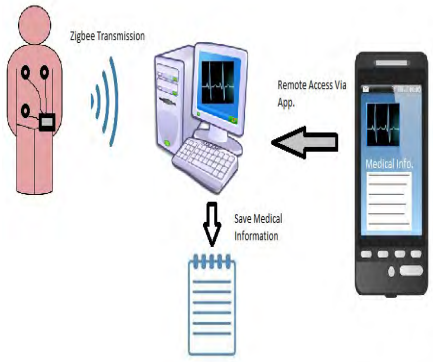
Biomedical Engineering Undergraduate Handbook



Catalog Year 2022-23

BIOMEDICAL ENGINEERING

Undergraduate Degree

- **Choose any one of the following 8 tracks:**
    - Comprehensive BMEN track (electives also from BMEN)
    - Bioinstrumentation (Minor in EE; electives from EE);
    - Biomechanics (Minor in ME; electives from ME);
    - Biocomputing (Minor in CSCE; electives from CSCE);
    - Biomaterials (Minor in MTSE; electives from MTSE);
    - Biotechnology (Minor in BIOL; electives from BIOL),
    - Pre-med,
    - Business
- Individual degree plans for each track are on following pages
- Only electives mentioned in the degree plans are allowed. No other requests will be entertained. This program is accredited by ABET.

BACHELOR'S DEGREE

DEGREE PLANS

BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Biotechnology Track

125 -126 SCH

2022-23

Recommended Course of Study

Freshman Year

Fall			Spring		
CHEM 1410	General Chemistry	3	PHYS 1710	Mechanics	3
CHEM 1430	General Chemistry Laboratory	1	PHYS 1730	Laboratory in Mechanics	1
ENGL 1310	College Writing I OR	3	HIST 2610	History I	3
TECM 1700	Intro to Technical Writing	3	TECM 2700	Technical Writing	3
BMEN 1300	Discover BMEN	3	MATH 1720	Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	3			
		17			17

Sophomore Year

Fall			Spring		
BIOL 1710	Principles of Biology I	3	BMEN 2320	Biomedical Instrumentation I	3
MATH 2700	Linear Algebra	3	MATH 3410	Differential Equations	3
CHEM 1420	Chemistry II	3	BIOL 1720	Biology II	3
CHEM 1440	Chemistry II lab	1	XXXX	Lang Phil Culture	3
BMEN 2210	Biomed DAQ Practises	3	XXXX	Visual and Performing Arts	3
PSCI 2305	American Government	3	BIOL 1760	Biology Lab	2
		16			17

Junior Year

Fall			Spring		
MATH 2730	Multivariate calculus	3	BMEN 3312	Introduction to Biomechanics	3
OR			MATH3680	Statistics and probability	3
MATH 3350	Intro to Numerical Analysis	3	BMEN 3321	Biomaterials	3
BMEN 3311	Biomedical Signal Analysis	3	HIST 2620	History II	3
BMEN 3350	Biomed Transport Phenom	3	BIOL 2041	Microbiology	3
BMEN 3310	Human Systems	3	BIOL 2042	Microbiology Lab	1
CHEM 2370 and 2780	Organic Chem I Lab	4.00			
		16			16

Senior Year

Fall			Spring		
BMEN XXXX	Advanced Topic in BMEN	3			
BIOL 3451/52	Genetics with Lab	4	BMEN XXXX	Advanced Topic in BMEN	3
BMEN 4212	Senior Design I	1	BMEN 4222	Senior Design II	3
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX	Advanced Topic in BMEN	3
XXXX	Social and Behavioral Sciences	3	XXXX	BIOL ELECTIVE	3
		14			12

University Core Courses in Green; Required courses in black; Prescribed electives in red; BIOL Electives in blue
Some Biology Courses may need pre-reqs; if these courses are not available at the time of registration, please visit with BMEN department advising.

BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Business Track

120 SCH

2022-23

Example Course of Study

Freshman Year

Fall			Spring		
	Science Lecture	3	PHYS 1710	Mechanics	3
	Science Lab	1	PHYS 1730	Laboratory in Mechanics	1
ENGL 1310	College Writing I OR	3	HIST 2610	History I	3
TECM 1700	Intro to Technical Writing	3	TECM 2700	Technical Writing	3
BMEN 1300	Discover BMEN	3	MATH 1720	Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	3			17
		17			

Sophomore Year

Fall			Spring		
XXXX	BUSINESS ELECTIVE 1	3	BMEN 2320	Biomedical Instrumentation I	3
MATH 2700	Linear Algebra	3	MATH 3410	Differential Equations	3
CHEM 1410	General Chemistry	3	XXXX	BUSINESS ELECTIVE 2	3
CHEM 1430	General Chemistry Laboratory	1	XXXX	Lang Phil Culture	3
BMEN 2210	Biomed DAQ Practises	3	XXXX	Visual and Performing Arts	3
PSCI 2305	American Government	3			
		16			15

Junior Year

Fall			Spring		
MATH 2730	Multivariate calculus	3	BMEN 3312	Introduction to Biomechanics	3
OR			MATH3680	Statistics and probability	3
MATH 3350	Intro to Numerical Analysis	3	BMEN 3321	Biomaterials	3
BMEN 3311	Biomedical Signal Analysis	3	HIST 2620	History II	3
BMEN 3350	Biomed Transport Phenom	3	XXXX	BUSINESS ELECTIVE 4	3
BMEN 3310	Human Systems	3			
XXXX	BUSINESS ELECTIVE 3	3			
		15			15

Senior Year

Fall			Spring		
BMEN XXXX	Advanced Topic in BMEN	3			
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX	Advanced Topic in BMEN	3
BMEN 4212	Senior Design I	1	BMEN 4222	Senior Design II	3
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX	Advanced Topic in BMEN	3
XXXX	Social and Behavioral Sciences	3	BMEN XXXX	Advanced Topic in BMEN	3
		13			12

University Core Courses in Green; Required courses in black; Prescribed electives in red; Business Electives in blue

Science course and lab: choice between A&P 1 or PHYS II or CHEM II

Business Electives from: management; marketing; business foundations; entrepreneurship

BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Comprehensive Biomedical Engineering Track

120 SCH

2022-23

Recommended Course of Study

Freshman Year

Fall			Spring		
CHEM 1410	General Chemistry	3	PHYS 1710	Mechanics	3
CHEM 1430	General Chemistry Laboratory	1	PHYS 1730	Laboratory in Mechanics	1
ENGL 1310	College Writing I OR	3	HIST 2610	History I	3
TECM 1700	Intro to Technical Writing	3	TECM 2700	Technical Writing	3
BMEN 1300	Discover BMEN	3	MATH 1720	Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	3			
		17			17

Sophomore Year

Fall			Spring		
MATH 2700	Linear Algebra	3	BMEN 2320	Biomedical Instrumentation I	3
CHEM 1420	General Chemistry II	3	MATH 3410	Differential Equations	3
CHEM 1440	General Chemistry II Laboratory	1	XXXX	Lang Phil Culture	3
BMEN 2210	Biomed DAQ Practises	3	XXXX	Visual and Performing Arts	3
PSCI 2305	American Government	3	HIST 2620	History II	3
		13			15

Junior Year

Fall			Spring		
MATH 2730	Multivariate calculus	3	BMEN 3312	Introduction to Biomechanics	3
OR			MATH3680	Statistics and probability	3
MATH 3350	Numerical Analysis	3	BMEN 3321	Biomaterials	3
BMEN 3311	Biomedical Signal Analysis	3	BMEN XXXX	Advanced BMEN elective	3
BMEN 3350	Biomed Transport Phenom	3	XXXX	Social and Behavioral Sciences	3
BMEN 3310	Human Systems	3			
BMEN XXXX	Advanced BMEN elective	3			
		15			15

Senior Year

Fall			Spring		
BMEN XXXX	Advanced BMEN elective	3	BMEN XXXX	Advanced Topic in BMEN	3
BMEN XXXX	Advanced BMEN elective	3	BMEN 4222	Senior Design II	3
BMEN 4212	Senior Design I	1	BMEN XXXX	Advanced Topic in BMEN	3
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX	Advanced BMEN elective	3
BMEN XXXX	Advanced Topic in BMEN	3			
BMEN XXXX	Advanced BMEN elective	3			
		16			12

University Core Courses in Green; Required courses in black; Prescribed electives in red; BMEN Electives in blue

BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Biocomputing Track (Minor in Computer Science)

120 SCH

2022-23

Recommended Course of Study

Freshman Year

Fall			Spring		
CHEM 1410	General Chemistry	3	PHYS 1710	Mechanics	3
CHEM 1430	General Chemistry Laboratory	1	PHYS 1730	Laboratory in Mechanics	1
ENGL 1310	College Writing I OR	3	HIST 2610	History I	3
TECM 1700	Intro to Technical Writing	3	TECM 2700	Technical Writing	3
BMEN 1300	Discover BMEN	3	MATH 1720	Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	3			17
		17			

Sophomore Year

Fall			Spring		
CSCE 1030	Computer Science I	3	BMEN 2320	Biomedical Instrumentation I	3
MATH 2700	Linear Algebra	3	MATH 3410	Differential Equations	3
PHYS 2220	Electricity and Magentism	3	CSCE 1040	Computer Science II	3
PHYS 2240	Physics II lab	1	XXXX	Lang Phil Culture	3
BMEN 2210	Biomed DAQ Practises	3	XXXX	Visual and Performing Arts	3
PSCI 2305	American Government	3			
		16			15

Junior Year

Fall			Spring		
MATH 2730	Multivariate calculus	3	BMEN 3312	Introduction to Biomechanics	3
OR			MATH3680	Statistics and probability	3
MATH 3350	Intro to Numerical Analysis	3	BMEN 3321	Biomaterials	3
BMEN 3311	Biomedical Signal Analysis	3	HIST 2620	History II	3
BMEN 3350	Biomed Transport Phenom	3	CSCE 2110	Computing Foundations II	3
BMEN 3310	Human Systems	3			
CSCE 2100	Computing Foundations I	3			
		15			15

Senior Year

Fall			Spring		
BMEN XXXX	Advanced Topic in BMEN	3			
XXXX	CSCE ELECTIVE	3	BMEN XXXX	Advanced Topic in BMEN	3
BMEN 4212	Senior Design I	1	BMEN 4222	Senior Design II	3
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX	Advanced Topic in BMEN	3
XXXX	Social and Behavioral Sciences	3	XXXX	CSCE ELECTIVE	3
		13			12

University Core Courses in Green; Required courses in black; Prescribed electives in red; CSCE Electives in blue

BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Bioinstrumentation Track (Minor in Electrical Engineering)

120 SCH

2022-23

Recommended Course of Study

Freshman Year

Fall			Spring		
CHEM 1410	General Chemistry	3	PHYS 1710	Mechanics	3
CHEM 1430	General Chemistry Laboratory	1	PHYS 1730	Laboratory in Mechanics	1
ENGL 1310	College Writing I OR	3	HIST 2610	History I	3
TECM 1700	Intro to Technical Writing	3	TECM 2700	Technical Writing	3
BMEN 1300	Discover BMEN	3	MATH 1720	Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	3			
		17			17

Sophomore Year

Fall			Spring		
EENG 2710	Digital Logic Design	3	BMEN 2320	Biomedical Instrumentation I	3
EENG 2711	Digital Design Lab	1	MATH 3410	Differential Equations	3
MATH 2700	Linear Algebra	3	EENG 2610	Circuit Analysis	3
PHYS 2220	Electricity and Magnetism	3	EENG 2611	Circuit Analysis Lab	1
PHYS 2240	Physics II lab	1	XXXX	Lang Phil Culture	3
BMEN 2210	Biomed DAQ Practises	3	XXXX	Visual and Performing Arts	3
PSCI 2305	American Government	3			
		17			16

Junior Year

Fall			Spring		
MATH 2730	Multivariate calculus OR	3	BMEN 3312	Introduction to Biomechanics	3
MATH 3350	Intro to Numerical Analysis	3	MATH3680	Statistics and probability	3
BMEN 3311	Biomedical Signal Analysis	3	BMEN 3321	Biomaterials	3
BMEN 3350	Biomed Transport Phenom	3	HIST 2620	History II	3
BMEN 3310	Human Systems	3			
EENG 2620	Signals and Systems	3			
EENG 2621	Signals and Systems Lab	1			
		16			12

Senior Year

Fall			Spring		
BMEN XXXX	Advanced Topic in BMEN	3			
EENG 3510	Electronics I	3	BMEN XXXX	Advanced Topic in BMEN	3
BMEN 4212	Senior Design I	1	BMEN 4222	Senior Design II	3
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX	Advanced Topic in BMEN	3
XXXX	Social and Behavioral Sciences	3	EENG	4000-Level EE ELECTIVE	3
		13			12

University Core Courses in Green; Required courses in black; Prescribed electives in red; EE Electives in blue

BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Biomechanics Track (Minor in Mechanical Engineering)

(120 + 3) SCH

2022-23

Recommended Course of Study

Freshman Year

Fall			Spring		
CHEM 1410	General Chemistry	3	PHYS 1710	Mechanics	3
CHEM 1430	General Chemistry Laboratory	1	PHYS 1730	Laboratory in Mechanics	1
ENGL 1310	College Writing I OR	3	HIST 2610	History I	3
TECM 1700	Intro to Technical Writing	3	TECM 2700	Technical Writing	3
BMEN 1300	Discover BMEN	3	MATH 1720	Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	3			
		17			17

Sophomore Year

Fall			Spring		
MEEN 2301	Mechanics I	3	BMEN 2320	Biomedical Instrumentation I	3
MATH 2700	Linear Algebra	3	MATH 3410	Differential Equations	3
CHEM 1420	General Chemistry II	3	MEEN 2302	Mechanics II	3
CHEM 1440	General Chemistry II Laboratory	1	XXXX	Lang Phil Culture	3
BMEN 2210	Biomed DAQ Practises	3	XXXX	Visual and Performing Arts	3
PSCI 2305	American Government	3			
		16			15

Junior Year

Fall			Spring		
MATH 2730	Multivariate calculus	3	BMEN 3312	Introduction to Biomechanics	3
OR			MATH3680	Statistics and probability	3
MATH 3350	Intro to Numerical Analysis	3	BMEN 3321	Biomaterials	3
BMEN 3311	Biomedical Signal Analysis	3	HIST 2620	History II	3
BMEN 3350	Biomed Transport Phenom	3	MEEN 2332	Mechanics III	3
BMEN 3310	Human Systems	3			
MEEN 2210	Thermodynamics	3			
		15			15

Senior Year

Fall			Spring		
BMEN XXXX	Advanced Topic in BMEN	3			
XXXX	MEEN ELECTIVE	3	BMEN XXXX	Advanced Topic in BMEN	3
BMEN 4212	Senior Design I	1	BMEN 4222	Senior Design II	3
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX	Advanced Topic in BMEN	3
XXXX	Social and Behavioral Sciences	3	XXXX	MEEN ELECTIVE	3
			***XXXX	MEEN ELECTIVE	3
		13			15

*** To get ME minor

University Core Courses in Green; Required courses in black; Prescribed electives in red; ME Electives in blue

BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Biomaterials Track (Minor in Materials Science and Engineering)

120 SCH

2022-23

Recommended Course of Study

Freshman Year

Fall			Spring		
CHEM 1410	General Chemistry	3	PHYS 1710	Mechanics	3
CHEM 1430	General Chemistry Laboratory	1	PHYS 1730	Laboratory in Mechanics	1
ENGL 1310	College Writing I OR	3	HIST 2610	History I	3
TECM 1700	Intro to Technical Writing	3	TECM 2700	Technical Writing	3
BMEN 1300	Discover BMEN	3	MATH 1720	Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	3			
		17			17

Sophomore Year

Fall			Spring		
MTSE 3000	Fundamentals of MTSE	3	BMEN 2320	Biomedical Instrumentation I	3
MATH 2700	Linear Algebra	3	MATH 3410	Differential Equations	3
CHEM 1420	General Chemistry II	3	XXXX	MTSE ELECTIVE	3
CHEM 1440	General Chemistry II Laboratory	1	XXXX	Lang Phil Culture	3
BMEN 2210	Biomed DAQ Practises	3	XXXX	Visual and Performing Arts	3
PSCI 2305	American Government	3			
		16			15

Junior Year

Fall			Spring		
MATH 2730	Multivariate calculus	3	BMEN 3312	Introduction to Biomechanics	3
OR			MATH3680	Statistics and probability	3
MATH 3350	Intro to Numerical Analysis	3	BMEN 3321	Biomaterials	3
BMEN 3311	Biomedical Signal Analysis	3	HIST 2620	History II	3
BMEN 3350	Biomed Transport Phenom	3	XXXX	MTSE ELECTIVE	3
BMEN 3310	Human Systems	3			
XXXX	MTSE ELECTIVE	3			
		15			15

Senior Year

Fall			Spring		
BMEN XXXX	Advanced Topic in BMEN	3			
XXXX	MTSE ELECTIVE	3	BMEN XXXX	Advanced Topic in BMEN	3
BMEN 4212	Senior Design I	1	BMEN 4222	Senior Design II	3
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX	Advanced Topic in BMEN	3
XXXX	Social and Behavioral Sciences	3	XXXX	MTSE ELECTIVE	3
		13			12

University Core Courses in Green; Required courses in black; Prescribed electives in red; MTSE Electives in blue

BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Pre-Med Track = Biotech track + extra courses

(125/126 + Pre-med Requirement) SCH

2022-23

Recommended Course of Study

Freshman Year

Fall			Spring		
CHEM 1410	General Chemistry	3	PHYS 1710	Mechanics	3
CHEM 1430	General Chemistry Laboratory	1	PHYS 1730	Laboratory in Mechanics	1
ENGL 1310	College Writing I OR	3	HIST 2610	History I	3
TECM 1700	Intro to Technical Writing	3	TECM 2700	Technical Writing	3
BMEN 1300	Discover BMEN	3	MATH 1720	Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	3			
		17			17

Sophomore Year

Fall			Spring		
BIOL 1710	Principles of Biology I	3	BMEN 2320	Biomedical Instrumentation I	3
MATH 2700	Linear Algebra	3	MATH 3410	Differential Equations	3
CHEM 1420	General Chemistry II	3	BIOL 1720	Biology II	3
CHEM 1440	General Chemistry II Laboratory	1	XXXX	Lang Phil Culture	3
BMEN 2210	Biomed DAQ Practises	3	XXXX	Visual and Performing Arts	3
PSCI 2305	American Government	3	BIOL 1760	Biology Lab	2
		16			17

Junior Year

Fall			Spring		
MATH 2730	Multivariate calculus	3	BMEN 3312	Introduction to Biomechanics	3
OR			MATH3680	Statistics and probability	3
MATH 3350	Intro to Numerical Analysis	3	BMEN 3321	Biomaterials	3
BMEN 3311	Biomedical Signal Analysis	3	HIST 2620	History II	3
BMEN 3350	Biomed Transport Phenom	3	BIOL 2041	Microbiology	3
BMEN 3310	Human Systems	3	BIOL 2042	Microbiology Lab	1
CHEM 2370/8	Organic Chemistry I with Lab	4			
		16			16

Senior Year

Fall			Spring		
BMEN XXXX	Advanced Topic in BMEN	3			
BIOL 3451	Genetics	3	BMEN XXXX	Advanced Topic in BMEN	3
BIOL 3452	Genetics Lab	1	BMEN 4222	Senior Design II	3
BMEN 4212	Senior Design I	1	BMEN XXXX	Advanced Topic in BMEN	3
BMEN XXXX	Advanced Topic in BMEN	3	XXXX	BIOL/BIOC ELECTIVE	3
XXXX	Social and Behavioral Sciences	3			
		14			12

University Core Courses in Green; Required courses in black; Prescribed electives in red; Electives in blue

***** THIS DEGREE PLAN MAY TAKE MORE THAN 4 YEARS TO COMPLETE*****

CHECK PRE-MED CATALOG FOR ADDITIONAL COURSES

COLLEGE OF SCIENCE
UNT
EST. 1890

PRE-MEDICAL

General Prerequisite Coursework for Texas Medical Schools

BIOL 1710 (3hrs) General Biology I
BIOL 1720 (3hrs) General Biology II
BIOL 1760 (2hrs) General Biology Lab
BIOL Electives (6hrs)
Recommended: BIOL 2041/2042, BIOL 3800, BIOL 3510, or BIOL 3451
CHEM 1410/1430 (4hrs) General Chemistry I
CHEM 1420/1440 (4hrs) General Chemistry II
CHEM 2370/3210 (4hrs) Organic Chemistry I
CHEM 2380/3220 (4hrs) Organic Chemistry II
BIOC 3621 (3hrs) Principles of Biochemistry*
Alternatives: BIOC 4540 and BIOC 4550
Physics I for Science Majors (4 hrs)**
Physics II for Science Majors (4 hrs)**
ENGL 1310 (3hrs) College Writing I or
TECM 1700 (3hrs) Intro to Technical Writing
ENGL 1320 3hrs) College Writing II or
TECM 2700 (3hrs) Technical Writing
MATH 1680 (3hrs) Elementary Probability and Statistics

**Biochemistry is not required for all schools. See below for more information*

***Medical Schools require Physics Courses for science majors. Please see your major advisor for information on which physics are required for your degree*

+TCU/UNTHSC has different requirements, please see below

A 'C' or better is required in all coursework
Completion of a degree is STRONGLY recommended

Additional Information by School

Baylor College of Medicine

Requirements include:
- *3-4 hours of Math (Calculus, Stats, or Physics)*
- *3-4 hours of Writing (See website for approved courses)*
- *12 hours of Humanities/Social Sciences (See website for options)*
- *6-8 hours of Organic Chemistry (lab is not required)*
- *3-4 hours of Biochemistry (lab is not required)*
- *3-4 hours of Advanced Biology (lab is not required)*
  - *Highly recommended: BIOL 3510 and BIOL 3451*
- *Recommended: Spanish*

Dell Medical School

Requirements include:
- *11 hours of Biology (2 hours must be from labs)*
  - *Recommended: BIOL 3451*
- *8 hours of Physics*
- *12 hours of Chemistry (See website for options)*
- *3 hours of Biochemistry*
- *3 hours of English Composition*
- *3 hours of Statistics*

Paul L. Foster

Biochemistry is required, and can help satisfy either the Biology or Chemistry requirements

Recommended: 12 hours of Humanities, Social Sciences, or Behavioral Sciences

Recommended advanced sciences:
- *BIOL 4201, BIOL 3451, and BIOL 3510*

Sam Houston State University College of Osteopathic Medicine

Biochemistry can be substituted for Organic Chemistry II

6 hours of mathematics (3 hours must be Statistics)

TAMU Health Science Center

8 of the 14 hours of Biology must be General Biology

*6 of the 14 hours of Biological sciences must be at the **advanced level**; Biochemistry is required, but 3 of the advanced Biology hours must be from Biochemistry*

+Texas Christian University/UNTHSC School of Medicine

Requirements include:
- *1 semester of Biochemistry (BIOC 3621 or 4540)*
- *1 semester of Genetics (BIOL 3451)*
- *1 semester of Physiology (BIOL 2301/2311 OR 2302/2312)*
- *1 semester of Statistics (MATH 1680)*
- *1 semester of English Composition (ENGL 1310)*
- *2 semesters of Social and Behavioral Sciences (See website for options)*
- *2 semesters of Humanities (See website for options)*

**Please see advisor for specific coursework*

Texas College of Osteopathic Medicine (UNTHSC)

1 semester of Biochemistry is NOT required

Recommended for BIOL elective:
- *BIOL 3510, BIOL 2301/2311, BIOL 2302/2312, BIOL 2041*

Texas Tech HSC

*Of the 14 hours of biology, 6 must be at the **advanced level***

*Biochemistry is **required** and can be used toward the Biology or Chemistry requirement*

UIW School of Osteopathic Medicine

Biochemistry is not required, but recommended

Only requires 8 hours of Biology (more is encouraged)

6 hours of Philosophy or related Humanities coursework is recommended; advanced behavioral science also preferred

Statistics is not required, but 6 hours of coursework in Math or Statistics is recommended

Recommended advanced sciences:
- *BIOL 3451, BIOL 4201, BIOL 2301/2311, BIOL 2302/2312, BIOL 4751 or 4752, BIOL 3510, BIOL 2041/2042*

University of Houston College of Medicine

Requirements include:
- *3 hours advanced Biology*

Recommended science: BIOL 2301, BIOL 4201

Recommended: foreign language

UTHSC-Houston (McGovern)

Biochemistry accepted towards 14hrs of BIOL (not required)

Only one year of Biology can be completed by AP credit

No Math course is required; familiarity with statistics and psychology preferred

UT Medical Branch

Statistics or Calculus is accepted

Biochemistry is not required (but recommended)

Recommended: BIOL 2301/2311, BIOL 2302/2312, BIOL 2041/2042, BIOL 4201, BIOL 3451, BIOL 3510, BIOC 3621 or BIOC 4540 or 4550, BIOL 4330

University of Texas Rio Grande Valley

Biochemistry course may be used towards the Biology or Chemistry requirements

Calculus does not meet Math Requirement

UTHSC San Antonio (Long School of Medicine)

Biochemistry course may be used towards the Biology or Chemistry requirements

UT Southwestern

1 semester of Biochemistry is accepted towards the Biology requirement (only if two semesters completed)

Recommended for BIOL elective:
- *BIOL 3451, BIOL 4201, BIOL 4055, BIOL 2301/2311, BIOL 2302/2312, BIOL 4290, BIOL 2140, BIOL 2041/2042, BIOL 4091*

1 semester of Biochemistry is required (see general gray box)

Math: 1 semester of Calculus OR Statistics

Only requires 4 hrs of General Chemistry

Scan the QR code to the left for more information on Texas Medical Schools, MCAT preparation, pre-health organizations, application services, Health Professions Student Development Certificate and how to schedule an advising appointment

Program requirements may change without notice and vary with each school; you are still responsible for checking schools' websites for admissions information. Please see your academic advisor to further explore the requirements of the school in which you are interested.

Mapping the Pre-Medical Journey

*With the help of your advisor, use the prerequisite courses listed on the following page to create an individual plan for your pre-medical ambitions. Because circumstances can change and differ over time, this is an **unofficial** timeline and should be re-evaluated each semester.*

FALL _____	Hrs.		SPRING _____	Hrs.

SUMMER I	Hrs.		SUMMER II	Hrs.

FALL _____	Hrs.		SPRING _____	Hrs.

SUMMER I	Hrs.		SUMMER II	Hrs.

FALL _____	Hrs.		SPRING _____	Hrs.

Fall Timeline
Attend "What Should I Be Doing Now?" Seminar
Attend personal essay workshops
MCAT Preparation

Spring Timeline
Attend HPAC Seminar
HPAC Application due in March
MCAT Prep/Take Exam (June or July)

Summer: Apply to medical schools through TMDSAS, AMCAS, and/or AACOMAS. Interviews with medical schools are typically July-December.

FALL _____	Hrs.		SPRING _____	Hrs.

Fall Timeline
Medical School Interviews

Spring Timeline
January—Deadline for Submitting Match List to TMDSAS
February—Match Date (Informed by TMDSAS)

To contact your pre-health advisor, scan the QR code above. On that site, under "Office of Health Professions Pre-Health Advising" You will find the contact information for each advisor.
General Email: Healthcareers@unt.edu

UNT Office of Health Professions
Hickory Hall, 256
1155 Union Circle #311365
Denton, TX 76203

To schedule an appointment, please visit appointments.unt.edu

Phone: 940-369-8606
Website: healthcareers.unt.edu

Last Updated May 2020

UNDERGRADUATE MINORS

Computer Science and Engineering minor

A minor in computer science and engineering consists of a minimum of 19 semester hours of computer science and engineering courses, including 6 advanced hours.

Six hours of advanced courses must be taken at UNT.

Required courses

- CSCE 1030 - Computer Science I
- CSCE 1040 - Computer Science II
- CSCE 2100 - Computing Foundations I
- CSCE 2110 - Computing Foundations II

Electrical Engineering minor

A minor in electrical engineering requires a total of 18 semester hours of electrical engineering courses, including 6 hours of advanced courses. Six hours of advanced courses must be taken at UNT.

Required courses

EENG 2610 - Circuit Analysis
EENG 2611 - Circuit Analysis Lab
EENG 2620 - Signals and Systems
EENG 2621 - Signals and Systems Lab
EENG 2710 - Digital Logic Design
EENG 2711 - Digital Logic Design Lab
EENG 3510 - Electronics I (Devices and Materials)
One EE elective. (EE electives are defined as 4000-level organized EE courses, including EENG 4010 and EENG 4900 but excluding EENG 4910, EENG 4920, EENG 4951 and EENG 4990.)

Materials Science and Engineering minor

The minor in materials science and engineering requires a total of 18 semester credit hours:

Required

- MTSE 3000- - Fundamentals of MTSE
- Plus 15 hours of materials science and engineering courses, at least 6 of which should be chosen from the four core courses:

Core courses

- MTSE 3010 - Bonding and Structure
- MTSE 3030 - Thermodynamics and Phase Diagrams
- MTSE 3050 - Mechanical Properties of Materials
- MTSE 3070 - Electrical, Optical and Magnetic Properties of Materials

Additional requirements

The remaining hours can be from any other 3000- or 4000-level materials science engineering courses.

Mechanical Engineering minor

The minor in mechanical and energy engineering requires a total of 18 semester credit hours.

Required courses, 9 hours

- MEEN 2210 - Thermodynamics I
-
- MEEN 2302 - Mechanics II
- or
- ENGR 2302 - Dynamics
-
- MEEN 2332 - Mechanics III
- or
- ENGR 2332 - Mechanics of Materials

Additional courses, 9 hours

Chosen from the following:

- MEEN 3100 - Manufacturing Processes
- MEEN 3110 - Thermodynamics II
- MEEN 3120 - Fluid Mechanics
- MEEN 3130 - Machine Elements
- MEEN 3210 - Heat Transfer
- MEEN 3230 - System Dynamics and Control
- MEEN 3240 - Mechanical and Energy Engineering Laboratory I
- MEEN 3242 - Mechanical and Energy Engineering Laboratory II
- MEEN 4110 - Alternative Energy Sources
- MEEN 4140 - Finite Element Analysis
- Or other 3000- or 4000-level MEEN courses with the approval of MEE undergraduate advisor

Biological Sciences Minor

The minor requires a minimum of 18 hours with at least 6 advanced BIOL hours. Courses in the minor must be at least 3 hours.

Satisfactory completion of

- BIOL 1710 - Biology for Science Majors I or
- BIOL 1711 - Honors Biology for Science Majors I
- and
- BIOL 1720 - Biology for Science Majors II or
- BIOL 1722 - Honors Biology for Science Majors II
- and
- BIOL 1760 - Biology for Science Majors Laboratory or
- BIOL 1761 - Honors Biology for Science Majors Laboratory
-
- BIOL 2041 - Microbiology and
- BIOL 2042 - Microbiology Laboratory
- or
- BIOL 2140 - Principles of Ecology
- or
- BIOL 2241 - Biology of Higher Plants
- or
- BIOL 2251 - Biodiversity and Conservation of Animals
-
- and at least two upper-level BIOL courses, one of which must include a laboratory.

Notes

- The following courses may not be used toward a minor in biology: BIOL 3030, BIOL 3500, BIOL 4080, BIOL 4160/BIOL 4170, BIOL 4180/BIOL 4190, BIOL 4800, BIOL 4805, BIOL 4850, BIOL 4900, BIOL 4910, BIOL 4920, BIOL 4940, BIOL 4950 and BIOL 4951.
- Advanced electives in the minor should be selected in consultation with an advisor in the Department of Biological Sciences.
- Students must meet all prerequisites for courses before enrolling.

Business Tracks:

Business Foundations minor

The business foundations minor is designed to provide a foundation in business concepts, operations and practice. The program consists of six courses (18 hours) that may be taken by non-business students in good academic standing.

Students may select from one of two tracks within the minor, but may not combine courses across tracks.

General prerequisites for both tracks

Completion of the university core mathematics and economics requirements. ACCT 2010 and ACCT 2020 are prerequisites for all upper-division (3000- and 4000-level) business courses. ECON 1110 is strongly recommended.

General business track

This track is directed toward students who desire a broad grounding in the various business disciplines. Required courses include:

ACCT 2010 - Accounting Principles I (Financial Accounting)
ACCT 2020 - Accounting Principles II (Managerial Accounting)
MKTG 3650 - Foundations of Marketing Practice

MGMT 3720 - Organizational Behavior
or
MGMT 3820 - Management Concepts

FINA 3770 - Finance
Three hours chosen from any 3000- or 4000-level business courses (subject to all course prerequisites)

MBA preparation track

This track is designed for students who are considering continuing their studies in an MBA program. The courses on the list will meet many of the leveling requirements required of non-business majors entering an MBA program. Required courses include:

ACCT 2010 - Accounting Principles I (Financial Accounting)
ACCT 2020 - Accounting Principles II (Managerial Accounting)
Plus four courses chosen from

BCIS 3610 - Basic Information Systems
DSCI 3710 - Business Statistics with Spreadsheets
BLAW 3430 - Legal and Ethical Environment of Business
FINA 3770 - Finance
OPSM 3830 - Operations Management
MKTG 3650 - Foundations of Marketing Practice
Note

BCIS 3610, DSCI 3710 and OPSM 3830 have prerequisites not included in the minor.

Management minor

A minor in management is open to non-business majors and requires 18 hours.

Organizational behavior, 3 hours

MGMT 3720 - Organizational Behavior

Plus 15 hours from

MGMT 3330 - Communicating in Business
MGMT 3820 - Management Concepts
OPSM 3830 - Operations Management
MGMT 3850 - Foundations of Entrepreneurship
MGMT 3860 - Human Resource Management
MGMT 3870 - Management Research Methods
MGMT 3880 - Business Ethics and Social Responsibility
MGMT 4170 - Employee and Labor Relations
MGMT 4180 - Workplace Health and Safety
MGMT 4210 - E-Management: Managing in a Digital Economy
MGMT 4300 - Recruitment, Selection and Placement
MGMT 4460 - Topics in Organizational Behavior
MGMT 4470 - Leadership
MGMT 4660 - International Management Perspectives
OPSM 4810 - Purchasing and Materials Management
OPSM 4820 - Manufacturing Planning and Control
OPSM 4830 - Productivity and Quality Management
MGMT 4840 - Compensation and Benefits Administration
MGMT 4860 - Organizational Design and Change
OPSM 4880 - Management of Projects and Systems

Note

Students should check prerequisites and scheduled course offerings in order to satisfy course prerequisites and to register for courses in the appropriate sequence.

Marketing minor

A minor in marketing requires 18 hours.

Required course, 3 hours

MKTG 3650 - Foundations of Marketing Practice

Plus 15 hours from

MKTG 2650 - Culture and Consumption
MKTG 3010 - Professional Selling
MKTG 3660 - Advertising Management
MKTG 3700 - Marketing Metrics
MKTG 3710 - Marketing Research and Analytics
MKTG 3720 - Internet Marketing Concepts and Strategy
MKTG 4120 - Consumer Behavior
MKTG 4280 - Global Marketing Issues and Practice
MKTG 4320 - New Product Development
MKTG 4330 - Strategic Brand Management
MKTG 4520 - Marketing Channels and Strategic Partnerships
MKTG 4600 - Retailing
MKTG 4620 - E-Commerce Marketing Tools and Applications
MKTG 4630 - Retailing II
MKTG 4750 - Services Marketing
MKTG 4800 - Internship in Marketing
MKTG 4880 - Advanced Marketing Management
MKTG 4890 - Applied Marketing Problems
LSCM 3960 - Logistics and Supply Chain Management
LSCM 4360 - Global Alliances and International Supply Chain Management
LSCM 4530 - E-Logistics in Supply Chain Management
LSCM 4560 - Business Transportation Management

Entrepreneurship minor

Requires 18 hours (6 courses, as follows):

Required courses

MGMT 3820 - Management Concepts
MGMT 3850 - Foundations of Entrepreneurship

Plus four courses from

MGMT 3720 - Organizational Behavior
MGMT 3810 - Principles of Family Business
MGMT 3915 - Creativity and Opportunity Development
MGMT 4210 - E-Management: Managing in a Digital Economy
MGMT 4220 - Advanced Entrepreneurship
MGMT 4235 - Social Entrepreneurship
MGMT 4335 - Technology and Innovation Management
MGMT 4560 - Topics in Entrepreneurship

Note

Students should check prerequisites and scheduled course offerings in order to satisfy course prerequisites and to register for courses in the appropriate sequence.