CALIFORNIA STATE UNIVERSITY, LOS ANGELES

PROGRAM FOR THE BACHELOR OF SCIENCE DEGREE IN NATURAL SCIENCE
Interdisciplinary Science (Option I)

Student Name:_____ CIN:_____
Email address:_____ Phone:_____
GE Year / Major Year:_____ Advisor:_____

Requirements for this degree

The Bachelor of Science Degree in Natural Science provides broad training across several science disciplines and is offered as three options: Interdisciplinary Science (Option I), Teaching (Option II), and Applied Science (Option III). Natural Science majors choose one option. Majors choosing the Interdisciplinary Science or Teaching option must select an emphasis area in biology, chemistry, geoscience, or physics, and majors choosing the Applied Science option must select an emphasis area in food science or medical science. Students should speak with a Natural Science adviser before choosing an option.

- In each options students must earn a grade of C or higher in all courses that satisfy the following university, general education or major requirements.
- **Consult with an advisor for the specific number of units required in all areas of the degree including General Education, 40 upper-division unit graduation requirement, and elective units needed to complete the major.**

Option I - Bachelor of Science Degree in Natural Science - Interdisciplinary Science

The Interdisciplinary Science option of the Bachelor of Science degree in Natural Science is of value to those seeking careers where a broad science background is useful, including careers in academia, business, government, law, medicine, nonprofit organizations, and other fields. Students study multiple natural science disciplines (i.e., biology, chemistry, geoscience, and physics) and choose one area from biology, chemistry, geoscience, and physics as an emphasis area of study. Total number of units required for the degree is 120, of which 71-79 units are in the major depending on the emphasis selected.

The following worksheets show the major requirements for each of the emphasis areas, and the last page shows the GE and University requirements.

INTERDISCIPLINARY SCIENCE MAJOR REQUIREMENTS – BIOLOGY EMPHASIS

Requirement	Units	Transfer institution and equivalent course	Or Cal State L.A. course number and title	Term	Grade
CORE (39-46 units)					
Core requirements for all emphasis areas (18 units)					
BIOL 1100 – Principles of Biology I	5				
BIOL 1200 – Principles of Biology II	5				
MATH 2110 – Calculus I	4				
MATH 2120 – Calculus II	4				
Capstone course (3 units)					
NATS 4950 - Natural Science Field Studies	3				
Additional Core requirements based on Emphasis area (18-25 units) Students must **choose one emphasis area** from among biology, chemistry, geoscience, or physics as a focus of study that determines additional Core requirements specific to each emphasis area.					
Biology Emphasis (18-25 units) Choose three sets of courses from the following four sets:					
Set 1. ASTR 1510 - Principles of Astronomy	2				
ASTR 1520 - Principles of Astronomy: Laboratory	1				
Set 2. CHEM 1100 - General Chemistry I	5				
CHEM 1110 - General Chemistry II	5				
Set 3. GEOL 1500 - Earth Revealed	3				
GEOL 2520 - Historical Geology	4				
Set 4. PHYS 1100 - Physics A	4				
PHYS 1200 - Physics B	4				
EMPHASIS AREA (32 units)					
Students must choose the same emphasis area that was chosen to determine their CORE requirements					
Biology Emphasis (32 units)					
BIOL 3000 - Biostatistics	3				
BIOL 3200 - Professional Writing in the Biological Sciences	3				
BIOL 3400 - Cell Biology and Genetics	3				
BIOL 3800 - Ecology and Evolution	3				
CHEM 2200 - Organic Chemistry I	4				
MICR 3100 - General Microbiology	4				
Upper Division Electives (12 units) *Select upper division electives with advisor approval from the following*: upper division BIOL course(s), NATS 3980 - Field Observations in Science Education (1), NATS 4000 - Crosscutting Concepts in Natural Science (3), NATS 4200 - Cultures of Science (3). *A maximum of 3 units of directed study is allowed.*					
Elective					
Elective					
Elective					
Elective					
FREE ELECTIVES (3-10 units)					
Select lower and/or upper division electives with advisor approval. ***Completion of additional Core courses in ASTR (2,1 units), CHEM (5,5 units), GEOL (3,4 units) and/or PHYS (4,4 units) is strongly recommended.***					
Elective					
Elective					
Elective					
Elective					
TOTAL SEMESTER UNITS REQUIRED	81				

INTERDISCIPLINARY SCIENCE MAJOR REQUIREMENTS – CHEMISTRY EMPHASIS

Requirement	Units	Transfer institution and equivalent course	Or Cal State L.A. course number and title	Term	Grade
CORE (41-46 units)					
Core requirements for all emphasis areas (18 units)					
BIOL 1100 – Principles of Biology I	5				
BIOL 1200 – Principles of Biology II	5				
MATH 2110 – Calculus I	4				
MATH 2120 – Calculus II	4				
Capstone course (3 units)					
NATS 4950 - Natural Science Field Studies	3				
Additional Core requirements based on Emphasis area (18-25 units) Students must **choose one emphasis area** from among biology, chemistry, geoscience, or physics as a focus of study that determines additional Core requirements specific to each emphasis area.					
Chemistry Emphasis (20-25 units)					
CHEM 1100 – General Chemistry I	5				
CHEM 1110 – General Chemistry II	5				
Choose two sets of courses from the following three sets:					
Set 1. ASTR 1510 - Principles of Astronomy	2				
ASTR 1520 - Principles of Astronomy: Laboratory	1				
Set 2. GEOL 1500 - Earth Revealed	3				
GEOL 2520 - Historical Geology	4				
Set 3. PHYS 1100(2100 recommended) - Physics A	4				
PHYS 1200(2200 recommended) - Physics B	4				
EMPHASIS AREA (32 units)					
Students must choose the same emphasis area that was chosen to determine their CORE requirements					
Chemistry Emphasis (32 units)					
CHEM 2200 - Organic Chemistry I	4				
CHEM 3100 – Writing for Chemists	3				
CHEM 3200 - Organic Chemistry II	4				
CHEM 3500 - Quantitative Analysis	4				
CHEM 3600 - Introduction to Inorganic Chemistry	4				
CHEM 4300 - Introduction to Biochemistry	3				
Upper Division Electives (10 units): Select upper division electives with advisor approval from the following: upper division CHEM course(s), NATS 3980 - Field Observations in Science Education (1), NATS 4000 - Crosscutting Concepts in Natural Science (3), NATS 4200 - Cultures of Science (3). A maximum of 3 units of directed study is allowed.					
Elective					
Elective					
Elective					
Elective					
FREE ELECTIVES (3-8 units)					
Select lower and/or upper division electives with advisor approval. ***Completion of additional Core courses in ASTR (3 units), GEOL (3,4 units), and/or PHYS (8 units) is strongly recommended.***					
Elective					
Elective					
Elective					
Elective					
TOTAL SEMESTER UNITS REQUIRED	81				

INTERDISCIPLINARY SCIENCE MAJOR REQUIREMENTS – GEOSCIENCE EMPHASIS

Requirement	Units	Transfer institution and equivalent course	Or Cal State L.A. course number and title	Term	Grade
CORE (39-46 units)					
Core requirements for all emphasis areas (18 units)					
BIOL 1100 – Principles of Biology I	5				
BIOL 1200 – Principles of Biology II	5				
MATH 2110 – Calculus I	4				
MATH 2120 – Calculus II	4				
Capstone course (3 units)					
NATS 4950 - Natural Science Field Studies	3				
Additional Core requirements based on Emphasis area (18-25 units) Students must **choose one emphasis area** from among biology, chemistry, geoscience, or physics as a focus of study that determines additional Core requirements specific to each emphasis area.					
Geoscience Emphasis (18-25 units)					
GEOL 1500 - Earth Revealed	3				
GEOL 2520 - Historical Geology	4				
Choose two sets of courses from the following three sets:					
Set 1. ASTR 1510 - Principles of Astronomy	2				
ASTR 1520 - Principles of Astronomy: Laboratory	1				
Set 2. CHEM 1100 - General Chemistry I	5				
CHEM 1110 - General Chemistry II	5				
Set 3. PHYS 1100 - Physics A	4				
PHYS 1200 - Physics B	4				
EMPHASIS AREA (32 units)					
Students must choose the same emphasis area that was chosen to determine their CORE requirements					
Geoscience Emphasis (32 units)					
BIOL 3200 - Professional Writing in the Biological Sciences (3)	3				
GEOG 2680 - Introduction to Geospatial Sciences (4)	4				
GEOG 4100 - Applied Climatology (3)	3				
GEOL 3010 - Mineralogy and Petrology (3)	3				
GEOL 3210 - Geology of Southern California (3)	3				
GEOL 4350 - Coastal Processes and Environments (3)	3				
Upper Division Electives (13 units) *Select upper division electives with advisor approval from the following*: upper division GEOL or GEOG course(s), NATS 3980 - Field Observations in Science Education (1), NATS 4000 - Crosscutting Concepts in Natural Science (3), NATS 4200 - Cultures of Science (3). *A maximum of 3 units of directed study is allowed.*					
Elective					
Elective					
Elective					
Elective					
FREE ELECTIVES (3-10 units)					
Select lower and/or upper division electives with advisor approval. ***Completion of additional Core courses in ASTR (3 units), CHEM (5,5 units), and/or PHYS (8 units) is strongly recommended.***					
Elective					
Elective					
Elective					
Elective					
TOTAL SEMESTER UNITS REQUIRED	81				

INTERDISCIPLINARY SCIENCE MAJOR REQUIREMENTS – PHYSICS EMPHASIS

Requirement	Units	Transfer institution and equivalent course	Or Cal State L.A. course number and title	Term	Grade
CORE (41-44 units)					
Core requirements for all emphasis areas (18 units)					
BIOL 1100 – Principles of Biology I	5				
BIOL 1200 – Principles of Biology II	5				
MATH 2110 – Calculus I	4				
MATH 2120 – Calculus II	4				
Capstone course (3 units)					
NATS 4950 - Natural Science Field Studies	3				
Additional Core requirements based on Emphasis area (18-25 units) Students must **choose one emphasis area** from among biology, chemistry, geoscience, or physics as a focus of study that determines additional Core requirements specific to each emphasis area.					
Physics Emphasis (20-23 units)					
ASTR 1510 - Principles of Astronomy	2				
ASTR 1520 - Principles of Astronomy: Laboratory	1				
PHYS 2100 - Physics A	5				
PHYS 2200 - Physics B	5				
Choose one set of courses from the following two sets:					
Set 1. CHEM 1100 - General Chemistry I	5				
CHEM 1110 - General Chemistry II	5				
Set 2. GEOL 1500 - Earth Revealed	3				
GEOL 2520 - Historical Geology	4				
EMPHASIS AREA (35 units)					
Students must choose the same emphasis area that was chosen to determine their CORE requirements					
Physics Emphasis (35 units)					
CHEM 3100 - Writing for Chemists	3				
MATH 2130 - Calculus III	3				
PHYS 2300 - Modern Physics	4				
Upper Division Electives (25 units) *Select upper division electives with advisor approval from the following: upper division PHYS course(s), upper division MATH course(s), NATS 3980 - Field Observations in Science Education (1), NATS 4000 - Crosscutting Concepts in Natural Science (3), NATS 4200 - Cultures of Science (3). Must include one PHYS lab course. A maximum of two MATH courses is allowed. A maximum of 3 units of directed study is allowed.*					
Elective - PHYS laboratory course					
Elective					
Elective					
Elective					
Elective					
Elective					
Elective					
Elective					
FREE ELECTIVES (2-5 units)					
Select lower and/or upper division electives with advisor approval. ***Completion of additional Core courses in CHEM (5,5 units), and/or GEOL (3,4 units) is strongly recommended.***					
Elective					
Elective					
TOTAL SEMESTER UNITS REQUIRED	81				

GENERAL EDUCATION AND UNIVERSITY REQUIREMENTS

GE Block and Area	Units	Transfer institution and equivalent course	Or Cal State L.A. course number and title	Term	Grade
LOWER DIVISION (39 units)					
A. English Language Communication and Critical Thinking (9 units)					
A1 Oral Communication	3				
A2 Written Communication	3				
A3 Critical Thinking and Composition	3				
B. Scientific Inquiry and Quantitative Reasoning (9 units)					
Select three courses from at least two categories		NATS Option I majors satisfy by taking Core requirements for major			
B1 Physical Science with lab	6				
B2 Biological Science with lab					
B3 Interdisciplinary Physical-Biological Science					
B4 Quantitative Reasoning & Mathematical Concepts	3				
C. Arts and Humanities (9 units)					
C1 Arts	3				
C2 Humanities	3				
C AI U.S. History (American Institutions)	3				
D. Social Sciences (9 units)					
D	3				
D	3				
D AI U.S. Constitution and State/Local Govt (American Institutions)	3				
E. Lifelong Learning and Self-Development (3 units)					
IHE (cl)	3				
UPPER DIVISION (9 units) (at least one course designated (cl))					
B Natural Science and Quantitative Reasoning	3				
C Arts and Humanities	3				
D Social Sciences	3				
TOTAL SEMESTER UNITS REQUIRED	48				

Other Requirements	Units	Transfer institution and equivalent course	Or Cal State L.A. course number and title	Term	Grade
Diversity (d) or (re) (two courses, one course must be re)					
Writing Intensive (wi) (two courses) (NATS Option I majors satisfy by taking NATS 4950 and UD writing course in emphasis area)					
Civic Learning (cl) (upper division GE course)					
Graduation Writing Assessment Requirement (must be satisfied prior to completion of 90 semester units)					