Chemistry

Department Information

- **Department Location:**
  Ladd Hall
- **Department Phone:**
  701-231-8694
- **Department Email:**
  ndsu.chemistry@ndsu.edu
- **Department Web Site:**
  www.ndsu.edu/chemistry/ (http://www.ndsu.edu/chemistry/)
- **Credential Offered:**
  B.S.; B.A.
- **Plan Of Study Sample:**
  catalog.ndsu.edu/programs-study/undergraduate/chemistry/#planofstudytext (http://catalog.ndsu.edu/programs-study/undergraduate/chemistry/#planofstudytext)

Major Requirements

Major: Chemistry

Degree Type: B.A. or B.S.
Minimum Degree Credits to Graduate: 122

University Degree Requirements

1. Satisfactory completion of all requirements of the curriculum in which one is enrolled.
2. Earn a minimum total of 120 credits in approved coursework. Some academic programs exceed this minimum.
3. Satisfactory completion of the general education requirements as specified by the university.
4. A minimum institutional GPA of 2.00 based on work taken at NDSU.
5. At least 36 credits presented for graduation must be in courses numbered 300 or higher.
6. Transfer Students: Must earn a minimum of 60 credits from a baccalaureate-degree granting or professional institution.
   a. Of these 60, at least 36 must be NDSU resident credits as defined in #7.
   b. Within the 36 resident credits, a minimum of 15 must be in courses numbered 300 or higher and 15 credits in the major field of study.
7. At least 36 credits must be NDSU resident credits. Resident credits include credits registered and paid for at NDSU.

For complete information, please refer to the Degree and Graduation Requirements (http://catalog.ndsu.edu/past-bulletin-archive/2021-22/academic-policies/undergraduate-policies/degree-and-graduation/) section of this Bulletin.

University General Education Requirements

Code	Title	Credits
Communication (C)		**12**
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
Upper Division Writing †		
Quantitative Reasoning (R) †		**3**
Science and Technology (S) †		**10**
Humanities and Fine Arts (A) †		**6**
Social and Behavioral Sciences (B) †		**6**
Wellness (W) †		**2**
Cultural Diversity (D) *†		
Global Perspectives (G) *†		
Total Credits		**39**

* May be satisfied by completing courses in another General Education category.

† General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review major requirements to determine if specific courses can also satisfy these general education categories.

- A list of university approved general education courses and administrative policies are available here (http://catalog.ndsu.edu/past-bulletin-archive/2021-22/academic-policies/undergraduate-policies/general-education/#genedcoursestext).

College Requirements

Code	Title	Credits
Bachelor of Arts (BA) Degree – An additional 12 credits Humanities and Social Sciences and proficiency at the second year level in a modern foreign language. *		**12**
Bachelor of Science (BS) Degree – An additional 6 credits in Humanities or Social Sciences *		**6**

* Humanities and Social Sciences may be fulfilled by any course having the following prefix: ADHM, ANTH, ARCH, ART, CJ, CLAS, COMM, ECON, ENGL, FREN, GEOG, GERM, HDFS, HIST, LA, LANG, MUSC, PHIL, POLS, PSYC, RELS, SOC, SPAN, THEA, WGS, or any course from the approved list of general education courses in humanities and social sciences (general education categories A and B). These credits must come from outside the department of the student's major.

Major Requirements

Except for courses offered only as pass/fail grading, no course may be taken Pass/Fail.

Code	Title	Credits
Chemistry Core Requirements		
Select one from the following (May satisfy general education category S):		4
CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory	
CHEM 150 & CHEM 160	Principles of Chemistry I and Principles of Chemistry Laboratory I	
Select one from the following (May satisfy general education category S):		4
CHEM 122 & 122L	General Chemistry II and General Chemistry II Laboratory	
CHEM 151 & CHEM 161	Principles of Chemistry II and Principles of Chemistry Laboratory II	
CHEM 341	Organic Chemistry I	3
CHEM 342	Organic Chemistry II	3
CHEM 353	Majors Organic Chemistry Laboratory I	1
CHEM 354	Majors Organic Chemistry Laboratory II	2
CHEM 364	Physical Chemistry I	3
CHEM 365	Physical Chemistry II	3
CHEM 380	Chemistry Junior Seminar	1
CHEM 431 & 431L	Analytical Chemistry I and Analytical Chemistry I Laboratory	5
CHEM 471	Physical Chemistry Laboratory (Not required for Pre-professional and Chemistry Education Options)	2
BIOC 460	Foundations of Biochemistry and Molecular Biology I	3
BIOC 460L	Foundations of Biochemistry I Laboratory	1
CHEM 491	Seminar	2
Related Required Courses		
ENGL 321	Writing in the Technical Professions (May satisfy general education category C)	3
or ENGL 324	Writing in the Sciences	
MATH 128	Introduction to Linear Algebra	1
MATH 165	Calculus I (May satisfy general education category R)	4
MATH 166	Calculus II	4
MATH 259	Multivariate Calculus	3
PHYS 251 & 251L	University Physics I and University Physics I Laboratory (May satisfy general education category S)	5

PHYS 252 & 252L	University Physics II and University Physics II Laboratory	5
Option	**Select one of the five options listed below to complete the major.**	**12-32**
Total Credits		**74-94**

Select one of the five options to complete major requirements (12-32 credits):

Option 1: ACS Certified Chemistry

Code	Title	Credits
CHEM 425 & CHEM 429	Inorganic Chemistry I and Inorganic Chemistry Laboratory	5
CHEM 432 & 432L	Analytical Chemistry II and Analytical Chemistry II Laboratory	4
MATH 266	Introduction to Differential Equations	3
Total Credits		**12**

Option 2: ACS Certified w/Biochemistry Option

Code	Title	Credits
BIOC 461	Foundations of Biochemistry and Molecular Biology II	3
BIOC 473	Methods of Biochemical Research	3
BIOC 474	Methods of Recombinant DNA Technology	3
BIOL 150 & 150L	General Biology I and General Biology I Laboratory	4
CHEM 425 & CHEM 429	Inorganic Chemistry I and Inorganic Chemistry Laboratory	5
MATH 266	Introduction to Differential Equations	3
MICR 350 & 350L	General Microbiology and General Microbiology Lab	5
Select 6 credits of the following (Biology):		6
BIOL 315 & 315L	Genetics and Genetics Laboratory	
BOT 380	Plant Physiology	
MICR 352	General Microbiology II	
ZOO 370	Cell Biology	
Total Credits		**32**

Option 3: Coating & Polymeric Materials

Code	Title	Credits
CHEM 425 & CHEM 429	Inorganic Chemistry I and Inorganic Chemistry Laboratory	5
CHEM 471	Physical Chemistry Laboratory	2
CHEM 432 & 432L	Analytical Chemistry II and Analytical Chemistry II Laboratory	4
CPM 473	Polymer Synthesis	3
CPM 474 & CPM 484	Applied Polymer Science and Coatings I Laboratory	5
CPM 475 & CPM 485	Coatings' Materials Science and Coatings II Laboratory	5
MATH 266	Introduction to Differential Equations	3
Total Credits		**27**

Option 4: Pre-Professional Option

Code	Title	Credits
BIOL 150 & 150L	General Biology I and General Biology I Laboratory	4

BIOL 220 & 220L	Human Anatomy and Physiology I and Human Anatomy and Physiology I Laboratory	4
BIOL 221 & 221L	Human Anatomy and Physiology II and Human Anatomy and Physiology II Laboratory	4
CHEM 425	Inorganic Chemistry I	3
MATH 266	Introduction to Differential Equations	3
or STAT 330	Introductory Statistics	
MICR 350 & 350L	General Microbiology and General Microbiology Lab	5
Total Credits		**23**

Option 5: Chemistry Pre-Education Application must be made to the School of Education in order to obtain a teaching degre

Code	Title	Credits
BIOL 150 & 150L	General Biology I and General Biology I Laboratory	4
CHEM 425	Inorganic Chemistry I	3
EDUC 321	Introduction to Teaching	3
EDUC 322	Educational Psychology	3
MATH 266	Introduction to Differential Equations	3
or STAT 330	Introductory Statistics	
PHYS Elective		3
Recommended for Education Option		
BIOL 151 & 151L	General Biology II and General Biology II Laboratory	4
GEOL 105 & 105L	Physical Geology and Physical Geology Lab	4
Total Credits		**27**