

UNIVERSITY OF NORTH★TEXAS™

DEPARTMENT OF BIOLOGICAL SCIENCES

BIOCHEMISTRY DEGREE PROGRAMS

Bachelor of Arts with a major in Biochemistry
Bachelor of Science in Biochemistry
Catalog Year 2005-2006

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Admission to the Biochemistry Major

Entering students interested in majoring in biochemistry will be classified as pre-majors and will be advised by the department. Admission to the university does not guarantee admission to the major. To be admitted to the major (and be eligible to enroll in advanced biology and biochemistry courses), a pre-major must meet all the requirements* listed below:

Pre-major Biology and Biochemistry Course Requirements (must complete each with a grade of C or better)		
BIOL 1710/1730	4 hrs.	Principles of Biology I with Laboratory
BIOL 1720/1740 or BIOL 2040	4 hrs.	Principles of Biology II with Laboratory or Biology of Microorganisms (lecture and laboratory)
BIOC 2000	2 hrs.	Vistas in Biochemistry
Pre-major Chemistry Course Requirements (must complete each with a grade of C or better)		
CHEM 1410/1430	4 hrs.	General Chemistry I with Laboratory
CHEM 1420/1440	4 hrs.	General Chemistry II with Laboratory
CHEM 2370/3210	4 hrs.	Organic Chemistry I with Laboratory
Pre-major Mathematics Course Requirement (May be satisfied by placement)		
MATH 1650	5 hrs.	Pre-calculus (or equivalent as determined by Dept. of Mathematics)
Other Pre-major Requirements		
Have at least a 2.5 GPA on the required biology, biochemistry, chemistry, and mathematics courses listed above; Have a minimum 2.0 UNT grade point average.		

*See the UNT Undergraduate Catalog to determine prerequisites required for each course.

Bachelor of Arts with a major in Biochemistry

The chemistry and biochemistry courses required for a Bachelor of Arts with a major in Biochemistry (BA-Biochemistry) are listed in the table below. These courses are in addition to those required in the pre-major. Other courses required in the degree are listed in the "Other Requirements" table on the next page.

Additional Required Chemistry and Biochemistry courses for the BA-Biochemistry*		
CHEM 2380/3220	4 hrs.	Organic Chemistry II with Laboratory
CHEM 3451/3452	4 hrs.	Quantitative Analysis with Laboratory
CHEM 3530	4 hrs.	Physical Chemistry for the Life Sciences
BIOC 3621/3622**	4 hrs.	Elementary Biochemistry with Laboratory
BIOC 4570/4580	5 hrs.	Biochemistry and Molecular Biology of the Gene with Laboratory
Total Hours in Major:	35 hrs.	
Advanced Hours in Major:	19 hrs.	

*See the UNT Undergraduate Catalog to determine prerequisites required for each course.

**Pre-medical/Pre-dental students should substitute BIOC 4540/4550/4560 for BIOC 3621/3622

Bachelor of Science in Biochemistry

The chemistry and biochemistry courses required for a Bachelor of Science in Biochemistry (BS-Biochemistry) are listed in the following table. These courses are in addition to those required in the pre-major. Other courses required in the degree are listed in the "Other Requirements" table on the next page.

Additional Required Biology courses for the BS-Biochemistry*		
CHEM 2380/3220	4 hrs.	Organic Chemistry II with Laboratory
CHEM 3451/3452	4 hrs.	Quantitative Analysis with Laboratory
CHEM 3510	3 hrs.	Physical Chemistry I
CHEM 3520	3 hrs.	Physical Chemistry II
BIOC 4540	3 hrs.	Biochemistry I
BIOC 4550	3 hrs.	Biochemistry II
BIOC 4560	2 hrs.	Biochemistry Laboratory
BIOC 4570/4580	5 hrs.	Biochemistry and Molecular Biology of the Gene with Laboratory
Total Hours in Major:	41 hrs.	
Advanced Hours in Major:	25 hrs.	

*See the UNT Undergraduate Catalog to determine prerequisites required for each course.

Other Requirements: BA-Biochemistry and BS-Biochemistry

The courses* and requirements listed below are applied to both the BA-Biochemistry and the BS-Biochemistry degree programs. These requirements are in addition to those listed for the pre-major:

Biology courses to complete Biology Minor (the minor includes the biology courses used in the pre-major)		
BIOL 3510/3520	4 hrs.	Cell Biology with Laboratory
Advanced Biology Elective with Laboratory (BIOL 3451/3452 required in BS-Biochemistry)	4 hrs.	Select from advanced biology courses that count in the Biology major. (Genetics with Laboratory required in BS-Biochemistry)
Advanced Biology Elective with Laboratory	4 hrs.	Select from advanced biology courses that count in the Biology major.
Physics Courses**		
PHYS 1510/1530	4 hrs.	General Physics I with Calculus, with Laboratory
PHYS 1520/1540	4 hrs.	General Physics II with Calculus, with Laboratory
Mathematics Course Requirement		
MATH 1710	4 hrs.	Calculus I
MATH 1720 (BS-Biochemistry only)	3 hrs.	Calculus II
Technical Writing Requirement		
ENGL 2700	3 hrs.	Technical Writing
Other Major Requirements		
A minimum 2.5 grade point average must be maintained on all advanced science courses.		

*See the UNT Undergraduate Catalog to determine prerequisites required for each course.

** May substitute PHYS 1710/1730 and 2220/2240.

B.A. Biochemistry Degree Program

Suggested Arrangement of Courses Distributed Over Four Years

BA, major in Biochemistry

FRESHMAN YEAR

FALL	HOURS	SPRING	HOURS
BIOC 2000 Vistas in Biochemistry	1	BIOL 2040 Biology of Microorganisms; OR	4
BIOL 1710 Principles of Biology I OR	3	BIOL 1720 Principles of Biology II OR	
BIOL 1711 Principles of Biology I ²		BIOL 1722 Honors Principles of Biology II AND	
BIOL 1730 Principles of Biology I Laboratory	1	BIOL 1740 Principles of Biology II Laboratory ²	
CHEM 1410 General Chemistry I OR	3	CHEM 1420 General Chemistry II OR	3
CHEM 1413 Honors General Chemistry I ¹		CHEM 1423 Honors General Chemistry II ¹	
CHEM 1430 General Chemistry I Laboratory	1	CHEM 1440 General Chemistry II Laboratory	1
ENGL 1310 College Writing I	3	ENGL 2700 Technical Writing	3
MATH 1650 Pre-Calculus ³	<u>5</u>	MATH 1710 Calculus I ³	<u>4</u>
TOTAL	17	TOTAL	15

SOPHOMORE YEAR

FALL	HOURS	SPRING	HOURS
BIOC 2000 Vistas in Biochemistry	1	CHEM 2380 Organic Chemistry II	3
CHEM 2370 Organic Chemistry I	3	CHEM 3220 Organic Chemistry II Laboratory	1
CHEM 3210 Organic Chemistry I Laboratory	1	LANG 2050 Foreign Language (Intermediate) ⁷	3
LANG 2040 Foreign Language (Intermediate) ⁷	3	PHYS 1520 General Physics II w/ Calculus	3
PHYS 1510 General Physics I w/ Calculus	3	PHYS 1540 General Physics II w/ Calculus Laboratory	1
PHYS 1530 General Physics I w/ Calculus Laboratory	1	PSCI 1050 American Government II	3
PSCI 1040 American Government I	<u>3</u>	Wellness	<u>3</u>
TOTAL	15	TOTAL	17

JUNIOR YEAR

FALL	HOURS	SPRING	HOURS
BIOL 3510/3520 Cell Biology w/ Laboratory	4	BIOC 4570 Biochemistry & Molecular Biology of the Gene	3
CHEM 3451/3452 Quantitative Analysis w/ Laboratory	4	BIOC 4580 Molecular Biology and Biotechnology	2
HIST 2610 United States History to 1865 ⁶	3	Laboratory	
Communication ⁴	3	HIST 2620 United States History since 1865 ⁶	3
Social and Behavioral Sciences ⁴	<u>3</u>	BIOL (Advanced)	4
TOTAL	17	Visual and Performing Arts ⁴	<u>3</u>
		TOTAL	15

SENIOR YEAR

FALL	HOURS	SPRING	HOURS
BIOC 3621/3622 Elementary Biochemistry	4	CHEM 3530 Physical Chemistry for Life Science	4
w/ Laboratory		Elective (Advanced)	3
BIOL (Advanced)	4	Elective (Advanced)	3
Cross-cultural, Diversity and Global Studies ^{4,8}	3	Elective (Advanced)	2
Elective (Advanced)	3	Humanities	<u>3</u>
Literature ^{4,8}	<u>3</u>	TOTAL	15
TOTAL	17		

Minimum Total Hours for Degree: 128 ¹⁰

*1-10 footnotes are on following page

Actual degree plans may vary depending on availability of courses in a given semester. Some courses may require prerequisites not listed.

¹CHEM 1413 and 1423 are honors classes. These courses are recommended for freshmen who took honors chemistry in high school. Students who elect for honors chemistry enroll in regular CHEM 1430/1440 laboratory sections.

²8 hours of lower division BIOL classes can be used to complete 20 hour biology minor. BIOL 1710/1730 and 1720/1740 are recommended.

³Students should consult the Department of Mathematics for proper placement to the appropriate level before beginning their mathematics program.

⁴Humanities, Literature, Oral/Advanced Written Communications, Social and Behavioral Sciences, Visual and Performing Arts, Cross Cultural, Diversity, & Global Studies: One course per group. See University Core Section of this catalog for a list of approved courses. Completing upper division classes will help make the 42 advanced hours requirement.

⁵Biochemistry 4540/4550/4560 may be substituted for BIOC 3621/3622 and this substitution is strongly recommended for preprofessional students and students intending to go on to graduate school in biochemistry.

⁶Advanced U.S./Texas History courses may substitute to help meet 42 advanced hours degree requirement.

⁷Contact the Foreign Language Department for proper placement into appropriate level. Must either be proficient through freshman level or complete LANG 1010 and 1020 before starting LANG 2040 and 2050.

⁸Completing ENGL 3450, ENGL 3920 or ENGL 4300 simultaneously fulfills the Arts and Sciences Literature requirement.

⁹Upper division hours may be required here to meet 42 advanced hours degree requirement

Summary of Degree Requirements

Biochemistry/Chemistry (19 advanced hours)	35
Biology Minor (12 advanced hours)	20
Physics	8
Math	4
Core Curriculum	
English	6
History	6
American Government	6
Social and Behavioral Sciences	3
Cross Cultural, Diversity and Global Studies	3
Humanities	3
Literature	3
Visual and Performing Arts	3
Foreign Language	3-14
Electives (may require upper division)	6-11
Advanced Oral/Written Communications	<u>3</u>
Minimum Hours	128

Note: 42 hours must be advanced.: 24 advanced hours must be taken UNT.

24 of last 30 hours must be completed at UNT

2.5 GPA required in all advanced courses attempted in the Division of Science.

Bachelor of Science in Biochemistry

Suggested Arrangement of Courses Distributed Over Four Years

BS in Biochemistry

FRESHMAN YEAR

FALL	HOURS	SPRING	HOURS
BIOC 2000 Vistas in Biochemistry	1	BIOL 2040 Biology of Microorganisms; OR	4
BIOL 1710 Principles of Biology I OR BIOL 1711 Principles of Biology I ²	3	BIOL 1720 Principles of Biology II OR BIOL 1722 Honors Principles of Biology II AND BIOL 1740 Principles of Biology II Laboratory ²	
BIOL 1730 Principles of Biology I Laboratory	1	CHEM 1420 General Chemistry II OR	3
CHEM 1410 General Chemistry I OR CHEM 1413 Honors General Chemistry I ¹	3	CHEM 1423 Honors General Chemistry II ¹	
CHEM 1430 General Chemistry I Laboratory	1	CHEM 1440 General Chemistry II Laboratory	1
ENGL 1310 College Writing I	3	ENGL 2700 Technical Writing	3
MATH 1710 Calculus I ³	4	MATH 1720 Calculus II ³	3
TOTAL	16	TOTAL	15

SOPHOMORE YEAR

FALL	HOURS	SPRING	HOURS
BIOC 2000 Vistas in Biochemistry	1	BIOL3451/3452 Genetics w/ Laboratory	4
CHEM 2370 Organic Chemistry I	3	CHEM 2380 Organic Chemistry II	3
CHEM 3210 Organic Chemistry I Laboratory	1	CHEM 3220 Organic Chemistry II Laboratory	1
LANG 2040 Foreign Language (Intermediate) ⁷	3	LANG 2050 Foreign Language (Intermediate) ⁷	3
PHYS 1510 General Physics I w/ Calculus OR PHYS 1710 Mechanics	3	PHYS 1520 General Physics II w/ Calculus OR PHYS 2220 Electricity & Magnetism	3
PHYS 1530 General Physics I w/ Calculus Laboratory 1730 Laboratory in Mechanics	1	PHYS 1540 General Physics II w/ Calculus Laboratory OR PHYS 2240 Laboratory in Wave Motion, Electricity, Magnetism and Optics	1
PSCI 1040 American Government I Communications	3	PSCI 1050 American Government II	3
TOTAL	18	TOTAL	18

JUNIOR YEAR

FALL	HOURS	SPRING	HOURS
CHEM 3510 Physical Chemistry I	3	CHEM 3520 Physical Chemistry II	3
BIOL (Advanced)	4	BIOC 4570 Biochemistry & Molecular Biology of the Gene	3
BIOL 3510/3520 Cell Biology w/ Laboratory	4	BIOC 4580 Molecular Biology and Biotechnology Laboratory	2
CHEM 3451/3452 Quantitative Analysis w/ Laboratory	4	HIST 2620 United States History since 1865 ⁶	3
HIST 2610 United States History to 1865 ⁶	3	Visual and Performing Arts ⁴	3
TOTAL	18	Wellness ⁴	3
		TOTAL	17

SENIOR YEAR

FALL	HOURS	SPRING	HOURS
BIOC 4540 Biochemistry I	3	BIOC 4550 Biochemistry II	3
BIOC 4560 Biochemistry I Laboratory	2	Elective ⁹	3
Humanities ⁴	3	Elective ⁹	3
Cross-cultural, Diversity and Global Studies ^{4,8}	3	Elective (Advanced)	2
Elective ⁹	3	Social and Behavioral Sciences ⁴	3
Literature ^{4,8}	3	Division of Science Course (Advanced) ¹⁰	3
TOTAL	17	TOTAL	17

Minimum total hours for Degree: 135

*1-10 footnotes are on following page.

Actual Degree plans may vary depending on availability of courses in a given semester. Some courses may require prerequisites not listed.

¹CHEM 1413 and 1423 are honors classes. These courses are recommended for freshmen who took honors chemistry in high school. Students who elect for honors chemistry enroll in regular CHEM 1430/1440 laboratory sections.

² 8 hours of lower division BIOL classes can be used to complete the 20 hour biology minor. BIOL 1710/1730 and 1720/1740 are recommended.

³Students should consult the Department of Mathematics for proper placement to the appropriate level before beginning their mathematics program.

⁴Humanities, Literature, Oral/Advanced Written Communications, Social and Behavioral Sciences, Visual and Performing Arts, Cross Cultural, Diversity, & Global Studies, and Wellness: One course per group. See University Core Section of this catalog for a list of approved courses. Completing upper division classes will help make the 42 advanced hours requirement.

⁵May be necessary to meet the 84 hours in the Division of Science requirement.

⁶Advanced U.S./Texas History courses may substitute to help meet 42 advanced hours degree requirement.

⁷Contact the Foreign Language Department for proper placement into appropriate level. Must either be proficient through freshman level or complete LANG 1010 and 1020 before starting LANG 2040 and 2050.

⁸Completing ENGL 3450, ENGL 3920 or ENGL 4300 simultaneously fulfills the Arts and Sciences Literature requirement.

⁹Upper division hours may be required here to meet 42 advanced hours degree requirement

¹⁰Required to meet the 40 advanced hours in science requirement. Option should be selected with the assistance of undergraduate advisor.

Summary of Degree Requirements

Biochemistry/Chemistry (25 advanced hours)	41
Biology Minor (12 advanced hours)	20
Physics	8
Math	7
Division of Science Electives	8
Core Curriculum	
English	6
History	6
American Government	6
Social and Behavioral Sciences	3
Cross Cultural, Diversity and Global Studies	3
Humanities	3
Literature	3
Visual and Performing Arts	3
Foreign Language	3-14
Electives	0-9
Advanced Oral/Written Communications	<u>3</u>
Minimum Hours	135

Note:

42 hours must be advanced, 24 advanced hours must be taken at UNT.

24 of last 30 hours must be completed at UNT

A total of 84 hours in science. of which 40 must be advanced

A minimum GPA of 2.5 required in all advanced courses attempted in the Division of Science.

Foreign Language Options For Students Completing B.S. Degree in Biochemistry

Note: Students must take foreign language for BA degree

Students seeking B.S. Degrees in Biochemistry under the 1999 or later University core (*see below) may complete either of two options to satisfy the College of Arts and Sciences foreign language requirement (**the Option II requirements for catalog years 1999 through 2003 are different than those listed here).

Option I: Complete two semesters of foreign language at the 2000 level or pass appropriate proficiency exam(s) as specified by the College of Arts and Sciences.

Option II: Complete three courses from the approved groups listed below (a minimum of 9 hours). A student who wishes to fulfill the foreign language requirement by Option II must first be counseled by an undergraduate adviser of the Department of Biological Sciences and must obtain written approval of Option II for inclusion in the student's degree plan. Students must choose one course from each group as follows for a total of 9 hours. All courses must be a minimum of 3 hours. Cooperative Education (4920) is excluded:

Group I: ENGL 4180 (required prerequisite is ENGL 2700)

Group II: One biochemistry course at the 3000 level or higher, including special problems; or one additional course from Group III

Group III: Select one course from the following (excludes special problems 4900-4910 courses): biology courses at the 3000 level or higher if they are not used to complete the biology minor; chemistry courses at the 3000 level or higher if they are not used in the biochemistry major; computer science courses for computer science majors that are at or above the CSCE 1020 level; GEOG 4400; GEOG 4500, GEOG 4520; GEOG 4550; GEOG 4560; MATH 1680; other math courses above the level of MATH 1720; PHIL 3250; PSYC 4640; or physics courses for physics majors at the 3000 level or higher.

*Students who entered UNT under earlier cores may update to the 1999-2000 core if they wish. However, all requirements of the 1999-2000 core must then be met. If you have questions about updating to the 1999-2000 core, contact the Arts and Science Student Advising Office, GAB Rm. 220 (x2051)

**Students who entered UNT under earlier cores may update to the 2004-2005 core if they wish. However, all requirements of the 2004-2005 core must then be met. If you have questions about updating to the 2004-2005 core, contact the Arts and Science Student Advising Office, GAB Rm. 220 (x2051)

<p>College of Arts & Sciences Degree Plan Preparation</p>	<p>What is a Degree Plan? A degree plan is an official contract between you and the University. It lists all the courses needed to complete your chosen degree and shows how all the courses you have completed are being applied toward your degree.</p> <p>When should I get a Degree Plan? You should request a degree plan after you have chosen a major and a minor, and completed approximately 45 hours. A transfer student should request a degree plan during his/her first semester at UNT. A student seeking secondary teacher certification may request a degree plan after completing approximately 30 hours. <u>You must have a degree plan on file in order to graduate.</u></p>
<p>How do I get a Biochemistry Degree Plan?</p>	<ol style="list-style-type: none"> 1 Contact the Department of Biological Sciences, indicating that you are requesting a degree plan. Department of Biological Sciences will need: a complete copy of all UNT transcripts, an <u>evaluated</u> copy of transcripts from all transfer institutions attended (evaluated means the transcripts have been processed by UNT's Office of the Registrar and show the number of hours accepted), and if you have transfer work, a catalog or catalog description of the courses you have completed. (All transcripts may be ordered at the UNT Office of the Registrar. You may pick them up or have them sent via inter-campus mail to the Department of Biological Sciences.) 2 Bring your transcripts to the Advising Secretary in BIOL 127 (allow 7-10 days if utilizing inter- campus mail). Schedule an appointment with a Biology advisor, through the Advising Secretary . 3 You and your faculty advisor will determine how completed courses will be used toward your major and which additional courses should be taken to complete the program. 4 Your advisor will then send the advisory sheet and transcripts to the Office of Student Advising, General Academic Building, Room 220. 5 The Office of Student Advising will begin processing your degree plan when they receive the necessary documents. A copy of the degree plan will be mailed to your permanent address (unless otherwise specified) and they will send a separate copy to the Department of Biological Sciences. The original will be kept on file in the College of Arts and Sciences Office of Student Advising. 6 It is your responsibility to update each semester's progress on your copy of the degree plan. You are encouraged to schedule an appointment with a departmental advisor if you feel you need assistance.
<p>Graduation Check</p>	<p>What is it? A Graduation Check is a service provided by the College of Arts and Sciences, Office of Student Advising to inform the student of the courses remaining for their last semester's enrollment.</p> <p>When do I need it? A Graduation Check should be requested the semester before you intend to graduate. (If you plan to graduate in spring, you should request a Grad Check by the end of the Fall Semester.) The Grad Check will be done at the end of the current semester after grades are posted, and will be available for pick up in GAB 220 by the schedule revision period. <u>Due to time constraints, graduation checks are not mailed.</u></p>

Note: All applicants are held personally responsible for the information in the graduation application instructions.