

Concentration in

Cell Biology and Development

The fields of cell and developmental biology aim to discover the functions and activities of cells, and how these cells function in concert to develop functional organisms. Cells vary incredibly in form and function, from free-living bacterial spirochetes to meter-long motor neurons. Cell biology focuses on the molecules and macromolecular structures in cells and their respective functions, the biochemistry of the reactions underlying a cell's function, and the ways in which cells interact and communicate with each other. Developmental Biology asks how single unspecialized cells differentiate and become more specialized and how groups of cells in multicellular organisms undergo morphogenesis, the process of anatomical structure formation. Fundamentally, the field of Developmental Biology seeks to understand the mechanisms by which organisms go from fertilized egg to functional, reproductive adult.

Courses in this concentration will explore the elaborate architecture of eukaryotic cells, the genetic and molecular basis of cell differentiation and morphogenesis, and the molecular biology of basic cell functions and organismal development. This concentration will provide excellent preparation for students interested in pursuing an allied health career or graduate studies in cell/molecular/developmental biology, direct entry into a research or technical position, or other careers. It is also a good choice for students who simply wish to understand how life works at the cellular level.

GENERAL BIOLOGY COURSE REQUIREMENTS FOR THE BIOLOGY BS DEGREE

- 1. BIOL 2000 Molecules and Cells**
- 2. BIOL 2010 Ecology and Evolution**
- 3. BIOL 2040 Investigations in Molecular Cell Biology**
- 4. Category A: Genetics and Genomics. Choose one course from the following**
 - BIOL 3050 Genetics
 - BIOL 3150 Introduction to Genomics
 - BIOL 3060 Introduction to Genetics (summer only)
- 5. Category B: Physiology and Organismal Biology. Choose one course from the following**
 - BIOL 3030 Introduction to Physiology
 - BIOL 3210 Plant Biology
 - BIOL 4110 Ornithology
 - BIOL 4330 Human Physiology
 - BIOL 4450 Behavioral Ecology
- 6. One Advanced Experience course (see current listing on the Biology Checklist)**

ADDITIONAL COURSE REQUIREMENTS TO COMPLETE A CONCENTRATION IN CELL BIOLOGY AND DEVELOPMENT

- 1. BIOL 3040 Cell Biology**
- 2. BIOL 4050 Evolution and Development OR BIOL 4320 Developmental Biology**
- 3. Choose THREE additional courses from the following list**

BIOL 4050 Evolution and Development	BIOL 4520 Molecular Biology of Exercise
BIOL 4140 Foundations in Microbiology	BIOL 4450 Neuroscience
BIOL 4220 Research in Molecular Cell Biology	BIOL 4460 Molecular basis of Disease
BIOL 4290 Medical Biochemistry and Metabolism	BIOL 4890 Investigations in Cellular Re-programming
BIOL 4320 Developmental Biology	BIOL 5010 Nobel Prize winning research
BIOL 4350 Biological Chemistry or	BIOL 5130 Environmental Disruptors of Development
CHEM 4461 Biochemistry I	BIOL 5040 Topics in Developmental Biology
BIOL 4400 Molecular Biology	BIOL 5420 Cancer as a Metabolic Disease
BIOL 4510 Cancer Biology	BIOL 5450 Advanced Lab for Cell Imaging

See the following faculty for advice about course selection and/or post-graduate research in this concentration:

Emrah Altindis	Tom Chiles	Marc-Jan Gubbels	Tom Seyfried
Anthony Annunziato	Rebecca Dunn	Laura Hake	Danielle Taghian
David Burgess	Eric Folker	Vicki Losick	Kenneth Williams