PREMEDICAL CONCENTRATION REQUIREMENTS

Course	Course Title	Prerequisites
MLO 1: MATHEMATICAL FOUNDATIONS: Students apply the fundamental mathematical and statistical constructs used to analyze, interpret, and communicate quantitative information.		
***Each of the following*:**		
MATH150	Calculus I	MATH130
MATH151	Calculus II	MATH150
STAT 100 OR 250	Intro to Statistics *OR* Applied Statistics for Scientists	For STAT100: MATH 99 OR ELMT SCORE 50 For STAT 250: MATH150; recommend 151
MLO 2: PHYSICAL SCIENCE FOUNDATIONS: Students use the nomenclature, concepts, and methodology of chemistry and physics to describe, measure, and predict the chemical and physical properties and processes of physical and biological systems.		
Each of the following:		
CHEM110/L	Chemistry I	CHEM109, MATH130 (Concurrent ok)
CHEM111/L	Chemistry II	CHEM110, CHEM110L, MATH130
CHEM211	Organic Chemistry I	CHEM111, CHEM111L
CHEM212	Organic Chemistry II	CHEM211
PHYS220/L	Physics I Mechanics	CHEM110 & MATH150
PHYS221/L	Physics II Elec, Magnetism, and Optics	MATH151 & PHYS220
MLO 3: BIOLOGICAL FOUNDATIONS: Students understand and describe the role of evolution as it applies to the diversity of life and life processes on earth, including molecular and cellular biology, genetics, organismal biology and ecology, and they apply basic scientific principles and methods to these biological processes.		
Each of the following:		
BIO240/L	Ecology, Evolution, & Biodiversity	CHEM110
BIO241/L	Cell & Molecular Biology	CHEM111/L & MATH130
BIO242/L	Plant & Animal Form & Function	BIO240, BIO240L, BIO241 & BIO241L
MLO 4: COMMUNICATION AND ETHICS IN BIOLOGY: Students identify, research, analyze, and present clearly, in oral and written formats, for scientific and non-scientific audiences, historical and current complex biological concepts in appropriate contexts. Students analyze their own and other ethical frameworks surrounding such issues.		
BIO300	Issues and Ethics in Biology	Eng Com A, Eng Com B, BIO240, BIO241
MLO 5: INFORMATION, TECHNOLOGY, AND SCIENTIFIC INQUIRY IN BIOLOGY: Students detect, describe, and observe patterns that emerge from the analysis of biological questions, use the scientific method to develop questions and test hypotheses, and demonstrate competence in the analysis and display of data.		
BIO310/L	Biochemistry	BIO241/ L, (CHEM210 or CHEM211)
MLO 6: ADVANCED KNOWLEDGE IN MOLECULAR AND CELLULAR BIOLOGY: Students apply scientific principles and methods to the study of molecular life processes and the structure and function of cells.		
BIO414	Molecular Cell Biology (formerly known as BIO314)	BIO 241/L, BIO242/L

PREMEDICAL CONCENTRATION REQUIREMENTS

MLO 7: Advanced Knowledge in Organismal Biology: Students apply biological principles and scientific methods to the study of one or more chosen areas of organismal biology.		
BIO320/L	Microbiology	BIO241/L, BIO242/L
MLO 8: Advanced Knowledge in Ecology, Evolution, or Genetics: Students apply advanced concepts in molecular and population genetics, evolution, or experimental and theoretical ecology to modern questions in biology.		
BIO311	Genetics	BIO241/L
MLO 9: Service in Biology: Students demonstrate the ability to share an understanding of biology with culturally, linguistically, economically, and technologically diverse communities.		
Choose one.		
BIO378S	Health Sciences Service Learning	None
BIO379S	Biology Education Service Learning	BIO242/L or Instructor consent
ENVS384S	Environmental Justice & Environmental Policy Service Learning	ENGCOM A, instructor consent
Note: BIO and ENVS courses with "S" designation also count towards two of CSUMB's Graduation Learning Outcomes and as upper-division general education.		
MLO 10: Biology Capstone: Students complete written and oral reports synthesizing their biology knowledge with their experiences in a course-based project, an internship, service learning project, independent research or other advisor-approved Capstone-level project.		
BIO490	Biology Capstone	BIO300 + at least 3 additional upper-division biology courses
Or these two classes may be substituted for BIO490 with advisor approval:		
ENVS400 & ENVS403	ENVS Capstone I And ENVS Capstone II	ESSP300 or ENVS300
And one of the following, which must be taken before BIO490 (may be double-counted in other MLOs):		
BIO344L	Environmental Biotech Lab	No Prerequisites
BIO460L	Yeast Genetics and Molecular Biology Lab	BIO241/L & (BIO314 or BIO414)
BIO497	Independent Study	Instructor Consent
ENVS440	Environmental Modeling	MATH151 & (BIO340 OR GEOL360)
PH420	Multi-Cultural Health Ed & Promot	None
CHHS450	Health/Social Policy Analysis	None
CONCENTRATION ELECTIVES:		
Two additional Electives from MLO 5, 6, 7, 8 or advisor-approved KIN, CHHS, or PH courses – at least one of which is 400 level or other classes with advisor's approval.		