

## Combined/Accelerated M.S. Degree in Chemistry

The Department of Chemistry and Biochemistry offers a combined/accelerated B.S.+M.S. degree in Chemistry. Scholarships are available from the department for highly qualified students during the undergraduate part of the program. All incoming chemistry undergraduate majors are considered for these awards. The coursework for the M.S. degree can be completed in five years. Students with curricular questions are strongly encouraged to consult their research advisor, the department's Director of Undergraduate Studies, or the Graduate Student Progress Committee (GSPC) Chair for questions about the curriculum.

Students should take special note of the following prerequisite issues:

- 1) Course offerings: In general, most Chem and Bioc courses are offered once per year, in either Fall or Spring as shown on the curriculum sheets. Some exceptions: Chem 121, 122, and 341 are offered Fall, Spring, and Summer; Chem 342 is offered Spring and Summer; some of the 700-level graduate elective courses are offered every other year.
- 2) Candidates for the MS degree are required to have completed at least 60 credits prior to conditional admission to the Accelerated M.S. program and the [College of Graduate and Interdisciplinary Studies](https://www.ndsu.edu/fileadmin/facultysenate/acadaffairs/accelerated-programs.pdf).
- 3) Candidates for the MS degree must have a cumulative GPA of 3.5 to be eligible for conditional graduate admission to the combined/accelerated program.
- 4) Candidates interested in and eligible for the MS degree must, at the end of their sophomore coursework (typically their fourth semester in the program):
  - (a) select a M.S. research advisor and must
  - (b) complete and submit a Combined/Accelerated Program Degree Program Declaration form (<https://www.ndsu.edu/fileadmin/facultysenate/acadaffairs/accelerated-programs.pdf>) to the Department Undergraduate program Chair. The Chair will evaluate student eligibility and approve the substitution of the graduate 600-level courses into the undergraduate program as noted in the curriculum below.
  - (c) After receiving the necessary approvals noted above, the student will submit this form to the Graduate College and formally apply for admission to the graduate program.
- 5) A maximum of 15 graduate student credits may be applied to the B.S. degree.
- 6) Graduate courses will not be considered for Dean's List or Undergraduate Graduation with Honor calculations. Enrollment verifications will be conducted at the dual-career/combined level.
- 7) Graduate tuition will be assessed for graduate credits approved for double-counting toward requirements for both undergraduate and graduate programs of study. Double-counted graduate credits count toward totals for financial aid, but are not covered under the tuition cap. Mandatory Student fees, however, are capped at 12 credits, regardless of program.
- 8) If funding permits, and at the discretion of the research advisor, students may be supported as research assistants, thereby qualifying for a tuition waiver on graduate tuition in the last year of the accelerated curriculum.
- 9) In order for Student Financial Services to review financial aid eligibility, the Graduate courses counting towards the Undergraduate Plan of Study must be detailed in the Combined/Accelerated Degree Program Declaration Form. Substitution forms to fulfill undergraduate requirements will be submitted by the department to the Office of Registration and Records.
- 10) Students must complete all baccalaureate degree requirements at least one semester prior to the term in which the graduate degree is to be conferred.
- 11) Before receipt of baccalaureate degree, the graduate courses/credits included on the Combined/Accelerated Degree Program Declaration Form (up to 15 credits) will be internally transferred to the undergraduate career for inclusion in undergraduate degree/record totals. They will not be detailed on the undergraduate record, but rather, will appear as NDSU transfer credit. A transcript note will be applied after the transfer cumulative strip that reads, 'Coursework displayed on the graduate record and applied to undergraduate degree requirements as part of an approved accelerated/combined plan of study.'
- 12) All admissions to the Graduate College are conditional. The minimum condition is completion of the bachelor's degree prior to full standing in master's program, and maintaining a 3.0 cumulative GPA in their graduate classes. Other conditions related to academic performance such as research evaluations, may be added.
- 13) No undergraduate course may be counted toward a master's degree.
- 14) Students must meet all of the requirements that would ordinarily be expected of those enrolled in the master's program.
- 15) Students will, in consultation with their research advisor, select a M.S. advisory committee, prior to starting the last year (typically the fifth year) of the accelerated program. This committee will comprise of at least 3 faculty members, including the primary research advisor, another faculty from the

department, and a faculty member external to the department. This committee will evaluate and approve the graduate plan of study.

- 16) The graduate plan of study must include at least 30 graduate-level credits which can include credits for MS thesis research and defense seminar.
  - (a) For the Thesis Option: no fewer than 19 of these credits shall be didactic graduate courses (courses numbered 601 to 789), including a minimum of 10 credits from courses numbered 701 to 789. Of these 10 credits, Chem 720 and Univ 720 are required courses for the M.S. degree. The remaining didactic credits may be selected at the discretion of the student and their research advisor. The number of research credits (Chem 798) applied to the MS degree must equal at least 6, but cannot exceed 10 credits.
  - (b) For the Non-thesis Option: no fewer than 29 of these credits shall be didactic graduate courses (courses numbered 601 to 789), including a minimum of 21 credits from courses numbered 701 to 789. Of these 21 credits, Chem 720 and Univ 720 are required courses for the M.S. degree. The remaining didactic credits need to include a minimum of 12 credits from the four core courses for chemistry graduate programs (Chem 725, 732, 741 and 759).
  - (c) Both Thesis and Non-thesis Options must include one credit from the Graduate Seminar (Chem 790). For the Thesis Option, another credit is required from Chem 790 for the MS thesis defense.

**Accelerated M.S. Degree in Chemistry (Thesis Option)**  
**Recommended Course Schedule**

<b>B.S. in Chemistry (ACS Certified Option)</b>		<b>Credits</b>	
<b>First Year</b>		<b>F</b>	<b>S</b>
CHEM 150, 151	Principles of Chemistry I, II	3	3
(or CHEM 121, 122)	(General Chemistry I, II)	(3)	(3)
CHEM 160, 161	Principles of Chemistry Lab I, II	1	1
(or CHEM 121L, 122L)	(General Chemistry Lab I, II)	(1)	(1)
ENGL 110, 120	College Composition I, II	3	3
MATH 165, 166	Calculus I, II	4	4
MATH 128	Introduction to Linear Algebra	1	
COMM 110	Fundamentals of Public Speaking		3
Gen. Ed., Electives <sup>1</sup>	Wellness and General Education electives	3	
		<b>15</b>	<b>14</b>
<b>Second Year</b>			
CHEM 341, 342	Organic Chemistry I, II	3	3
CHEM 353, 354	Majors Organic Chemistry Lab I, II	1	2
PHYS 251, 252	University Physics I, II	4	4
PHYS 251L, 252L	University Physics Lab I, II	1	1
MATH 259 <sup>2</sup>	Multivariate Calculus	3	
MATH 266	Introduction to Differential Equations		3
Gen. Ed., Electives <sup>1</sup>	General Education & other electives	3	3
		<b>15</b>	<b>16</b>
<b>Third Year</b>			
CHEM 364, 365	Physical Chemistry I, II	3	3
CHEM 471	Physical Chemistry Lab		2
CHEM 431, 432	Analytical Chemistry I, II	3	3
CHEM 431L, 432L	Analytical Chemistry Lab I, II	2	1
BIOC 460	Foundations of Biochem. & Mol. Bio. I	3	
BIOC 460L	Found. of Biochem. & Mol. Bio. Lab I	1	
CHEM 380	Chemistry Junior Seminar		1
ENGL 321	Writing in the Technical Professions		3
(or ENGL 324)	(Writing in the Sciences)		(3)
Gen. Ed., Electives <sup>1</sup>	General Education & other electives	3	
CHEM 493	Undergraduate Research		1
		<b>15</b>	<b>14</b>
<b>Fourth Year</b>			
CHEM 425	Inorganic Chemistry I	3	
CHEM 429	Inorganic Chemistry Lab		2
600-689 Electives <sup>3</sup>	Graduate chem/biochem electives	3	3
CHEM 491	Chemistry Senior Seminar		2
CHEM 493	Undergraduate Research	1	1
Gen. Ed., Electives <sup>1</sup>	General Education & other electives	5	3
		<b>12</b>	<b>11</b>
<b>Fifth Year</b>			
Chem 720	Introduction to Chemical Research	2	
Univ 720	Scientific Integrity	1	
CHEM 790	Graduate Seminar (Chemical Literature)	1	
700-789 Electives <sup>4</sup>	Graduate electives	4	6
CHEM 798	MS Thesis Research	3-5	3-5
CHEM 790	Graduate Seminar (MS Thesis Defense)		1
		<b>11-13</b>	<b>10-12</b>
<b>Curriculum Total</b>		<b>137</b>	

<sup>1</sup> Elective courses for University & College General Education requirements: must include 18 credits in humanities and social sciences and 2 credits in wellness. In addition, 3 of these credits must be in Global Perspective (G) and 3 in Cultural Diversity (D) category.

<sup>2</sup> MATH 265 (Calculus III, 4 credits) may be substituted for MATH 259; substitution form needed.

<sup>3</sup> Graduate chemistry/biochemistry electives: 6 credits of courses numbered 600-689 in BIOC or CHEM.

<sup>4</sup> Graduate chemistry/biochemistry electives: 10 credits of courses numbered 700-789, 791 or 800-889, 891 in BIOC or CHEM.

**Accelerated M.S. Degree in Chemistry (Non-Thesis Option)**  
**Recommended Course Schedule**

<b>B.S. in Chemistry (ACS Certified Option)</b>		<b>Credits</b>	
<b>First Year</b>		<b>F</b>	<b>S</b>
CHEM 150, 151 (or CHEM 121, 122)	Principles of Chemistry I, II (General Chemistry I, II)	3 (3)	3 (3)
CHEM 160, 161 (or CHEM 121L, 122L)	Principles of Chemistry Lab I, II (General Chemistry Lab I, II)	1 (1)	1 (1)
ENGL 110, 120	College Composition I, II	3	3
MATH 165, 166	Calculus I, II	4	4
MATH 128	Introduction to Linear Algebra	1	
COMM 110	Fundamentals of Public Speaking		3
Gen. Ed., Electives <sup>1</sup>	Wellness and General Education electives	3	
		<b>15</b>	<b>14</b>
<b>Second Year</b>			
CHEM 341, 342	Organic Chemistry I, II	3	3
CHEM 353, 354	Majors Organic Chemistry Lab I, II	1	2
PHYS 251, 252	University Physics I, II	4	4
PHYS 251L, 252L	University Physics Lab I, II	1	1
MATH 259 <sup>2</sup>	Multivariate Calculus	3	
MATH 266	Introduction to Differential Equations		3
Gen. Ed., Electives <sup>1</sup>	General Education & other electives	3	3
		<b>15</b>	<b>16</b>
<b>Third Year</b>			
CHEM 364, 365	Physical Chemistry I, II	3	3
CHEM 471	Physical Chemistry Lab		2
CHEM 431, 432	Analytical Chemistry I, II	3	3
CHEM 431L, 432L	Analytical Chemistry Lab I, II	2	1
BIOC 460	Foundations of Biochem. & Mol. Bio. I	3	
BIOC 460L	Found. of Biochem. & Mol. Bio. Lab I	1	
CHEM 380	Chemistry Junior Seminar		1
ENGL 321 (or ENGL 324)	Writing in the Technical Professions (Writing in the Sciences)		3 (3)
Gen. Ed., Electives <sup>1</sup>	General Education & other electives	3	
		<b>15</b>	<b>13</b>
<b>Fourth Year</b>			
CHEM 425	Inorganic Chemistry I	3	
CHEM 429	Inorganic Chemistry Lab		2
600-689 Electives <sup>3</sup>	Graduate chem/biochem electives	3	5
CHEM 491	Chemistry Senior Seminar		2
Gen. Ed., Electives <sup>1</sup>	General Education & other electives	7	3
		<b>13</b>	<b>12</b>
<b>Fifth Year</b>			
Chem 720	Introduction to Chemical Research	2	
Univ 720	Scientific Integrity	1	
CHEM 790	Graduate Seminar (Chemical Literature)	1	
700-789 Electives <sup>4</sup>	Graduate electives	8	10
		<b>12</b>	<b>10</b>
<b>Curriculum Total</b>		<b>135</b>	

<sup>1</sup> Elective courses for University & College General Education requirements: must include 18 credits in humanities and social sciences and 2 credits in wellness. In addition, 3 of these credits must be in Global Perspective (G) and 3 in Cultural Diversity (D) category.

<sup>2</sup> MATH 265 (Calculus III, 4 credits) may be substituted for MATH 259; substitution form needed.

<sup>3</sup> Graduate chemistry/biochemistry electives: 8 credits of courses numbered 600-689 in BIOC or CHEM.

<sup>4</sup> Graduate science electives: a minimum of 18 credits of courses numbered 700-789, 791 or 800-889, 891 in BIOL, BIOC, BOT, ZOO, CHEM, CSCI, MICR, PSCL, PHYS, PPTH, or STAT. In addition, 12 of these credits must be from following core courses for chemistry graduate programs:

<b>CHEM 725</b>	Advanced Survey of Inorganic Chemistry	<b>4 credits</b>
<b>CHEM 732</b>	Advanced Survey of Analytical Chemistry	<b>4 credits</b>

<b>CHEM 741</b>	Advanced Survey of Organic Chemistry	<b>4 credits</b>
<b>CHEM 759</b>	Advanced Survey of Physical Chemistry	<b>4 credits</b>