive one credit hour for assisting in the teaching of laboratories. This opportunity is especially appropriate for students considering teaching careers. May be repeated once for credit.

Textbook: None

Prerequisites: Permission of instructor in advance.

Examinations: None

Grade: A-F based upon participation & performance semester

Frequency of Offering: Each

Bio 396/Rel 359/Phi 396 Stem Cells & Society (3 credits) Russell, Paakkunainen
 Lecture section 001 MW 9:30-10:25 114 HL
 Recitation sections 002 F 9:30-10:25 114 HL
 003 F 10:35-11:30 114 HL

Course Description: The course meetings will include a combination of group and individual work, discussions, and lectures. The topic, the ethical, legal, religious and social complexities surrounding the research and use of stem cell technologies, is critical to our society and to many fields, including healthcare, developmental biology, and bioengineering. The course is team-taught by instructors with expertise in the basic sciences and regenerative medicine, in the relevant ethical, legal, philosophical, and religious issues, and in the role of the news media in framing and forming public perceptions. Students will gain requisite knowledge of the scientific and social topics, but will also acquire skills for identifying and addressing complex social, ethical and legal issues raised by stem cell use and development. Enrollment is capped at 30 students with permission to enroll managed to ensure a diverse representation of disciplines.

Biology 400/600-001 Seminar in Neurotoxicology (3 credits) J. Hewett
 TTh 10:35-11:45 214 LSC

Course Description: This course will explore the effects of poisons on nervous system function through the primary literature in the field. Discussions, seminars, and writing assignments will address function of the nervous system at the molecular, cellular, and systems levels.

Prerequisite: BIO 327

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| <u>Biology 400/600-003</u> | Comparing Sperm & Pollen Evolution | (3 credits) | Pitnick |
| TBA | TBA | TBA | |

Course Description: In this seminar style course, we will discuss how natural and sexual selection has shaped diversity in plant and animal germ cells. The goals are to resolve parallels and distinctions in broad patterns of pollen and sperm evolution, including their size, number, structural complexity and rate of diversification. Participants will independently investigate topics in the literature, choose literature for class discussion, give presentations, lead discussions and write about specific topics related to sperm and pollen form, function and evolution.

Prerequisite: BIO 345

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| <u>Biology 400/600-004</u> | Species Interactions & Biodiversity | (3 credits) | Althoff |
| MW | 3:45-5:05 | 126 LSC | |

Course Description: The way that species interact with one another is a key component for understanding the maintenance and creation of biodiversity. In this course, students will read the primary literature and discuss the conceptual and empirical basis for antagonistic and mutualistic interactions such as predatory-prey interactions, competition, parasitism, and mutualism. A broad range of taxonomic groups will be studied as well. The seminar style course will include lectures, discussions, and student presentations.

Prerequisite: Bio 345

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| <u>Biology 400/600-007</u> | Sexual Selection & Mating Strategies | (3 credits) | Friedman |
| TTh | 2:00-3:20 | 126 LSC | |

Course Description: Sexual selection theory addresses the evolution of traits that confer a reproductive advantage through enhanced competitiveness for or attractiveness to members of the opposite sex. In this seminar format course, students will give presentations, lead discussions and write about classic and contemporary literature in order to discern important conceptual aspects of sexual selection and their respective roles in evolutionary diversification and speciation in plants and animals.

Prerequisite: BIO 345

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| <u>Biology 400/600-009</u> | Ecosystem Ecology | (3 credits) | Frank |
| WF | 2:15-3:35 | 300 LSC | |

Course Description: Detailed examination of factors controlling the flow of energy and nutrients through terrestrial and aquatic ecosystems. Student-led discussions of published papers and written assignments.

Prerequisite: BIO 345

Biology 400-10/600-013 Brain & Behavioral Plasticity (3 credits) Gold

TTh 2:00-3:20 105 LSC

Course Description: Behavioral adaptations based on individual experiences give animals the ability to use their pasts to solve new problems, an ability that can be obviously important to an animal's survival. This course will examine behavioral plasticity and the brain mechanisms responsible for the changes in behavior. Interestingly, there appears to be considerable conservation across much of the animal kingdom of basic biological mechanisms that mediate behavioral and brain plasticity. The class will include information that crosses several levels of analysis, from the organism, to brain systems, to neurons, to synapses, to biochemical mechanisms. The class will also consider information about memory dysfunctions as seen in aging, dementia, and retardation in humans and in laboratory model animals such as rats and mice. The format will be lecture/discussion sessions with evaluations of student performance based on participation, writing assignments, and exams.

There are no specific prerequisites for this course. However, prior completion of at least one of the following classes listed is expected: Bio 327 Cell Biology, Bio 326 Genetics, Bio 211 Intro to Neuroscience, Psy 223 Biopsychology, Bio 355 General Physiology.

Biology 400-14/600-014 Seminar in Disturbance Ecology (3 credits) Staff

TTh 11:00-12:20 126 LSC

Course Description: Natural disturbances, such as fire, flooding, and hurricanes, and anthropogenic disturbances, such as land-use change, clear cutting, and dam creation, influence every ecosystem on Earth. Moreover, natural disturbance regimes can also be altered by humans resulting in the mitigation of some disturbance regimes and the increase of others. In this course, we will explore the influence of both natural and anthropogenic disturbance on ecosystem function and resilience and species adaptation. The purpose of this course is to provide an introduction to disturbance ecology through readings from the primary literature and class discussion. Thus, students will develop skills in how to comprehend scientific articles and through the semester will develop skills in critically examining the data that is presented.

Prerequisite: Bio 345

Biology 407/607 Advanced Neuroscience (3 credits) S. Hewett/SUNY Faculty

TTh 9:30-10:50 214 LSC

Course Description: An advanced introduction to neuroscience taught at the upper undergraduate or beginning graduate student level. The course spans the anatomy, physiology and chemistry of the nervous system, from the molecular to the cellular and systems level. Topics include: neurons and electrochemical and biophysical properties of neurons, neurochemistry, sensory and motor systems, neural plasticity and development. It is a required course for students enrolled in the Neuroscience ILM. It is strongly recommended that the student have completed either BIO 211 (Introduction to Neuroscience) or Psy 223 (Biopsychology) prior to enrolling in the course.

Textbook: Neuroscience, Purves, Augustine, Fitzpatrick, Hall. LaMantia, White, 5th edition.

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| <u>Biology 409</u> | General Microbiology | (4 credits) | Staff |
| 001 | Lecture: MWF | 11:40-12:35 | 1-019 CST |
| 002 | Lab: MW | 12:45-2:05 | 208 LSC |
| 003 | Lab: MW | 2:15-3:35 | 208 LSC |
| 004 | Lab: MW | 12:45-2:05 | 306 LSC |

Course Description: Biology 409 is a lecture and laboratory course which introduces students to the biology of microorganisms. Major emphasis is on bacteriology, with some lectures devoted to viruses, protozoa, algae and fungi. Topics include structure of bacteria, energetics, bacterial genetics, ecology of bacteria and host-parasite relationships. Pathogenic microorganisms, public health, and immunology are reviewed in General Microbiology, but this course is not oriented toward medical microbiology.

The laboratory emphasizes the basic skills necessary to isolate, cultivate and identify microorganisms.

Textbooks: TBA Frequency of Offering: Each Spring semester
Prerequisites: Core courses; plus Organic Chemistry (concurrently); Juniors & Seniors only.
Exams: Three lecture exams plus lab practical. Term paper required. Class size: 30

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| <u>Biology 419</u> | Jr/Sr Thesis Seminar | (1 credit) | Segraves |
| T | 5:00-6:00 pm | 106 LSC | |

Course Description: A discussion-student presentation format course designed to introduce highly qualified students to biological research. Students present progress reports on their thesis research. The course is designed to open communication among people with interests in biological research.

Textbook: None
Prerequisites: Acceptance into a thesis program in Biology (Honors or Distinction).
Level of Presentation: Junior-Senior: must be taken all four semesters
Class size: Varies Frequency of Offering: Every semester

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| <u>Biology 421</u> | Capstone Seminar in Biotechnology | (3 credits) | Coleman |
| TTh | 9:30-10:50 | 243 LSC | |

Course Description: This is a seminar course for upper-level students, particularly (but not limited to) those completing a major in Biotechnology. Students will evaluate scientific papers, current news stories, and biotechnology related issues. This evaluation will occur through reading, oral presentations, written assignments, and class discussion.

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| <u>Biology 422</u> | Bioinformatics for Life Scientists | (3 credits) | Welch |
| Lecture | M 12:45-1:50 | 156 LSC | |
| Lab | W 5:15-9:15 | 105 LSC | |

Course Description: Bioinformatics and how to apply it to biological research. As a lab course emphasis will be on the hands-on use of bioinformatics tools to solve relevant biological problems.

Prerequisite: BIO 326.

Biology 428 Capstone Seminar in Environmental Sciences (3 credits) Ritchie

T 11:00-1:30 435 LSC

Course Description: This is a seminar course for upper-level students, particularly those following the Environmental Science Curriculum (but not limited to) within a Biology or Earth Sciences major. Students will work together to critically evaluate, and propose solutions to, current environmental problems using a combination of reading, class discussion, written analyses and oral presentations. The predominant focus will be conducting independent research projects regarding important environmental problems.

Biology 460 Research in Biology (1-4 credits) Faculty

Course Description: Bio 460 is intended for Biology Majors who wish to participate in either an experimental laboratory or field research project. Bio 460 replaces the use of independent study or experience credit courses for research purposes. Student research projects will incorporate use of the scientific method, experimentation, data analysis, data presentation and interpretation, and the responsibilities of scientific integrity.

To enroll in Bio 460, the student must seek a sponsor who is willing to direct an appropriate project. Typically, the sponsor will assign the student to some aspect of an existing, larger research project. In consultation with the sponsor, the student will submit a petition with the Department Undergraduate Secretary which states the nature of the project, the expectations regarding time commitment (3 hrs. per week per credit hr.), and the means of evaluation. The student will then be given a waiver to permit enrollment.

The grading procedure for Bio 460 will generally be based on 1) the faculty member's evaluation of overall student performance, and 2) examination of required laboratory records or notebooks. Evaluation may also include 3) a report written by the student which documents the experience and results in a scientific format. Students can enroll in Bio 460 more than once, but the total credit hours applied to the Biology Major requirements cannot exceed 4 hours.

Biology 464/664 Applied Biotechnology (4 credits) S. Raina

001 Lec MWF 11:40-12:35 126 LSC
002 Lab T 12:30-3:45 206 LSC

Course Description: Biotechnology II is the second course of a two-course Biotechnology series. The first course, Biotechnology I, will be offered in the fall. These courses complement each other, but one is not required for the other.

These courses will introduce students to the molecular and genetic principles and processes involved in biotechnology. Lectures will include topics such as the genetic modification of microbial, plant, & animal cells, forensic biotechnology, and important medical, industrial, agricultural and environmental applications of biotechnology. Labs will cover many of the methods routinely used in biotechnology labs.

This course will address questions such as: What is biotechnology, how is it done, and how is it being used today? How can biotechnology impact lives of humans and other animals, plants, and the environment? What are the issues that biotechnology raises about the role of science and technology in society and ethical issues related to Biotechnology?

Prerequisites: BIO 326 & 327

Class size: 24

*This course will fulfill additional laboratory experience & the communication skills requirement

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| <u>Biology 465/665</u> | | Molecular Biology Lab | | (3 credits) |
| 001 Lecture | M & | 12:45-1:40 | 011 LSC | Raina, S |
| Lab | W | 12:45-4:45 | 206 LSC | |
| 002 Lecture | T & | 12:30-1:25 | 214 LSC | Raina, R |
| Lab | Th | 12:30-4:30 | 206 LSC | |

Course Description: Laboratory will teach basic experimental techniques including DNA isolation, restriction endonuclease cleavage of DNA, gene cloning, tissue culture techniques, construction of transgenic plants, gene expression analysis, and other techniques central to Molecular Biology. This course meets the communications skills requirement.

Prerequisites: BIO 326 & 327

Class size: 24

Frequency of Offering: Each semester

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| <u>BCM 476</u> | | General Biochemistry II | (3 credits) | Chan/Faculty |
| | MWF | 9:30-10:25 | 105 LSC | |

Course Description: Biochemistry II is a continuation of Biochemistry I covering: Mechanisms, integration and regulation of intermediary, autotrophic, nitrogen, and energy metabolism. Structure, function and metabolism of carbohydrates, lipids and proteins. The nature and function of subcellular organelles.

Text: Stryer: Biochemistry, 6th ed. (2006). Additional materials relating to specific topics will be provided in class.

Prerequisites: **Bio 575** (or equivalent) and one year of organic chemistry.

Exams: Four per semester. No comprehensive final; no make-ups given.

Class size: 45

Frequency of Offering: each Spring semester

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| <u>Biology 490</u> | | Independent Study (1-6 credits) | Faculty |
| | Proposal & permission of instructor required. | | |

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| <u>Biology 495</u> | | Distinction Thesis in Biology | (1-3 credits) Segraves |
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Course Description: This course is for students preparing a thesis in partial fulfillment of the requirements for the Distinction in Biology Program. It normally will be taken by Distinction students in the semester prior to graduation.

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| <u>Biology 499</u> | | Biology Thesis | (1-3 credits) Faculty |
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Writing of a thesis by senior Biology majors.

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| <u>Biology 501</u> | Biology of Cancer | (3 credits) | Fondy |
| | TTh | 9:30-10:50 | 105 LSC |

Course Description: Clinical features: Extent, effects, epidemiology, pathology, definitions, classifications, and model systems. Basic biology of cancer cells: Growth, biochemical characteristics, progression, invasion, metastasis. Causation: Viral oncogenesis, oncogenes, suppressor genes, apoptosis. Management: Host response, immunology, and immunotherapy. **Acquisition and use of the Turning Point XR transmitter (Not the RF "clicker" or the XR device) required.**

Textbook: The Biology of Cancer, Robert A. Weinberg, 2nd edition, 2014. Garland Science. Required.

Prerequisites: Either Bio 326 or Bio 327, plus Che 275; or equiv. **Class size:** 108

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| <u>Biology 503</u> | Developmental Biology | (3 credits) | Maine/Hall |
| | TTh | 11:00-12:20 | 011 LSC |

Course Description: We will examine the mechanisms that control animal development at the cellular and molecular levels. Topics to be covered include: patterns of early embryonic cleavage and morphogenesis, mechanisms of cellular differentiation, mechanisms of morphogenesis, pattern formation, and the genetic control of development. The course will emphasize the wide variety of experimental approaches used to study different aspects of development. Please note that this is **not** a descriptive embryology course. Rather, the goal is to provide students with an understanding of developmental mechanisms.

Classes will involve lectures, small group discussions, and general discussions. Readings will be from the textbook and the primary literature.

Textbook: S. Gilbert, Developmental Biology, 9th edition.

Prerequisites: Bio 326 & 327

Class size: 50

Frequency of Offering: Every year

GRADUATE COURSES

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| <u>Biology 600/400-001</u> | Seminar in Neurotoxicology | (0-3 credits) | J. Hewett |
| TTh | 10:35-11:45 | 214 LSC | |

Course Description: This course will explore the effects of poisons on nervous system function through the primary literature in the field. Discussions, seminars, and writing assignments will address function of the nervous system at the molecular, cellular, and systems levels.

Prerequisite: BIO 327

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| <u>Biology 600-002</u> | Open Problems in Soft Interfaces | (3 credits) | Bowick/Mather |
| MW | 5:15-6:35 | 414 Bowne | |

Course Description: A seminar on the critical analysis of the current literature on interfaces, whereby we will define the frontiers of interface research by identifying unsolved problems. Small interdisciplinary groups will scour online databases for “hot” articles or research groups associated with a particular research topic (e.g., biomaterial interfaces relevant to a particular disease or injury; fundamental interface problems in soft matter physics; techniques for patterning surfaces; mechanisms for bacterial biofilm control; novel mechanisms for drug delivery) ultimately selecting a single paper to be pitched to the entire class for in-depth consideration by all. Following this selection, several students will lead the discussion of the article. The class will critically analyze the paper and end with updating a developing list of unsolved problems. This course goes beyond traditional seminar or paper classes by developing appreciation for the process of defining a research project in the context of friendly, interdisciplinary debate that fosters improved scientific communication. Near the end of the course teams will be asked to prepare a concrete research proposal to be refereed by the class. The diverse composition of the teams will challenge the students to find ways of taking advantage of their different expertise and will provide a taste of team grant-writing. Offered every year in the Spring semester.

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| <u>Biology 600/400-003</u> | Comparing Sperm & Pollen Evolution | (0 - 3 credits) | Pitnick |
| TBA | TBA | TBA | |

Course Description: In this seminar style course, we will discuss how natural and sexual selection has shaped diversity in plant and animal germ cells. The goals are to resolve parallels and distinctions in broad patterns of pollen and sperm evolution, including their size, number, structural complexity and rate of diversification. Participants will independently investigate topics in the literature, choose literature for class discussion, give presentations, lead discussions and write about specific topics related to sperm and pollen form, function and evolution.

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| <u>Biology 600/400-004</u> | Species Interactions & Biodiversity | (0-3 credits) | Althoff |
| MW | 3:45-5:05 | 126 LSC | |

Course Description: The way that species interact with one another is a key component for understanding the maintenance and creation of biodiversity. In this course, students will read the primary literature and discuss the conceptual and empirical basis for antagonistic and mutualistic interactions such as predatory-prey interactions, competition, parasitism, and mutualism. A broad range of taxonomic groups will be studied as well. The seminar style course will include lectures, discussions, and student presentations.

Biology 600/400-007 Sexual Selection & Mating Strategies (0-3 credits) Friedman

TTh 2:00-3:20 126 LSC

Course Description: Sexual selection theory addresses the evolution of traits that confer a reproductive advantage through enhanced competitiveness for or attractiveness to members of the opposite sex. In this seminar format course, students will give presentations, lead discussions and write about classic and contemporary literature in order to discern important conceptual aspects of sexual selection and their respective roles in evolutionary diversification and speciation in plants and animals.

Biology 600/400-009 Ecosystem Ecology (0-3 credits) Frank

WF 2:15-3:35 300 LSC

Course Description: Detailed examination of factors controlling the flow of energy and nutrients through terrestrial and aquatic ecosystems. Student-led discussions of published papers and written assignments.

Biology 600-13/400-010 Brain & Behavioral Plasticity (3 credits) Gold

TTh 2:00-3:20 105 LSC

Course Description: Behavioral adaptations based on individual experiences give animals the ability to use their pasts to solve new problems, an ability that can be obviously important to an animal's survival. This course will examine behavioral plasticity and the brain mechanisms responsible for the changes in behavior. Interestingly, there appears to be considerable conservation across much of the animal kingdom of basic biological mechanisms that mediate behavioral and brain plasticity. The class will include information that crosses several levels of analysis, from the organism, to brain systems, to neurons, to synapses, to biochemical mechanisms. The class will also consider information about memory dysfunctions as seen in aging, dementia, and retardation in humans and in laboratory model animals such as rats and mice. The format will be lecture/discussion sessions with evaluations of student performance based on participation, writing assignments, and exams.

There are no specific prerequisites for this course. However, prior completion of at least one of the following classes listed is expected: Bio 327 Cell Biology, Bio 326 Genetics, Bio 211 Intro to Neuroscience, Psy 223 Biopsychology, Bio 355 General Physiology.

Biology 600-14/400-014 Seminar in Disturbance Ecology (0-3 credits) Staff

TTh 11:00-12:20 126 LSC

Course Description: Natural disturbances, such as fire, flooding, and hurricanes, and anthropogenic disturbances, such as land-use change, clear cutting, and dam creation, influence every ecosystem on Earth. Moreover, natural disturbance regimes can also be altered by humans resulting in the mitigation of some disturbance regimes and the increase of others. In this course, we will explore the influence of both natural and anthropogenic disturbance on ecosystem function and resilience and species adaptation. The purpose of this course is to provide an introduction to disturbance ecology through readings from the primary literature and class discussion. Thus, students will develop skills in how to comprehend scientific articles and through the semester will develop skills in critically examining the data that is presented.

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| <u>Biology 607/407</u> | Advanced Neuroscience | S. Hewett/J. Hewett/SUNY Faculty |
| TTh | 9:30-10:50 | 214 LSC |

Course Description: An advanced introduction to neuroscience taught at the upper undergraduate or beginning graduate student level. The course spans the anatomy, physiology and chemistry of the nervous system, from the molecular, to the cellular and systems level. Topics include: neurons and electrochemical and biophysical properties of neurons, neurochemistry, sensory and motor systems, neural plasticity and development.

Textbook: Neuroscience, Purves, Augustine, Fitzpatrick, Hall. LaMantia, White, 5th edition.

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| <u>Biology 664/464</u> | Applied Biotechnology | (4 credits) | S. Raina |
| 001 Lec | MWF 11:40-12:35 | 126 LSC | |
| 002 Lab | T 12:30-3:45 | 206 LSC | |

Course Description: Biotechnology II is the second course of a two-course Biotechnology series. The first course, Biotechnology I, will be offered in the fall. These courses complement each other, but one is not required for the other.

These courses will introduce students to the molecular and genetic principles and processes involved in biotechnology. Lectures will include topics such as the genetic modification of microbial, plant, & animal cells, forensic biotechnology, and important medical, industrial, agricultural and environmental applications of biotechnology. Labs will cover many of the methods routinely used in biotechnology labs.

This course will address questions such as: What is biotechnology, how is it done, and how is it being used today? How can biotechnology impact lives of humans and other animals, plants, and the environment? What are the issues that biotechnology raises about the role of science and technology in society and ethical issues related to Biotechnology?

Prerequisites: BIO 326 & 327

Class size: 24

*This course will fulfill additional laboratory experience & the communication skills requirement

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| <u>Biology 665/465</u> | Molecular Biology Lab | (3 credits) |
| 001 Lecture | M & 12:45-1:40 | 011 LSC |
| Lab | W 12:45-4:45 | 206 LSC |
| 002 Lecture | T & 12:30-1:25 | 214 LSC |
| Lab | Th 12:30-4:30 | 206 LSC |

Course Description: Laboratory will teach basic experimental techniques including DNA isolation, restriction endonuclease cleavage of DNA, gene cloning, tissue culture techniques, construction of transgenic plants, gene expression analysis, and other techniques central to Molecular Biology. This course meets the communications skills requirement.

Prerequisites: BIO 326, 327 & 575, or permission of instructor

Frequency of Offering: Spring semesters

Biology 688 Biological Literature (1-3 credits) Faculty

Course Description: This number is used for courses that are essentially tutorials in which a student reviews a specific area in conjunction with a faculty member.

Prerequisites: The content and procedures for evaluation are outlined in a petition to be filed with the department (122 Lyman Hall) to obtain a waiver prior to registration.

Frequency of Offering: every Semester

Biology 690 Independent Study (1-6 credits) Faculty

Course Description: This number is used for special projects during which graduate students conduct laboratory or field research that is not related to their thesis or dissertation research. In general, a student should not register for Bio 690 supervised by his or her advisor.

Prerequisites: A proposal for Independent Study must be completed (in which the project and procedures for evaluation are described), signed by the supervising professor and taken to 110 LSC to obtain a waiver prior to registration.

Frequency of Offering: every Semester

Biology 705 Graduate Research Seminars (0-1 credit) Hall

T 3:30-4:25 106 LSC

Course Description: Students present their thesis or dissertation research and critically evaluate the research presentations of other students. Offered every semester.

Frequency of Offering: every Semester

Biology 997 Masters Thesis (0-6 credits)

Biology 999 Dissertation (0-15 credits)

GRD 998 Degree in Progress (0 credits)

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