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

## **Core Courses for Chemistry Emphasis Chemistry Major**

Units

Title

Code

oode	ride	Ullits
Lower-Division Requirements		
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 Re</b>	equirements	
CSC 3002	UNIX and Python Scripting for Computational Science	2
CSC 3011	Machine Learning and Multivariate Modeling in R	1
or CSC 3031	Data Visualization and Communication with R	
Project		
Choose at least th	ree (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	
Chemistry Major -	Required Courses	
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	Calculus Based Statistics with R	3
or MTH 3083	Mathematical Probability and Statistics	
Total Units		34

## **Computer Science Majors**

Science

Code	Title	Units
Lower-Division R	equirements	
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
Upper-Division Re	equirements	
CSC 3002	UNIX and Python Scripting for Computational	2

l ower-Division Re	auiromente.	
Code	Title	Units
Mathematics I	Majors	
Total Units		29
or MTH 3083	Mathematical Probability and Statistics	
MTH 3063	Calculus Based Statistics with R	3
ISS 4014	Data Base Systems and Web Integration	4
Computer Science	Majors - Required Courses	
MTH 4133	Service Learning in Mathematics	
HON 4098 and HON 4099	Honors Project I and Honors Project II	
CSC 4133	Service Learning in Computer Science	
Choose at least th	ree (3) units from the following:	3
Project		
or CSC 3031	Data Visualization and Communication with R	
CSC 3011	Machine Learning and Multivariate Modeling in F	1

	Mathematics	Majors	
	Code	Title	Units
	Lower-Division Requirements		
	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 Re</b>	equirements	
	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	R 1
	Project		

To	otal Units		34
M	ITH 3083	Mathematical Probability and Statistics	3
C	SC 3022	Data Management for Computational Science	2
_	HE 3025 nd CHE 3025L	Physical Chemistry I and Physical Chemistry I Lab	4
С	HE 2013	Analytical Chemistry	3
Mathematics Majors - Required Courses			
	MTH 4133	Service Learning in Mathematics	
	HON 4098 and HON 4099	Honors Project I and Honors Project II	
	CSC 4133	Service Learning in Computer Science	

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