

UNDERGRADUATE STUDIES: BIOLOGY – EMPHASIS IN CELLULAR AND MOLECULAR BIOLOGY CHECKLIST

Preparation for the Major Coursework

See Department of Biology undergraduate advisers (LS-135)

Cell and molecular biology is the study of the macromolecules and mechanisms involved in basic biological processes. This discipline crosses traditional boundaries between genetics, biochemistry, cell biology, physics and chemistry. Graduates will have training appropriate for entry-level positions in the biotechnology industry, and the prerequisites for cell and molecular biology graduate programs. Students should obtain research experience through Biology 497/499 Special Studies (discuss with professors).

Four Year Degree

To finish your degree in four years, all 9 sets of premajor courses listed below will need to be finished by the end of your 4th semester, or the 5th at the latest

Impaction

Biology is impacted. After admission to SDSU, students are initially placed into the Biology premajor. Premajors must meet department specific criteria in order to be admitted into the major. Admission to Biology Major requires the following:

- Completion of all the preparation for the Major courses *and* a combined GPA of 2.8 or higher in these courses (*excluding Phys 180A, 180B, 182A, and 182B*).
- A minimum of C or better in every course (Recommended A's and B's).
- Courses in the Preparation for the Major cannot be taken Cr/Nc.

After completing these requirements, you will be admitted to the Major automatically. *If* you are not admitted automatically meet with the Undergraduate Biology Advisor as soon as possible.

Students who do not meet one or more requirements should meet with the Undergraduate Biology Advisor each semester to determine an appropriate course of action

NOTE: Not all upper division Biology courses are offered every semester. Check the current class schedule for complete course listings.

PREPARATION FOR THE MAJOR (37 units of lower division courses)

Biol 203	Princ. of Cell Molec. Biology	3		Chem 232	Organic Chemistry	3	
Biol 203L	Princ. of Cell Molec. Biology Lab	1		Chem 232L	Organic Chemistry Lab	1	
Biol 204	Princ. of Organismal Biology	3		Math 124	Calculus of Life Sciences	4	
Biol 204L	Princ. of Organismal Biology Lab	1		Phys 180A	Fundamentals of Physics	3	
Biol 215	Biostatistics	3		Phys 182A	Physical Measurements	1	
Chem 200	General Chemistry	5		Phys 180B	Fundamentals of Physics	3	
Chem 201	General Chemistry	5		Phys 182B	Physical Measurements	1	

No transfer courses will substitute for courses in the major without prior departmental approval.

¹ Only offered during Fall. See Biology Undergraduate Advisor to plan your coursework accordingly.

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UPPER DIVISION MAJOR

(36 units)

2.0 GPA required in all upper division coursework applied to the major.

Core Coursework (19 units)

Biol 352 Genetics and Evolution	3	Biol 366 Biochem, CMB II	4
Biol 354 Eco. and the Environment	3	Boil 366L Biochem, CMB Lab	2
Chem 365 Biochem CMB I	3	Biol 567 Biochem CMB III ¹	4

Elective Coursework (17 Units Minimum)

Required: Two courses must be taken from this list.

Biol 350	General Microbiology (4)^L	Biol 575	Molecular Basis of Heart Disease (3)
Biol 480	Clinical Hematology (3)	Biol 576	Developmental Biology (3)
Biol 490	Undergraduate Honors Research (3)	Biol 584	Medical Microbiology (3)
Biol 510	Molecular Evolution (3)	Biol 485	Principles of Immunology (3)
Biol 528	Microbial Ecology (3)^L	or 585	Cellular and Molecular Immunology (3)
Biol 549	Microbial Genetics and Physiology (3)	Biol 589	Stem Cell and Regenerative Biology (3)
Biol 554	Molecular Virology (3)	Biol 590	Physiology of Human Systems (4)
Biol 556	Scanning Electron Microscopy Lab (2) ^L	Chem 432	Organic Chemistry II (3)
Biol 557	Transmission Electron Microscopy Lab (3) ^L	Chem 432L	Organic Chemistry II Lab (1)
Biol 562	Ecological Metagenomics (3) ^L	Bio/Chem	Experimental topics/Selected Topics in
Biol 567L	Biochemistry, Cellular and Molecular Biology Lab II (2) ^L	496 and/or 596	Chemistry (1-3)
Biol 568	Bioinformatics (3)	(Max. 3	and/or
Biol 570	Neurobiology (3)	units)	Special Topics in Biology/Advanced special Topics in Chemistry (1-3)

Required: 2 Lab Courses (One class *cannot* fulfill both lab course requirements.)

1. Organismal Lab Requirement – select at least one Organismal lab in bold from below.		
2. Lab Elective Requirement – select at least one additional lab course from below		

Biol 350	General Microbiology (4)	Biol 525	Mammology (4)
Biol 354L	Genetics and Evolution (2)	Biol 526	Terrestrial Arthropod Biology (4)
Biol 436	Human Physiology Lab (2)	Biol 527L	Animal Behavior Lab (1)
Biol 458	Plant Biology (4)	Biol 528	Microbial Ecology (3)
Biol 480L	Clinical Hematology Laboratory (1)	Biol 530	Plant Systematics (4)
Biol 490	Undergraduate Honors Research (3)	Biol 531	Taxonomy of California Plants (4)
Biol 512	Evolutionary & Ecology of Marine Mammals (3)	Biol 535	Plant Ecology (4)
Biol 514	Biology of Algae (4)	Biol 540	Conservation Ecology (3)
Biol 515	Marine Invertebrate Biology (4)	Biol 544L	Global Change Science Lab (2)
Biol 516A	Marine Larval Ecology Research Pt.1 (4)	Biol 556	Scanning Electron Microscopy Lab (2)
Biol 516B	Marine Larval Ecology Research Pt.2 (4)	Biol 557	Transmission Electron Microscopy Lab (3)
Biol 517	Marine Ecology (4)	Biol 562	Ecological Metagenomics (3)
Biol 518	Biology of Fishes (4)	Biol 567L ¹	Biochemistry, Cellular and Molecular Biology Lab II (2)
Biol 523	Herpetology (4)	Biol 568	Bioinformatics (3)
Biol 524	Ornithology (4)	Biol 597A	Univariate Statistical Methods in Biology (3)

Custom Electives

- Customize your major by taking courses that you're interested in that are upper division Biology courses numbered 350-599 (except Biol 452) and upper division Chemistry courses (except Chem 300, 308, 497, 499, 560).
- Prior approval of the Biology Undergraduate Advisor (LSN-135) is needed and paperwork must be filed in order to enroll in Biol 497 and/or 499.
- A maximum of 6 units between Biol 497 and 499 may be applied to the major.
- Elective courses (including Chem 498, Biol and Chem 496 and 596) must be approved by the emphasis Advisor.

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