

# COMPUTATIONAL SCIENCE MINOR - BIOLOGY/ ENVIRONMENTAL SCIENCE (BIOLOGY)

## Courses for Biology/Environmental Science Emphasis

### Biology Major

Code	Title	Units
<b>Lower-Division Requirements</b>		
BIO 2011 and BIO 2011L	Ecological and Evolutionary Systems (FE) and Ecological and Evolutionary Systems Laboratory (FE)	4
CSC 1043 and CSC 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
<b>Upper-Division Requirements</b>		
BIO 3063 and BIO 3063L	Conservation Ecology and Conservation Ecology Laboratory	4
CSC 3002	UNIX and Python Scripting for Computational Science	2
CSC 3011 or CSC 3031	Machine Learning and Multivariate Modeling in R Data Visualization and Communication with R	1
<b>Project</b>		
Choose at least three (3) units from the following:		3
CSC 4133	Service Learning in Computer Science	
HON 4098 and HON 4099	Honors Project I and Honors Project II	
MTH 4133	Service Learning in Mathematics	
<b>Biology Major - Required Courses</b>		
CSC 3022	Data Management for Computational Science	2
MTH 1044	Calculus with Applications (FE)	4
MTH 3063	Calculus Based Statistics with R	3
<b>Total Units</b>		<b>26</b>

### Computer Science Major

Code	Title	Units
<b>Lower-Division Requirements</b>		
BIO 2011 and BIO 2011L	Ecological and Evolutionary Systems (FE) and Ecological and Evolutionary Systems Laboratory (FE)	4
CSC 1043 and CSC 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
<b>Upper-Division Requirements</b>		
BIO 3063 and BIO 3063L	Conservation Ecology and Conservation Ecology Laboratory	4
CSC 3002	UNIX and Python Scripting for Computational Science	2
CSC 3011 or CSC 3031	Machine Learning and Multivariate Modeling in R Data Visualization and Communication with R	1
<b>Project</b>		

Choose at least three (3) units from the following: 3

CSC 4133	Service Learning in Computer Science	
HON 4098 and HON 4099	Honors Project I and Honors Project II	
MTH 4133	Service Learning in Mathematics	

### Computer Science Majors - Required Courses

ISS 4014	Data Base Systems and Web Integration	4
MTH 1064 and MTH 1064L	Calculus I (FE) and Calculus I Lab (FE)	4
MTH 3063 or MTH 3083	Calculus Based Statistics with R Mathematical Probability and Statistics	3

**Total Units** 28

### Mathematics Major

Code	Title	Units
<b>Lower-Division Requirements</b>		
BIO 2011 and BIO 2011L	Ecological and Evolutionary Systems (FE) and Ecological and Evolutionary Systems Laboratory (FE)	4
CSC 1043 and CSC 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
<b>Upper-Division Requirements</b>		
BIO 3063 and BIO 3063L	Conservation Ecology and Conservation Ecology Laboratory	4
CSC 3002	UNIX and Python Scripting for Computational Science	2
CSC 3011 or CSC 3031	Machine Learning and Multivariate Modeling in R Data Visualization and Communication with R	1
<b>Project</b>		
Choose at least three (3) units from the following:		3
CSC 4133	Service Learning in Computer Science	
HON 4098 and HON 4099	Honors Project I and Honors Project II	
MTH 4133	Service Learning in Mathematics	
<b>Mathematics Majors - Required Courses</b>		
CSC 3022	Data Management for Computational Science	2
MTH 1064 and MTH 1064L	Calculus I (FE) and Calculus I Lab (FE)	4
MTH 3083	Mathematical Probability and Statistics	3
<b>Total Units</b>		<b>26</b>