BY 501. Advanced Genetics for Teachers I. 3 Hours.
Basic genetic principles; recent research developments. Prerequisite: Permission of instructor.

BY 502. Botany for Teachers. 3 Hours.

BY 503. Advanced Biology for Teachers III. 1 Hour.
Laboratory supplementing lecture (BY 502) through use of human specimens, models, and demonstrations.

BY 504. Life Science for Middle School Teachers. 3 Hours.
Life Science for Middle School Teachers.

BY 505. Microbial Ecology. 3 Hours.
Microorganisms in nature; interactions with each other and with environment. Independent project required. Prerequisite: BY 271.

BY 506. Galapagos Ecology. 3 Hours.
The ecology of the Galapagos Islands, with an emphasis on terrestrial & marine organisms. Major portion conducted on the Galapagos Islands. Lecture & field trips. Library research paper required. Prerequisites: Graduate Standing and Permission of Instructor.

BY 507. Ecology. 3 Hours.
The study of interactions between organisms and their environment. An introduction to ecological processes at individual, population, community, and ecosystem levels and their relevance to current environmental problems Lectures. Independent project required. Prerequisite: Graduate Standing.

BY 508. Advanced Invertebrate Zoology. 3 Hours.
An overview of the major tropical ecotypes with emphasis on ecology of terrestrial, aquatic, and marine tropical organisms. Major portion of course taught at a tropical field station in the Caribbean. Lectures, laboratory, and field trips. Library research paper required. Prerequisites: BY 505 [Min Grade: D] or BY 256 [Min Grade: D] or BY 470 [Min Grade: D]

BY 509. Microbial Physiology. 3 Hours.
Microbial structure and function, growth, metabolism, and regulation of cellular activity. Independent project required. Prerequisites: Permission of instructor. 3 credit hours.

BY 510. Advanced Invertebrate Zoology. 3 Hours.
This course will introduce students to key concepts of cell biology with a focus on cellular components, cell metabolism, cell organization, molecular dogma, cellular trafficking, cell cycle, cell signaling, cancer and stem cells. Classical cell biology will be discussed in historical perspectives. Current techniques used in the study of cell biology will be discussed in the appropriate sections. The course is divided into three modules: weeks 1-6, weeks 7-11, and weeks 12-15. 3 Credit Hours. Graduate Project required.

BY 511. Molecular Genetics. 3 Hours.
Prokaryotic and eukaryotic gene structure and function. Independent project required. Prerequisites: BY 210 [Min Grade: D] and BY 330 [Min Grade: D] and CH 234 [Min Grade: D]

BY 512. Advanced Genetics for Teachers II. 3 Hours.
Methods of scientific process, experimental design, data interpretation and presentation, and scientific writing. Prerequisite: BY 255.

BY 515. Human Anatomy for Educators. 4 Hours.
Principles of vertebrate structure with emphasis on gross and microscopic human anatomy. Survey of human embryology and evolution. Lecture and laboratory. Graduate project/presentation required.

BY 527. Histology. 4 Hours.
Microscopic anatomy of cells, tissues, and organs of animals; correlation of structure and function. Techniques and methodology. Lecture and laboratory. Completion of additional independent project required for graduate credit.

BY 527L. Histology Laboratory. 0 Hours.
Histology Lab required with BY 527 lecture.

BY 530. Graduate Cell Biology. 3 Hours.
This course will introduce students to key concepts of cell biology with a focus on cellular components, cell metabolism, cell organization, molecular dogma, cellular trafficking, cell cycle, cell signaling, cancer and stem cells. Classical cell biology will be discussed in historical perspectives. Current techniques used in the study of cell biology will be discussed in the appropriate sections. The course is divided into three modules: weeks 1-6, weeks 7-11, and weeks 12-15. 3 Credit Hours. Graduate Project required.

BY 531. Advanced Recombinant DNA Technology. 3 Hours.
Manipulation of genes and their regulations, and techniques used in recombinant DNA technology. Independent project required. Prerequisites: BY 311, BY 330, CH 233 and CH 460 or 461.

BY 535. Natural History of Vertebrates. 4 Hours.
Adaptations of vertebrates for survival in particular environments. Survey and classification of local vertebrates. Two lectures, one laboratory or field trip per week. Independent project required.

BY 535L. Natural History of the Vertebrates Lab. 0 Hours.
Lab must be taken with BY 535 lecture.

BY 540. Biology of Aging. 3 Hours.
Current understanding of aging, measuring aging changes, theories of aging and aging changes in various human systems. Prerequisites: BY 123 [Min Grade: C]
BY 611. Advanced Human Anatomy. 4 Hours.
This course is a detailed, advanced examination of human anatomy and histology. In a laboratory setting, students will achieve course objectives from dissecting a human cadaver, and observing prosected cadavers and casted models.

BY 612. CIRTL-Biology. 1-4 Hour.
This discipline specific seminar course in CIRTL (The Center for the Integration of Research, Teaching and Learning) - Biology is specially designed to offer students a hands-on opportunity to do an in-depth analysis on various effective teaching techniques that can be utilized in a typical college classroom setting. In the light of this analysis, students are expected to deliver a presentation simulating a classroom lecture on any topic related to Biology or if they prefer, they can also give an oral presentation on any pedagogical topic.

BY 613. CIRTL Service-Learning Workshop. 1 Hour.
This workshop offered by the Department of Biology for CIRTL (The Center for the Integration of Research, Teaching and Learning) @UAB is specially designed to offer students a hands-on opportunity on designing a service-learning course in the realm of their study with an added emphasis on the importance of service-learning in today’s classroom.

BY 614. Advanced Cell Biology. 3 Hours.
This course will focus on understanding cell signaling, function, and dynamics, which is the core of modern cell biology topics. This course is targeted to students who are interested in the advanced level current topics of Cell Biology. Topics include the cellular organization and function, cell cycle, autophagy, apoptosis, stem cell and cellular signaling pathways. This course also includes reading of primary literature, and writing and presenting a research proposal. Graduate project required.

BY 616. Cellular Physiology. 3 Hours.
Structure and function of cells and their components at the molecular level. Laboratory experience using modern equipment and biochemical methods. Independent project required.

BY 618. Colloquium in Biology of Aging. 1 Hour.
The course will focus on readings and interpretation of scientific papers, data, and experimental results relevant to endocrinology and aging. In addition to readings, oral presentations, discussions, and a research proposal are the major components of the course.

BY 619. Reproductive Physiology. 3 Hours.
Comparative reproductive physiology in animals with emphasis on mammals. Independent project required.

BY 620. General Endocrinology. 3 Hours.
The central theme of this course is the role of hormone chemical messengers in the regulation of physiological processes. Topics include structure of endocrine cells and glands, hormone synthesis and chemistry, physiological effects of hormones, and mechanisms of hormone action. Emphasis is placed on vertebrate systems, but instructive invertebrate systems are also considered. Term paper required.

BY 621. Advanced Molecular Genetics. 3 Hours.
This discipline specific seminar course in CIRTL (The Center for the Integration of Research, Teaching and Learning) @UAB is specially designed to offer students a hands-on opportunity to do an in-depth analysis on various effective teaching techniques that can be utilized in a typical college classroom setting. In the light of this analysis, students are expected to deliver a presentation simulating a classroom lecture on any topic related to Biology or if they prefer, they can also give an oral presentation on any pedagogical topic.

BY 622. Evolutionary Biology. 3 Hours.
This course introduces the history of evolutionary thought and modern evolutionary theory. Discussions cover (but are not limited to) the history of life, mechanisms of evolutionary change, sexual selection, adaptation, speciation, and molecular evolution. Students will also be introduced to historical and contemporary studies of evolution on a wide variety of topics and organisms. Regular meetings outside of lecture will involve discussions of classic and contemporary research papers in the field.

BY 623. Advanced Molecular Genetics. 3 Hours.
Examination of the molecular genetics of eukaryotic organisms, including genomes, nucleosomes, chromosomes, transcription, splicing, transposition and signal transduction. The role of molecular biology in immune diversity and cell growth will also be studied.

BY 624. Functional Genomics and Systems Biology. 3 Hours.
Systems biology is an inter-disciplinary study underlying complex biological processes as integrated systems of many interacting components. This course will give students a foundation in understanding complex biological interactions at the molecular, network and genomic level. This course will cover state-of-the-art high throughput established and novel approaches used in genome sequencing, transcriptomics, proteomics and metabolomics to obtain, integrate and analyze complex data. The students will also get familiar with knowledge on experimental perturbation of genomes, gene regulatory networks, comparative genomics and evolution, basic bioinformatics. This course will be a combination of text based lectures and discussions of the current literature relevant to Functional Genomics and Systems Biology. Prerequisite: BY210 minimum grade of C.

BY 625. Biological Processes in Aging. 3 Hours.
This discipline specific seminar course in CIRTL (The Center for the Integration of Research, Teaching and Learning) @UAB is specially designed to offer students a hands-on opportunity to do an in-depth analysis on various effective teaching techniques that can be utilized in a typical college classroom setting. In the light of this analysis, students are expected to deliver a presentation simulating a classroom lecture on any topic related to Biology or if they prefer, they can also give an oral presentation on any pedagogical topic.

BY 626. Evolutionary Medicine. 3 Hours.
An evolutionary approach to issues relating to human health and disease.

BY 627. Instruct Bio Labs: Teaching Techniques. 3 Hours.
Student will assist in instruction of an introductory biology laboratory. Responsibilities will also include preparation of quizzes and practicals and designing and conducting an instructional laboratory exercise.

Prerequisites: BY 123 [Min Grade: C] and BY 210 [Min Grade: C]

BY 628. Biological Information Resources. 3 Hours.
The National Center for Biological Information (NCBI) website is a treasure house of information and tools for researchers in all areas of modern Biology. The goal of this course is to provide guidance for students who wish to become familiar with the NCBI website through an online learning experience. They will learn many of the features available at this site and will gain experience using some of the tools. The course will be taught completely online and will consist of 1) Guidelines for navigating through NCBI, 2) Study guide questions for students to answer online, 3) NCBI tutorials with questions to be answered online, 4) Assignments with questions to be answered online, 5) Online exams. Graduate levels require a graduate project.

Prerequisites: BY 123 [Min Grade: C] or BY 124 [Min Grade: C]

BY 629. Evolutionary Biology. 3 Hours.
This course introduces the history of evolutionary thought and modern evolutionary theory. Discussions cover (but are not limited to) the history of life, mechanisms of evolutionary change, sexual selection, adaptation, speciation, and molecular evolution. Students will also be introduced to historical and contemporary studies of evolution on a wide variety of topics and organisms. Regular meetings outside of lecture will involve discussions of classic and contemporary research papers in the field.

BY 630. Biological Processes in Aging. 3 Hours.
The #1 threat to human health – far greater than cancer, heart disease, and Alzheimer’s disease combined – is aging. Aging is also a fascinating biological puzzle. Why do we, and virtually every other species, age in the first place? Why can’t nature simply maintain the body it built? This course will introduce you to the fascinating process of biological aging, its impact on human and animal life, how it evolved, and the manner in which its biology is investigated, the cellular and molecular process that underlie aging, and how efforts to slow human aging are progressing. We will cover the history of exceptionally long human and animal lives and also delve into current and historical approaches to alter the rate of aging in humans with an emphasis on current promising research areas. In covering this material we will also encounter some of the many colorful scientists who have worked on the problem of aging as well as the past and current frauds and charlatans who are just trying to make a buck off of people’s fear of death and disability.

Prerequisites: BY 123 [Min Grade: C] and BY 210 [Min Grade: C]

BY 631. Advanced Cell Biology. 3 Hours.
This course will focus on understanding cell signaling, function, and dynamics, which is the core of modern cell biology topics. This course is targeted to students who are interested in the advanced level current topics of Cell Biology. Topics include the cellular organization and function, cell cycle, autophagy, apoptosis, stem cell and cellular signaling pathways. This course also includes reading of primary literature, and writing and presenting a research proposal. Graduate project required.

By 632. Biological Information Resources. 3 Hours.
The National Center for Biological Information (NCBI) website is a treasure house of information and tools for researchers in all areas of modern Biology. The goal of this course is to provide guidance for students who wish to become familiar with the NCBI website through an online learning experience. They will learn many of the features available at this site and will gain experience using some of the tools. The course will be taught completely online and will consist of 1) Guidelines for navigating through NCBI, 2) Study guide questions for students to answer online, 3) NCBI tutorials with questions to be answered online, 4) Assignments with questions to be answered online, 5) Online exams. Graduate levels require a graduate project.

Prerequisites: BY 123 [Min Grade: C] or BY 124 [Min Grade: C]

BY 633. Advanced Molecular Genetics. 3 Hours.
Examination of the molecular genetics of eukaryotic organisms, including genomes, nucleosomes, chromosomes, transcription, splicing, transposition and signal transduction. The role of molecular biology in immune diversity and cell growth will also be studied.

BY 634. Functional Genomics and Systems Biology. 3 Hours.
Systems biology is an inter-disciplinary study underlying complex biological processes as integrated systems of many interacting components. This course will give students a foundation in understanding complex biological interactions at the molecular, network and genomic level. This course will cover state-of-the-art high throughput established and novel approaches used in genome sequencing, transcriptomics, proteomics and metabolomics to obtain, integrate and analyze complex data. The students will also get familiar with knowledge on experimental perturbation of genomes, gene regulatory networks, comparative genomics and evolution, basic bioinformatics. This course will be a combination of text based lectures and discussions of the current literature relevant to Functional Genomics and Systems Biology. Prerequisite: BY210 minimum grade of C.

Prerequisites: BY 210 [Min Grade: C]

BY 635. Biological Processes in Aging. 3 Hours.
The #1 threat to human health – far greater than cancer, heart disease, and Alzheimer’s disease combined – is aging. Aging is also a fascinating biological puzzle. Why do we, and virtually every other species, age in the first place? Why can’t nature simply maintain the body it built? This course will introduce you to the fascinating process of biological aging, its impact on human and animal life, how it evolved, and the manner in which its biology is investigated, the cellular and molecular process that underlie aging, and how efforts to slow human aging are progressing. We will cover the history of exceptionally long human and animal lives and also delve into current and historical approaches to alter the rate of aging in humans with an emphasis on current promising research areas. In covering this material we will also encounter some of the many colorful scientists who have worked on the problem of aging as well as the past and current frauds and charlatans who are just trying to make a buck off of people’s fear of death and disability.

Prerequisites: BY 123 [Min Grade: C] and BY 210 [Min Grade: C]
BY 637. Epigenetics. 3 Hours.
This course provides a survey of the field of epigenetics, introducing the student to the diverse areas of epigenetic research in a variety of eukaryotic systems. The course combines lectures with discussion of primary literature and research talks from invited faculty speakers working in epigenetics. In addition to providing an overview of the field of epigenetics, this course emphasizes working with primary scientific literature and the development of critical reading skills. Additional assignments are required for graduate credit.

BY 640. Immunology. 3 Hours.
Immune system and functions of host humoral and cellular immune responses. Mechanisms of antigen and antibody reactions and basic immunological methods. Term paper required.

BY 642. Experimental Phycology. 4 Hours.
Introduction to algae. Experimental approaches to productivity. Algae as model systems. Independent project required. Concurrent enrollment in BY 642 lab required.

BY 642L. Experimental Phycology Lab. 0 Hours.
Lab must be taken concurrently with BY 642 lecture.

BY 645. Neuroanatomy. 4 Hours.
This course will provide detailed lecture and laboratory experiences that describe the anatomy of the human brain, spinal cord, and peripheral nervous system. Students will culture rat hippocampal neurons and map the cerebral and cerebellar cortex on preserved human brains. Deep brain structures will be identified and their functional significance explored. Cranial nerves and major peripheral nerves will be described and identified through cadaveric dissections. Normal pathways will be contrasted with examples of abnormalities along with the resulting functional impairments. Graduate credit will be earned through the completion of additional term papers and/or projects.

BY 646. Techniques in Biological Research. 3 Hours.
Concepts and practical application of techniques pertinent to biological research.

BY 648. Psychoneuroimmunology. 3 Hours.
Explores communication between neuroendocrine and immune systems.

BY 652. Field Botany for Teachers. 4 Hours.
Principles and techniques of plant identification and classification; consideration of phylogenetic systems. Lectures and field trips. Independent project required.

BY 652L. Field Botany Lab. 0 Hours.
Lab must be taken with BY 652 lecture.

BY 655. Biometry. 3 Hours.
Statistical techniques used to analyze and interpret data, with emphasis on biological applications. Lecture and computer-based laboratory. 3 semester hours. Graduate standing and permission of instructor.

BY 656. Comparative Vertebrate Anatomy. 4 Hours.
Study of the anatomical systems of vertebrates in an evolutionary and functional context. Covers form, function, development and phylogeny of vertebrates, with overviews of organ systems, and the major adaptive events of vertebrate evolution. Labs complement lectures with dissections of representative species, and surveys of specializations in other forms. Lecture and laboratory.

BY 656L. Comparative Vertebrate Anatomy Lab. 0 Hours.
Comparative Vertebrate Anatomy Lab required with BY 656 lecture.

BY 662. Introductory Neurobiology. 3 Hours.
Introduction to biological basis of nervous system function. Comparative approach applying molecular, cellular, and systems' concepts to nervous system function is used to examine electrical and chemical signaling, neural circuitry, and cellular basis of behavior and neural development. Independent project required.

BY 667. Population Ecology. 3 Hours.
This course covers the structure and dynamics of populations with an emphasis on understanding how reproduction, mortality, and dispersal interact to control fluctuations in population size and structure. Special emphasis will be placed on the use of models to address specific applications in conservation biology and natural resource management. Independent project/paper required. Preqs: BY 570 & graduate standing or permission of instructor.

BY 668. Conservation Genetics. 3 Hours.
This intensive course will introduce students to the genetic tools of modern population biology – which ones are available, practical, and useful for particular questions – and how these genetic analyses have been applied to a wide variety of ecological topics, including: dispersal, life histories, recruitment, habitat and mate choice, local selection, genetic differentiation, the conservation of biodiversity, and speciation. Importantly, this course is an opportunity to become proficient at applying molecular tools to bolster ecological studies. Time will be spent in lectures and learning practical coding and data analyses.

BY 670. Scientific Communication. 3 Hours.
Becoming a professional biologist is challenging and requires mastering a variety of skills. This course complements the biological knowledge graduate students gain from other courses and their thesis research by providing training, experience, and critical feedback in the following areas.

BY 671. Biochemical Adapt to the Environment. 3 Hours.
Examination of physiological and biochemical adaptations of organisms to physical environment.

BY 673. Biochemical Adaptation to the Environment. 3 Hours.
Study of chemical interactions between organisms or between organisms and their environment. Topics include chemical signaling between organisms, sensing of the chemical environment, and chemical defenses against predators, pathogens, biofoulers, or competitors. Students will be introduced to these topics in a wide variety of terrestrial and aquatic habitats, with a special emphasis on marine organisms. Independent project/paper required. Preq: Graduate standing.

BY 675. Comparative Developmental Biology. 3 Hours.
Mechanisms of development with emphasis on comparative biology. Graduate standing.

BY 679. Colloquium in Evidenced Based Teaching. 1 Hour.
This pedagogy based colloquium is designed to prepare the next generation of future STEM faculty members in evidence-based practices. The course will begin with an in-depth discussion related to the Vision and Change in Biology Undergraduate Education: A Call to Action. Specific chapters from this document will be assigned as “Reading Assignments” on a weekly basis. Furthermore, journal article discussions will be included to better understand innovative teaching strategies like active-learning, classroom-response system, inclusive learning environments and initiating team based learning activities.
BY 680. Epigenetics Discussion. 1 Hour.
This course provides the student with an exposure to a wide range of basic epigenetics research topics. It will promote scientific literacy, discussion skills, and critical thinking skills. In addition, students will gain experience developing lectures and providing constructive criticisms to their peers.

BY 681. Colloquium in Physiological Ecology. 1 Hour.
Current research.

BY 682. Colloquium in Immunology. 1 Hour.
Current research.

BY 683. Colloquium in Physiology. 1 Hour.
Current research.

BY 684. Colloquium in Microbial Ecology. 1 Hour.
Current research.

BY 685. Colloquium in Cell Biology. 1 Hour.
Current research.

BY 686. Colloquium in Mammalian Development. 1 Hour.
Current research.

BY 687. Colloquium in Endocrinology. 1 Hour.
Current research.

BY 688. Colloquium in Algal Ecophysiology. 1 Hour.
Current research in specific areas.

BY 689. Colloquium in Genetics. 1 Hour.
Current research.

BY 690. Colloquium in Cellular Physiology. 1 Hour.
Current research in specific areas.

BY 691. Colloquium in Botany. 1 Hour.
Current research developments.

BY 692. Colloquium in Ecology. 1 Hour.
Current research.

BY 693. Colloquium in Embryology. 1 Hour.
Current research.

BY 694. Colloquium in Microbiology. 1 Hour.
Current research in microbial ecology and microbial physiology.

BY 695. Special Topics in Biology I. 1-4 Hour.

BY 696. Special Topics in Biology II. 1-4 Hour.
bioinformatics, comparative genomics and evolution, basic bioinformatics. This course will be a combination of text based lectures and discussions of the current literature relevant to Functional Genomics and Systems Biology.

Prerequisites: BY210 minimum grade of C.

BY 697. Investigative Techniques. 1-2 Hour.
Application of modern experimental techniques in solving research problems.

BY 698. Nonthesis Research. 1-12 Hour.
Non-thesis research hours.

BY 699. Thesis Research. 1-10 Hour.
Prerequisite: Admission to candidacy.
Prerequisites: GAC M

BY 718. Colloquium in Biology of Aging. 1 Hour.
The course will focus on readings and interpretation of scientific papers, data, and experimental results relevant to endocrinology and aging. In addition to readings, oral presentations, discussions, and a research proposal are the major components of the course.

BY 732. Biological Information Resources. 3 Hours.
The National Center for Biological Information (NCBI) website is a treasure house of information and tools for researchers in all areas of modern Biology. The goal of this course is to provide guidance for students who wish to become familiar with the NCBI website through an online learning experience. They will learn many of the features available at this site and will gain experience using some of the tools. The course will be taught completely online and will consist of 1) Guidelines for navigating through NCBI, 2) Study guide questions for students to answer online, 3) NCBI tutorials with questions to be answered online, 4) Assignments with questions to be answered online, 5) Online exams. Graduate levels require a graduate project.
Prerequisites: BY 123 [Min Grade: C] or BY 124 [Min Grade: C]

BY 734. Functional Genomics and Systems Biology. 3 Hours.
Systems biology is an inter-disciplinary study underlying complex biological processes as integrated systems of many interacting components. This course will give students a foundation in understanding complex biological interactions at the molecular, network and genomic level. This course will cover state-of-the-art high throughput established and novel approaches used in genome sequencing, transcriptomics, proteomics and metabolomics to obtain, integrate and analyze complex data. The students will also get familiar with knowledge on experimental perturbation of genomes, gene regulatory networks, comparative genomics and evolution, basic bioinformatics. This course will be a combination of text based lectures and discussions of the current literature relevant to Functional Genomics and Systems Biology.

Prerequisite: BY210 minimum grade of C.

BY 736. Biological Processes in Aging. 3 Hours.
The #1 threat to human health – far greater than cancer, heart disease, and Alzheimer’s disease combined – is aging. Aging is also a fascinating biological puzzle. Why do we, and virtually every other species, age in the first place? Why can’t nature simply maintain the body it built? This course will introduce you to the fascinating process of biological aging, its impact on human and animal life, how it evolved, and the manner in which its biology is investigated, the cellular and molecular process that underlie aging, and how efforts to slow human aging are progressing. We will cover the history of exceptionally long human and animal lives and also delve into current and historical approaches to alter the rate of aging in humans with an emphasis on current promising research areas. In covering this material we will also encounter some of the many colorful scientists who have worked on the problem of aging as well as the past and current frauds and charlatans who are just trying to make a buck off of people’s fear of death and disability.

Prerequisites: BY 123 [Min Grade: C] and BY 210 [Min Grade: C]

BY 737. Epigenetics. 3 Hours.
This course provides a survey of the field of epigenetics, introducing the student to the diverse areas of epigenetic research in a variety of eukaryotic systems. The course combines lectures with discussion of primary literature and research talks from invited faculty speakers working in epigenetics. In addition to providing an overview of the field of epigenetics, this course emphasizes working with primary scientific literature and the development of critical reading skills. Additional assignments are required for graduate credit.

BY 746. Tech in Biological Research I. 3 Hours.
Concepts and practical application of techniques pertinent to biological research.
BY 755. Biometry. 3 Hours.
Statistical techniques used to analyze and interpret data, with emphasis on biological applications. Lecture and computer-based laboratory. 3 semester hours. Graduate standing and permission of instructor.

BY 767. Population Ecology. 3 Hours.
This course covers the structure and dynamics of populations with an emphasis on understanding how reproduction, mortality, and dispersal interact to control fluctuations in population size and structure. Special emphasis will be placed on the use of models to address specific applications in conservation biology and natural resource management. Independent project/paper required. Graduate standing or permission of instructor.

BY 768. Conservation Genetics. 3 Hours.
This intensive course will introduce students to the genetic tools of modern population biology – which ones are available, practical, and useful for particular questions – and how these genetic analyses have been applied to a wide variety of ecological topics, including: dispersal, life histories, recruitment, habitat and mate choice, local selection, genetic differentiation, the conservation of biodiversity, and speciation. Importantly, this course is an opportunity to become proficient at applying molecular tools to bolster ecological studies. Time will be spent in lectures and learning practical coding and data analyses.

BY 770. Scientific Communication. 3 Hours.
Becoming a professional biologist is challenging and requires mastering a variety of skills. This course complements the biological knowledge graduate students gain from other courses and their thesis research by providing training, experience, and critical feedback in the following areas.

BY 773. Biochemical Adaptation to the Environment. 3 Hours.

BY 780. Epigenetics Discussion. 1 Hour.
This course provides the student with an exposure to a wide range of basic epigenetics research topics. It will promote scientific literacy, discussion skills, and critical thinking skills. In addition, students will gain experience developing lectures and providing constructive criticisms to their peers.

BY 781. Colloquium in Physiological Ecology. 1 Hour.
Current research.

BY 782. Colloquium in Immunology. 1 Hour.
Current research.

BY 783. Colloquium in Physiology. 1 Hour.
Current research.

BY 784. Colloquium in Microbial Ecology. 1 Hour.
Current research.

BY 785. Colloquium in Cell Biology. 1 Hour.
Current research.

BY 786. Colloquium in Mammalian Development. 1 Hour.
Current research.

BY 787. Colloquium in Endocrinology. 1 Hour.
Current research.

BY 788. Colloquium in Algal Ecophysiology. 1 Hour.
Current research in specific areas.

BY 789. Colloquium in Genetics. 1 Hour.
Current research.

BY 790. Colloquium in Cellular Physiology. 1 Hour.
Current research in specific areas.