

# CHEMISTRY ACCELERATED DUAL DEGREES, B.S./ M.S.

Credits: 152  
CIP Code: 400501

## Program Description

The Accelerated Dual Degrees in Bachelor of Science and Master of Science in Chemistry program trains and develops scholars and promotes research by providing students with contemporary concepts in the fields of organic, inorganic, and physical chemistry. Each student receives thorough intellectual training in a particular specialty and mastery of the methods that are requisite for productive scholarly endeavors in that specialty.

## Admissions Requirements

Applicants to the Accelerated Dual Degrees in Bachelor of Science and Master of Science in Chemistry must meet the General Admissions Requirements as published in the Undergraduate and Graduate Catalogs. Students are admitted based on their academic achievement in secondary school. Students must have a minimum cumulative high school grade point average of 3.25 and minimum scores of 900 on the composite Scholastic Assessment Test (SAT) or 22 on the American College Testing (ACT).

## Student Learning Outcomes

Graduates of the Accelerated Dual Degrees in Bachelor of Science and Master of Science Chemistry Program will be able to:

1. Discuss atomic and molecular theories of chemistry.
2. Demonstrate mastery of basic chemistry principles through written research papers and required oral presentations in seminar or research classes.
3. Interpret observations and tests and analyze a specific hypothesis through completion of individual research experiences.
4. Demonstrate proficiency in basic chemistry techniques required to conduct research.
5. Communicate scientific information effectively through the preparation of technical reports or a thesis.

## Degree Requirements

In addition to the General Degree Requirements as published in the Undergraduate and Graduate Catalogs, students must satisfy all the requisite major and cognate courses in order to be awarded the Bachelor of Science Degree in Chemistry. Students must complete a minimum of thirty (30) credits of graduate courses in the major field including an acceptable thesis.

At the beginning of the second semester of the third year of study, students must apply for admission to the graduate program. During their fourth year of study, students may begin graduate coursework and research while completing undergraduate degree requirements. Summer research activities may be required depending on the objectives of the students' research projects. During the fifth year of study, students engage exclusively in graduate study.

Students must complete all undergraduate chemistry courses with a minimum final grade of "C".

Students must maintain a minimum cumulative grade point average of 3.0 to continue in the program and complete the following courses as noted for the BS degree:

Code	Title	Hours
<b>Required Undergraduate Courses</b>		
CCHE 111	Gen Chem 1 & Recitation	4
CCHE 111L	General Chemistry Lab	0
CCHE 111R		0
CCHE 112	Gen Chem II Lec & Recitation	4
CCHE 112L	General Chemistry II Lab	0
CCHE 112R		0
CCHE 211	Analytical Chemistry I	4
CCHE 211L	Analytical Chemistry Lab	0
CCHE 231	Organic Chemistry	4
CCHE 231L	Organic Chemistry Lab	0
CCHE 231R	Organic Chemistry Recitation	0
CCHE 232	Organic Chemistry	4
CCHE 232L	Organic Chemistry Lab	0
CCHE 232R	Organic Chemistry Recitation	0
CCHE 341	Physical Chemistry I	3
CCHE 341L	Physical Chemistry Lab	1
CCHE 341R	Physical Chemistry Recitation	0
CCHE 342	Physical Chemistry II	3
CCHE 342L	Physical Chemistry Lab	1
CCHE 342R		0
<b>Cognate Courses</b>		
CMAT 111	Calculus I	4
CMAT 112	Calculus II	4
CMAT 211	Calculus III	4
CBIO 111	General Biology I & Lab	4
CBIO 111L		0
CMAT 212	Differential Equations	3
CPHY 121 & 121L	Physics I: Mechanics and Physics I: Mechanics Lab	4
CPHY 123 & 123L	Physics III: Optics/Modern Phys and Physics III: Optics&Mod.PhyLab	4
<b>Total Hours</b>		<b>55</b>

## General Education Courses

Code	Title	Hours
<b>Area A: Humanities/Fine Arts</b>		
Select one of the following:		3
CPHI 105	Critical Thinking	
CPHI 221	Introduction to Philosophy	
CREL 101	The Biblical Heritage	
CREL 103	Afr Amer Religious Experiences	
CREL 104	Afr Amer Religious Experience	
CREL 250	Comparative Religion	
CREL 251		
CART 150	Art Appreciation	
CHUM 228		
CHUM 230		

CMUS 119	World Music
CMUS 120	Music Appreciation
CSTA 252	Theater Appreciation
CHIS 201	United States, Africa & World
CHIS 211	History of the United States
CHIS 202	United States, Africa & World
CHIS 212	History of the United States

**Area B: Social/Behavioral Sciences**

Select two of the following: 6

CPSY 211	General Psychology
CPSY 218	Human Growth & Development
CEDU 301	(Education majors take this course)
CSCJ 215	Intro. to Sociology
CSCJ 216	Intro. to Anthropology
CSCJ 218	Contemporary Social Problems
CSCJ 219	Social Movements

**Area C: Natural Sciences/Mathematics/Statistics**

CMAT 111	Calculus I	4
CBIO 111	General Biology I & Lab	4
CBIO 111L		0

**Area D: Communications**

CENG 105	College Composition I	3
CENG 106	College Composition II	3

**Area E: Financial and Technological**

CCIS 253	Intro. to Comp. Sim/Analysis	4
CBUS 250	Personal Finance	3
or CECO 250	Principles of Economics	

**Total Hours** 30**Other University Requirements**

Code	Title	Hours
CGED 100	First Year Seminar	1
CGED 101	1st-Year Seminar	1

**Total Hours** 2**Free Electives: 15 Credits**

**Note:** Free electives should be chosen in consultation with the advisor depending on the choice of minor or stackable credentials being sought.

**Undergraduate Advanced Courses**

Code	Title	Hours
CCHE 412	Instrumental Methods <sup>1</sup>	3
CCHE 412L	Instrumentation Lab	1
CCHE 421	Advanced Inorganic Chemistry	3
CCHE 431	Advanced Organic Chemistry	3
CCHE 431L	Advanced Organic Chemistry Lab	1
CCHE 432	Methods of Structure Determin	3
CCHE 432L	Methods of Structural Det Lab	1
CCHE 441	Mathematical Methods in Chemis	3
CCHE 480	Special Topics in Chemistry	4
CCHE 480L	Special Topics in Chem Lab	0

<sup>1</sup> Instrumental Methods is a dual listed course that provides the student with 3 credits of graduate coursework if they continue in the BS/MS Program.

*Students are generally advised to take graduate core courses as part of their free electives during their senior year in an effort to provide more time for research.*

**Graduate Core Courses**

Students must complete 15 credits of graduate courses in the core areas based on their sub-discipline choice.

Code	Title	Hours
<b>Analytical Chemistry</b>		
CCHE 511	Environmental Chemistry	3
<b>Inorganic Chemistry</b>		
CCHE 521	Advanced Inorganic Chemistry	3
<b>Organic Chemistry</b>		
CCHE 531	Mechanistic Organic Chem I	3
CCHE 532	Organic Synthesis	3
<b>Physical Chemistry</b>		
CCHE 541	Thermodynamics	3
CCHE 542	Quantum Mechanics	3
<b>Biochemistry</b>		
CCHE 551	Advanced Biochemistry I	3
CCHE 552	Advanced Biochemistry II	3
<b>Industrial Chemistry</b>		
CCHE 561		3
CCHE 562		3
<b>Polymer Chemistry</b>		
CCHE 571	Intro to Polymer Chemistry	3
CCHE 572	Techniques in Polymer Chem	3
CCHE 572L		0
CCHE 573		3

**Plan of Study for Accelerated Dual Degrees in Bachelor of Science and Master of Science in Chemistry**

(Students who are **not** prepared to complete calculus in their first year of study should arrange a revised plan of study in consultation with an advisor.)

Course	Title	Hours
<b>First Year</b>		
<b>First Semester</b>		
CBIO 111 & 111L	General Biology I & Lab and	4
CENG 105	College Composition I	3
CGED 100	First Year Seminar	1
CMAT 111	Calculus I	4
CCHE 111 & 111L	Gen Chem 1 & Recitation and General Chemistry Lab	4

CCHE 111R		0
<b>Hours</b>		<b>16</b>
<b>Second Semester</b>		
CBIO 112 & 112L	General Biology II & Lab and General Biology II Lab	4
CENG 106	College Composition II	3
CGED 101	1st-Year Seminar	1
CMAT 112	Calculus II	4
CCHE 112 & 112L	Gen Chem II Lec & Recitation and General Chemistry II Lab	4
CCHE 112R		0
<b>Hours</b>		<b>16</b>
<b>Second Year</b>		
<b>First Semester</b>		
CCHE 231 & 231L	Organic Chemistry and Organic Chemistry Lab	4
CCHE 231R	Organic Chemistry Recitation	0
CMAT 211	Calculus III	4
CPHY 121	Physics I: Mechanics	3
CPHY 121L	Physics I: Mechanics Lab	1
Core Elective Humanities (Area A)		3
<b>Hours</b>		<b>15</b>
<b>Second Semester</b>		
CCHE 232 & 232L	Organic Chemistry and Organic Chemistry Lab	4
CCHE 232R	Organic Chemistry Recitation	0
CMAT 212 or CMAT 214	Differential Equations or Linear Algebra	3
CPHY 123	Physics III: Optics/Modern Phys	3
CPHY 123L	Physics III: Optics&Mod.PhyLab	1
CCIS 253 & 253L	Intro. to Comp. Sim/Analysis and Intro. to Comp. Sim/Analy(Lab)	4
CBUS Business Elective		3
<b>Hours</b>		<b>18</b>
<b>Third Year</b>		
<b>First Semester</b>		
CCHE 211 & 211L	Analytical Chemistry I and Analytical Chemistry Lab	4
CCHE 341	Physical Chemistry I	3
CCHE 341L	Physical Chemistry Lab	1
CCHE 341R	Physical Chemistry Recitation	0
CCHE 381	Chemistry Seminar	0
Core Elective Social or Behavioral Science (Area B) <sup>1</sup>		3
Free Elective <sup>2</sup>		3
CCHE 400	Undergraduate Research	0-3
<b>Hours</b>		<b>14-17</b>
<b>Second Semester</b>		
CCHE 342	Physical Chemistry II	3
CCHE 342L	Physical Chemistry Lab	1
CCHE 342R		0
CCHE 382	Chemistry Seminar	1
Free Elective <sup>2</sup>		3
Free Elective		3

CCHE 400	Undergraduate Research	1-3
<b>Hours</b>		<b>12-14</b>
<b>Fourth Year</b>		
<b>First Semester</b>		
CCHE 421 & 421L	Advanced Inorganic Chemistry and	3
CCHE 431	Advanced Organic Chemistry	3
CCHE 431L	Advanced Organic Chemistry Lab	1
CCHE 480	Special Topics in Chemistry	4
CCHE 481	Chemistry Seminar	0
CCHE 400	Undergraduate Research	1-3
Free Elective <sup>2</sup>		3
<b>Hours</b>		<b>15-17</b>
<b>Second Semester</b>		
CCHE 412 & 412L	Instrumental Methods and Instrumentation Lab	4
CCHE 432	Methods of Structure Determin	3
CCHE 432L	Methods of Structural Det Lab	1
CCHE 482	Chemistry Seminar	1
CCHE 400	Undergraduate Research	1-3
Free Elective <sup>2</sup>		3
Free Elective <sup>2</sup>		3
<b>Hours</b>		<b>16-18</b>
<b>Third Semester</b>		
CCHE XXX	Graduate Research in Chemistry	6
<b>Hours</b>		<b>6</b>
<b>Fifth Year</b>		
<b>First Semester</b>		
CCHE XXX	Graduate Core Course/CCHE Area Course	3
CCHE XXX	Graduate Core Course/CCHE Area Course	3
CCHE XXX	Graduate Core Course	3
CCHE XXX	Graduate Research in Chemistry	3
<b>Hours</b>		<b>12</b>
<b>Second Semester</b>		
CCHE XXX	Graduate Core Course/CCHE Area Course	3
CCHE XXX	Graduate Core Course	3
CCHE XXX	Graduate Research in Chemistry	6
<b>Hours</b>		<b>12</b>
<b>Total Hours</b>		<b>152-161</b>

<sup>1</sup> Courses are selected based on consultation with an advisor and in alignment with the students' interests.

<sup>2</sup> Free electives should be chosen in consultation with the advisor depending on the choice of minor or stackable credentials.