

Fall 2020 Course Descriptions as of 04/05/2020 08:11 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: http://rcs.registrar.arizona.edu/course_descriptions_key.

Genetics (GENE)

GENE 430: Conservation Genetics (3 units)

Description: Basic methods and theories of genetic/genomic analyses together with the application of these analyses to promote conservation, proper management, and long term survival of free-ranging species, including the exploration of current conservation genetic/genomic literature.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Lecture	Required
	Seminar	May Be Offered

Also offered as: ECOL 430, WFSC 430

Co-convened with: GENE 530

Course typically offered:

Main Campus: Fall

Recommendations and additional information: ECOL 320, PLS 312, basic genetics class, or consent of instructor.

Home department: School of Natural Resources and the Environment

GENE 430L: Conservation Genetics Lab (1 unit)

Description: This course is offered to meet the needs of students wanting to work in conservation genetics and to provide a genetic perspective to students working in other areas of conservation biology. The two primary goals of the class are to give students first-hand experience in a conservation genetics lab and to publish a research paper as a class. This is a laboratory based course with an emphasis on producing useful conservation related data and subsequently publishing our results. The class will be structured to mirror the steps involved in taking a research project from an idea all the way through to publication. Emphasis will be primarily on the lab work, data analyses, and writing and review process, though grant writing and sample collection will be introduced.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Laboratory	Required
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Also offered as: WFSC 430L

Co-convened with: GENE 530L

Course typically offered:

Main Campus: Fall

Home department: School of Natural Resources and the Environment

Enrollment requirement: Concurrent enrollment in WFSC/GENE/ECOL 430 required.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 449A: Plant Genetics and Genomics (3 units)

Description: A 3 unit lecture/discussion course that provides an advanced treatment of the current knowledge and experimental approaches used in genetic and genomic analysis, with emphasis on plants. Basic understanding of Mendelian genetics, gene and genome structure and function is required.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: ECOL 449A, GENE 449A, MCB 449A

Also offered as: ECOL 449A, MCB 449A, PLS 449A

Co-convened with: GENE 549A

Recommendations and additional information: PLS 312.

Home department: School of Plant Science

GENE 498: Senior Capstone (1 - 3 units)

Description: A culminating experience for majors involving a substantive project that demonstrates a synthesis of learning accumulated in the major, including broadly comprehensive knowledge of the discipline and its methodologies. Senior standing required.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Independent Study Required

Course typically offered:

Main Campus: Fall, Spring

GENE 499: Independent Study (1 - 6 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Alternative Grading: S, P, F

Career: Undergraduate

Course Components: Independent Study Required

Course typically offered:

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 500: Computer Concepts and Perl Programming (3 units)

Description: Basic Perl programming with applications to biology and fundamental computer concepts that are necessary to efficiently utilize computers in biological research. Graduate-level requirements include writing two functional specifications.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: BIOC 500, ECOL 500, GENE 500, PLS 500

Also offered as: MCB 500, PLS 500

Co-convened with:

Course typically offered:

Main Campus: Fall

Home department: Molecular & Cellular Biology

Interdisciplinary Interest Area: BIOC - Biochemistry

Interdisciplinary Interest Area: ECOL - Ecology & Evolution Bio

GENE 509C: Statistics for Research (3 units)

Description: Statistical concepts and methods applied to research in other scientific disciplines. Principles of estimation and hypothesis testing for standard one-and two-sample procedures. Correlation, linear regression. Contingency tables and analysis of variance.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: GENE 509C, PCOL 509C

Also offered as: MATH 509C, PCOL 509C

Course typically offered:

Main Campus: Spring (even years only)

Recommendations and additional information: MATH 112.

Home department: Mathematics

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 513: Statistical Genetics for Quantitative Measures (3 units)

Description: This course provide the student with the statistical tools to describe variation in quantitative traits, particularly the decomposition of variation into genetic, environmental, and gene by environment interaction components. Covariance (resemblance) between relatives and heritability will be discussed, along with the topics of epistasis, oligogenic and polygenic traits, complex segregation analysis, methods of mapping quantitative trait loci (QTL), and estimation procedures. Microarrays have multiple uses, each of which will be discussed and the corresponding statistical analyses described.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: EPI 513, EPID 513, GENE 513

Also offered as: ACBS 513, EPID 513

Course typically offered:

Main Campus: Fall

Recommendations and additional information: A basic genetic principles course as ANS 213, GENE 433, GENE 533, or GENE 545. A current course on basic statistical principles as GENE 509C or MATH 509C. A course in linear models as MATH 561 and in statistical inference mathematics.

Home department: School of Animal & Comparative Biomedical Sciences

GENE 525: Speciation (2 units)

Description: [Taught alternate years 1999 - 2000] Mechanisms of evolution in the formation of races and species of animals and plants.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Repeatable: Course can be repeated a maximum of 2 times.

Equivalent to: GENE 525

Also offered as: ECOL 525

Course typically offered:

Main Campus: Spring

Recommendations and additional information: ECOL 320.

Home department: Ecology & Evolutionary Biology

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 526: Population Genetics (3 units)

Description: General introductory course on empirical and theoretical population genetics. It will involve two weekly lectures, weekly problem sets, and regular readings from the primary literature. A major goal of this course is to make students familiar with basic models of population genetics and to acquaint students with empirical tests of these models. As much as any field of biology, population genetics has been divided into a theoretical and an empirical branch. However, these two bodies of knowledge are intimately related and this course will cover both in roughly equal amounts. We will discuss the primary forces and processes involved in shaping genetic variation in natural populations (mutation, drift, selection, migration, recombination, mating patterns, population size and population subdivision), methods of measuring genetic variation in nature, and experimental tests of important ideas in population genetics. The course will also cover a few more specialized topics such as transposable elements, the evolution of multigene families, and molecular clocks. Graduate-level requirements include additional exam questions, additional readings from the literature, and presentation of a 15 minute overview and synthesis of a specialized topic in population genetics.

Grading basis: Regular Grades

Career: Graduate

Flat Fee: \$50

Course Components: Lecture Required

Equivalent to: GENE 526

Also offered as: ECOL 526

Co-convened with: GENE 426

Home department: Ecology & Evolutionary Biology

GENE 530: Conservation Genetics (3 units)

Description: Basic methods and theories of genetic/genomic analyses together with the application of these analyses to promote conservation, proper management, and long term survival of free-ranging species, including the exploration of current conservation genetic/genomic literature. Graduate level requirements include a term project and an oral presentation.

Grading basis: Regular Grades

Career: Graduate

Course Components:	Lecture	Required
	Seminar	May Be Offered

Equivalent to: ECOL 530, GENE 530

Also offered as: ECOL 530, WFSC 530

Co-convended with: GENE 430

Course typically offered:

Main Campus: Fall

Recommendations and additional information: ECOL 320, PLS 312, basic genetics class, or consent of instructor.

Home department: School of Natural Resources and the Environment

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 530L: Conservation Genetics Lab (1 unit)

Description: This course is offered to meet the needs of students wanting to work in conservation genetics and to provide a genetic perspective to students working in other areas of conservation biology. The two primary goals of the class are to give students first-hand experience in a conservation genetics lab and to publish a research paper as a class. This is a laboratory based course with an emphasis on producing useful conservation related data and subsequently publishing our results. The class will be structured to mirror the steps involved in taking a research project from an idea all the way through to publication. Emphasis will be primarily on the lab work, data analyses, and writing and review process, though grant writing and sample collection will be introduced. Graduate students will have additional paper-editing and laboratory duties.

Grading basis: Regular Grades

Career: Graduate

Course Components: Laboratory Required

Also offered as: ECOL 530L, WFSC 530L

Co-convened with: GENE 430L

Course typically offered:

Main Campus: Fall

Home department: School of Natural Resources and the Environment

Enrollment requirement: Concurrent enrollment in WFSC/GENE/ECOL 530 required.

GENE 539: Methods in Cell Biology and Genomics (3 units)

Description: In-depth, practical and theoretical analysis of novel, experimental methods that advance our understanding of modern biology.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Also offered as: MCB 539, PCOL 539, PLS 539, PSIO 539

Course typically offered:

Main Campus: Fall (even years only)

Home department: School of Plant Science

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 549A: Plant Genetics and Genomics (3 units)

Description: A 3-unit lecture/discussion course that provides an advanced treatment of the current knowledge and experimental approaches used in genetic and genomic analysis, with emphasis on plants. Basic understanding of Mendelian genetics, gene and genome structure and function is required. Graduate-level requirements include leading 3 course discussions on review articles and problem sets and write a paper based on each of the three research discussions that they lead.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: ECOL 549A, GENE 549A, MCB 549A

Also offered as: ECOL 549A, MCB 549A, PLS 549A

Co-convened with:

Home department: School of Plant Science

GENE 568: Nucleic Acids, Metabolism, and Signaling (4 units)

Description: Chemistry, structure, and function of nucleic acids; replication, transcription translation, gene organization, regulation of gene expression and organelle nucleic acids. Both prokaryotic and eucaryotic systems will be considered.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: BIOC 568B, GENE 568, GENE 568B, INSC 568, MCB 568, MCB 568B, NFS 568, N_SC 568

Also offered as: BIOC 568

Course typically offered:

Main Campus: Fall

Recommendations and additional information: BIOC 411 or consent of instructor.

Home department: Chemistry and Biochemistry

Interdisciplinary Interest Area: MCB - Molecular & Cell Biology

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 573: Recombinant DNA Methods and Applications (4 units)

Description: This course offers an intensive lab experience to teach students the practical and theoretical aspects of modern molecular biology. In the first part of the course, recombinant DNA methods and bioinformatics are used to clone and identify an unknown gene. In the second part of the course DNA microarray technology is used to determine the effect of environmental stress on the global gene expression program in yeast, and to identify genes that control the stress response. Weekly lectures compliment the lab sessions, covering the theory and principles underlying the experiments performed during the course. Graduate level requirements will include additional assignments, such as presenting and discussing research papers applicable to the lab projects or recent advances in molecular biology techniques.

Grading basis: Regular Grades

Career: Graduate

Flat Fee: \$150

Course Components:

Discussion	Required
Lecture	Required

Equivalent to: BIOC 573, GENE 573, MIC 573, MICR 573, PLS 573

Also offered as: BIOC 573, MCB 573, MIC 573, PLS 573

Course typically offered:

Main Campus: Spring

Home department: Molecular & Cellular Biology

Enrollment requirement: (MCB 181R and 181L) or MCB 184.

GENE 594: Practicum (1 - 3 units)

Description: The practical application, on an individual basis, of previously studied theory and the collection of data for future theoretical interpretation.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components:

Independent Study	Required
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Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 595H: Problems in the Biology of Complex Diseases (2 units)

Description: Complex diseases (CDs: e.g., asthma, allergy, COPD, obesity, inflammatory bowel disease, hypertension, coronary artery disease, diabetes, rheumatoid arthritis, multiple sclerosis, schizophrenia) are the next major challenge in human biology because they are at the same time unique, common and difficult to decipher. The complexity of CDs lies in their pathogenesis, in which a constellation of environmental and genetic factors interact in intricate ways to alter biological thresholds and response patterns, modifying disease susceptibility. Since both genes and environmental exposures contribute to CDs, the biological pathways involved in CD pathogenesis depend on the genetic background of a given population and the specific environment to which that population is exposed. Hence, asthma, obesity and hypertension in Arizona may not be the same as asthma, obesity and hypertension in Iceland.

Grading basis: Regular Grades

Career: Graduate

Course Components: Colloquium Required

Equivalent to: GENE 595H, IMB 595H, MCB 595H

Also offered as: CMM 595H, IMB 595H, MCB 595H, PCOL 595H

Course typically offered:

Main Campus: Spring

Home department: Cellular & Molecular Medicine

GENE 599: Independent Study (1 - 6 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Course typically offered:

Main Campus: Fall, Spring, Summer

GENE 670: Recent Advances in Genetics (2 units)

Description: Recent advances in the field of genetics.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Repeatable: Course can be repeated a maximum of 99 times.

Equivalent to: ECOL 670

Also offered as: ECOL 670

Course typically offered:

Main Campus: Fall, Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 677: Principles of Genetic Association Studies (3 units)

Description: Lectures, forum discussions, and laboratory activities. Topics: selection of appropriate study design for association studies; understanding basic molecular genetics with particular focus on the genetic code; selection of candidate genes; genotype analysis; temporal sequence in genetic association studies; importance of longitudinal data in genetic association studies; genotype versus haplotype analysis; selection of haplotype tagging SNPs; use of genetic software.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: CPH 677

Also offered as: EPID 677

Course typically offered:

Main Campus: Spring

Recommendations and additional information: EPID 573A, BIOS/EPID 576A.

Home department: Epidemiology and Biostatistics

GENE 695D: Human Genetic Disease Colloquium (3 units)

Description: The course will cover a few medical genetic disorders in depth, with different topics each year. Clinical presentation, pathophysiology, genetic mechanisms and biochemical features will be considered. Readings will come mainly from the primary biomedical literature.

Grading basis: Regular Grades

Career: Graduate

Course Components: Colloquium Required

Repeatable: Course can be repeated a maximum of 4 times.

Equivalent to: BIOC 695D, GENE 695D, MCB 695D, NRSC 695D, PSIO 695D

Also offered as: BIOC 695D, CMM 695D, MCB 695D, NRSC 695D, PSIO 695D

Course typically offered:

Main Campus: Spring

Home department: Cellular & Molecular Medicine

GENE 699: Independent Study (1 - 4 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

GENE 795A: Laboratory Research Rotation (1 - 3 units)

Description: Students are exposed to research areas in Genetics and potential advisors. Brief report of rotation accomplishments must be submitted with faculty's signature at end of each rotation. Minimum 45 contact hours required for each credit unit.

Grading basis: Regular Grades

Career: Graduate

Course Components: Laboratory Required

Repeatable: Course can be repeated for a maximum of 12 units.

Course typically offered:

Main Campus: Fall, Spring

Recommendations and additional information: Limited to Genetics major and minor graduate students.

GENE 900: Research (1 - 9 units)

Description: Individual research, not related to thesis or dissertation preparation, by graduate students.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

GENE 910: Thesis (1 - 8 units)

Description: Research for the master's thesis (whether library research, laboratory or field observation or research, artistic creation, or thesis writing). Maximum total credit permitted varies with the major department.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

GENE 920: Dissertation (1 - 9 units)

Description: Research for the doctoral dissertation (whether library research, laboratory or field observation or research, artistic creation, or dissertation writing).

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.