

# COMPUTATIONAL SCIENCE MINOR - CHEMISTRY (MATHEMATICS AND COMPUTER SCIENCE)

A minor in Computational Science is offered to those who wish to combine their knowledge of Biology, Chemistry, Physics or Psychology with Mathematics and Computer Science. This minor allows students to have the skills to work in cross disciplinary teams to solve challenging scientific problems. This minor is intended for students majoring in Biology, Chemistry, Computer Science, Mathematics, Physics or Psychology.

## Core Courses for Chemistry Emphasis Chemistry Major

Code	Title	Units
<b>Lower-Division Requirements</b>		
CHE 1052 and CHE 1052L	General Chemistry I (FE) and General Chemistry I Lab (FE)	5
CHE 1053 and CHE 1053L	General Chemistry II and General Chemistry II Lab	4
CSC 1043 and CSC 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
MTH 1064 and MTH 1064L	Calculus I (FE) and Calculus I Lab (FE)	4
<b>Upper-Division Requirements</b>		
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>Chemistry Major - Required Courses</b>		
CHE 2013	Analytical Chemistry	3
CHE 3025 and CHE 3025L	Physical Chemistry I and Physical Chemistry I Lab	4
CSC 3022	Data Management for Computational Science	2
MTH 3063 or MTH 3083	Calculus Based Statistics with R Mathematical Probability and Statistics	3
<b>Total Units</b>		<b>34</b>

## Computer Science Majors

Code	Title	Units
<b>Lower-Division Requirements</b>		
CHE 1052 and CHE 1052L	General Chemistry I (FE) and General Chemistry I Lab (FE)	5
CHE 1053 and CHE 1053L	General Chemistry II and General Chemistry II Lab	4

CSC 1043 and CSC 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
MTH 1064 and MTH 1064L	Calculus I (FE) and Calculus I Lab (FE)	4
<b>Upper-Division Requirements</b>		
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>Computer Science Majors - Required Courses</b>		
ISS 4014	Data Base Systems and Web Integration	4
MTH 3063 or MTH 3083	Calculus Based Statistics with R Mathematical Probability and Statistics	3
<b>Total Units</b>		<b>29</b>

## Mathematics Majors

Code	Title	Units
<b>Lower-Division Requirements</b>		
CHE 1052 and CHE 1052L	General Chemistry I (FE) and General Chemistry I Lab (FE)	5
CHE 1053 and CHE 1053L	General Chemistry II and General Chemistry II Lab	4
CSC 1043 and CSC 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
MTH 1064 and MTH 1064L	Calculus I (FE) and Calculus I Lab (FE)	4
<b>Upper-Division Requirements</b>		
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>		
CHE 2013	Analytical Chemistry	3
CHE 3025 and CHE 3025L	Physical Chemistry I and Physical Chemistry I Lab	4
CSC 3022	Data Management for Computational Science	2
MTH 3083	Mathematical Probability and Statistics	3
<b>Total Units</b>		<b>34</b>