Genetics, B.S.

Genetics pervades every aspect of modern society, from newspaper articles to talk shows, from discussions on health care to discussions on cloning. With the sequencing of the human genome, it is more important than ever for biology students to have a broad background in the study of heredity and evolution. The Genetics major is designed to benefit motivated undergraduates who have a particular interest in learning about developmental genetics, evolutionary genetics, and molecular genetics and to allow them to explore how our knowledge of genetic mechanisms contributes to our understanding of human development and disease. The Genetics major will accommodate students interested in the study of inheritance either as a basic discipline or in terms of its applied aspects in biotechnology, medicine, and agriculture, but will be especially attractive to those students desiring focused study and preparation for graduate training.

Genetics majors begin their study in the junior year with three required major courses (BIO SCI D103 , BIO SCI D104 and BIO SCI D113). In addition to these required major courses, students will choose six additional upper-division Biology Elective courses. Certain courses are designed to give students an understanding of genetic mechanisms and teach them how to define and answer fundamental questions in biomedical research. Additionally, students choose at least two electives that deal with topics such as the molecular biology of cancer, human genetic diseases, developmental genetics, and the genetics of aging. Finally, Genetics majors are encouraged to explore laboratory research by enrolling in BIO SCI 199 . Laboratory research not only expands a student's technical skills, but is also designed to allow faculty members to mentor Genetics majors. All students majoring in Genetics have a faculty advisor with whom they meet at least quarterly. The faculty advisor helps students plan their curriculum and select appropriate Biological Sciences 199 research projects. Genetics majors also have an opportunity to meet with other Genetics majors on a regular basis and participate in research talks.

The Genetics major provides graduates with advanced training in the skills necessary to pursue graduate degrees in biomedical research. These include Ph.D. graduate programs, teacher-training programs, medical school, and veterinary school. Genetics graduates may also use their backgrounds effectively in planning careers in law, business, education, and public affairs.

Application Process to Declare the Major: The major in Genetics is open to junior- and senior-level students only. Applications to declare the major can be made at any time. Information can also be found at the UCI Change of Major Criteria (http://www.changeofmajor.uci.edu/). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

All students must meet the University Requirements (http://catalogue.uci.edu/informationforadmittedstudents/requirementsforabachelorsdegree/).

All students must meet the School Requirements (http://catalogue.uci.edu/schoolofbiologicalsciences/#schoolrequirementstext).

Major Requirements

A. Required Major Courses:	
BIO SCI D103	Cell Biology
BIO SCI D104	Developmental Biology
BIO SCI D113	Genetics Majors Seminar
B. Upper-Division Laboratories:	
Select three of the following: [1]	
BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E106L	Habitats and Organisms
BIO SCI E112L	Physiology Laboratory
BIO SCI E115L	Evolution Laboratory
BIO SCI E131L	Image Analysis in Biological Research
BIO SCI E140L	Evolution and the Environment Laboratory
BIO SCI E160L	Biology of Birds Lab
BIO SCI E166L	Field Biology
BIO SCI E179L	Field Freshwater Ecology
BIO SCI M114L	Biochemistry Laboratory
BIO SCI M116L	Molecular Biology Laboratory
BIO SCI M118L	Experimental Microbiology Laboratory
BIO SCI M121L	Advanced Immunology Laboratory
BIO SCI M130L	Advanced Molecular Lab Techniques
BIO SCI N113L	Neurobiology Laboratory
C. Upper-Division Biology Electives:	

Select two of the following:	
BIO SCI D132	Introduction to Precision Medicine
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI D145	Genomics, Development, and Medicine
BIO SCI D148	Development and Disease
BIO SCI M137	Microbial Genetics
Select one from the following:	
BIO SCI D133	Advances in Regenerative Medicine
BIO SCI D135	Cell Biology of Human Disease
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI D148	Development and Disease
BIO SCI E153	Functional and Structural Evolutionary Genomics
BIO SCI N152	Developmental Neurobiology
Select three from the following:	
BIO SCI D105	Cell, Developmental, and Molecular Biology of Plants
BIO SCI D130	Photomedicine
BIO SCI D136	Human Anatomy
BIO SCI D138	Critical Thinking in Cell Biology
BIO SCI D170	Applied Human Anatomy
BIO SCI D190	Topics in Developmental and Cell Biology
BIO SCI E109	Human Physiology
BIO SCI M114	Advanced Biochemistry
BIO SCI M116	Advanced Molecular Biology
BIO SCI M125	Molecular Biology of Cancer
BIO SCI M143	Human Parasitology
BIO SCI M144	Cell Organelles and Membranes
BIO SCI N110	Neurobiology and Behavior
BIO SCI N151	Neurobiology of Aging
BIO SCI N154	Molecular Neurobiology

NOTE: No course may be used to satisfy more than one requirement.

[1] Students may petition to substitute Excellence in Research (BIO SCI 199) for two upper-division laboratories; 199 research is strongly encouraged. The 199 laboratory must be approved by the Department, and Excellence in Research must be successfully completed. Final approval is given by the Department.

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Freshman		
Fall	**Winter**	**Spring**
BIO SCI 93	BIO SCI 94	MATH 5A
CHEM 1A	CHEM 1B	CHEM 1C- 1LC
Lower-Division Writing[1]	Lower-Division Writing[1]	Lower-Division Writing[1]
BIO SCI 2A		
Sophomore		
Fall	**Winter**	**Spring**
BIO SCI 97	BIO SCI 98	BIO SCI 99
CHEM 51A	CHEM 51B- 51LB	CHEM 51C- 51LC
MATH 5B	General Education	STATS 7, 8, MATH 2D, or MATH 3A
CHEM 1LD		
Junior		
Fall	**Winter**	**Spring**
BIO SCI D103	BIO SCI D104	U-D Lab or BIO SCI 199

PHYSICS 3A	PHYSICS 3B- 3LB	PHYSICS 3C- 3LC
BIO SCI 100	U-D Bio. Sci. elective	U-D Bio. Sci. elective
General Education	BIO SCI D113	
	General Education	
Senior		
Fall	**Winter**	**Spring**
U-D Lab or BIO SCI 199	U-D Lab or BIO SCI 199	U-D Bio. Sci. elective
U-D Bio. Sci. elective	U-D Bio. Sci. elective	U-D Bio. Sci. elective
General Education	General Education	General Education

[1] Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 40, WRITING 50, WRITING 60 in order to fulfill the lower-division writing requirement.

- Developmental and Cell Biology, B.S.