

# Biomedical Engineering Undergraduate Handbook



Catalog Year 2021-22

# **BIOMEDICAL ENGINEERING**

## **Undergraduate Degree**

- 3-in-1 degree:
  - Major in BME
  - Minor in Math
  - Minor in one of EE/MEEN/CSCE/MTSE/BIOL
  
- **Choose any one of the following 7 tracks:**
  - 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. We are an ABET-accredited program.

**BACHELOR'S DEGREE**

**DEGREE PLANS**

**BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING**

Biocomputing Track (Minor in Computer Science)

120 SCH

2021-22

Recommended Course of Study**Freshman Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>			
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**

<b><u>Fall</u></b>		<b><u>Spring</u></b>			
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 Magnetism	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**

<b><u>Fall</u></b>		<b><u>Spring</u></b>			
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**

<b><u>Fall</u></b>		<b><u>Spring</u></b>			
BMEN 4310	Biomedical Modeling	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

2021-22

### Recommended Course of Study

#### Freshman Year

<u>Fall</u>		<u>Spring</u>		
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
<b>BMEN 1300</b>	<b>Discover BMEN</b>	<b>3</b>	<b>MATH 1720 Calculus II</b>	<b>3</b>
MATH 1710	Calculus I	4	BMEN 1400 Software for Biomedical Engineers	4
PSCI 2306	American Government	3		
		<u>17</u>		<u>17</u>

#### Sophomore Year

<u>Fall</u>		<u>Spring</u>		
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		
		<u>17</u>		<u>16</u>

#### Junior Year

<u>Fall</u>		<u>Spring</u>		
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		
		<u>16</u>		<u>12</u>

#### Senior Year

<u>Fall</u>		<u>Spring</u>		
BMEN 4310	Biomedical Modeling	3	BMEN XXXX Advanced Topic in BMEN	3
EENG 3510	Electronics I	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	EENG 4000-Level EE ELECTIVE	3
XXXX	Social and Behavioral Sciences	3		
		<u>13</u>		<u>12</u>

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

2021-22

Recommended Course of Study

**Freshman Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>			
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
<b>BMEN 1300</b>	<b>Discover BMEN</b>	<b>3</b>	<b>MATH 1720</b>	<b>Calculus II</b>	<b>3</b>
MATH 1710	Calculus I	4	BMEN 1400	Software for Biomedical Engineers	4
PSCI 2306	American Government	<u>3</u>			
		<u>17</u>			<u>17</u>

**Sophomore Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>			
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	<u>3</u>
PSCI 2305	American Government	3			
		<u>16</u>			<u>15</u>

**Junior Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>			
MATH 2730	Multivariate calculus	3	BMEN 3312	Introduction to Biomechanics	<u>3</u>
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	<u>3</u>			
		<u>15</u>			<u>15</u>

**Senior Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>			
BMEN 4310	Biomedical Modeling	3	BMEN XXXX	Advanced Topic in BMEN	3
XXXX	MEEN ELECTIVE	3	BMEN 4222	Senior Design II	3
BMEN 4212	Senior Design I	<u>1</u>	BMEN XXXX	Advanced Topic in BMEN	3
BMEN XXXX	Advanced Topic in BMEN	3	XXXX	MEEN ELECTIVE	3
XXXX	Social and Behavioral Sciences	3	***XXXX	MEEN ELECTIVE	<u>3</u>
		<u>13</u>			<u>15</u>

\*\*\* 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

2021-22

Recommended Course of Study

**Freshman Year**

<b><u>Fall</u></b>			<b><u>Spring</u></b>		
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
<b>BMEN 1300</b>	<b>Discover BMEN</b>	<b>3</b>	<b>MATH 1720</b>	<b>Calculus II</b>	<b>3</b>
MATH 1710	Calculus I	4	<b>BMEN 1400</b>	<b>Software for Biomedical Engineers</b>	<b>4</b>
PSCI 2306	American Government	<u>3</u>			
		<u>17</u>			<u>17</u>

**Sophomore Year**

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

**Junior Year**

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

**Senior Year**

<b><u>Fall</u></b>			<b><u>Spring</u></b>		
<b>BMEN 4310</b>	<b>Biomedical Modeling</b>	<b>3</b>	<b>BMEN XXXX</b>	<b>Advanced Topic in BMEN</b>	<b>3</b>
<b>XXXX</b>	<b>MTSE ELECTIVE</b>	<b>3</b>	<b>BMEN 4222</b>	<b>Senior Design II</b>	<b>3</b>
<b>BMEN 4212</b>	<b>Senior Design I</b>	<b><u>1</u></b>	<b>BMEN XXXX</b>	<b>Advanced Topic in BMEN</b>	<b>3</b>
<b>BMEN XXXX</b>	<b>Advanced Topic in BMEN</b>	<b>3</b>	<b>XXXX</b>	<b>MTSE ELECTIVE</b>	<b>3</b>
<b>XXXX</b>	<b>Social and Behavioral Sciences</b>	<b>3</b>			
		<u>13</u>			<u>12</u>

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

**BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING**

Biotechnology Track

125 -126 SCH

2021-22

Recommended Course of Study

**Freshman Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>		
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
<b>BMEN 1300</b>	<b>Discover BMEN</b>	3	<b>MATH 1720</b> Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400 Software for Biomedical Engineers	4
PSCI 2306	American Government	3		
		17		17

**Sophomore Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>		
<b>BIOL 1710</b>	<b>Principles of Biology I</b>	3	BMEN 2320 Biomedical Instrumentation I	3
MATH 2700	Linear Algebra	3	MATH 3410 Differential Equations	3
CHEM 1420	Chemistry II	3	<b>BIOL 1720</b> <b>Biology II</b>	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	<b>BIOL 1760</b> <b>Biology Lab</b>	2
		16		17

**Junior Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>		
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	<b>BIOL 2041</b> <b>Microbiology</b>	3
BMEN 3310	Human Systems	3	<b>BIOL 2042</b> <b>Microbiology Lab</b>	1
<b>CHEM 2370</b>	<b>Organic Chem I</b>	4.00		
and 2780	Lab	16		16

**Senior Year**

<b><u>Fall</u></b>		<b><u>Spring</u></b>		
BMEN 4310	Biomedical Modeling	3		
<b>BIOL 3451/52</b>	<b>Genetics with Lab</b>	4	<b>BMEN XXXX</b> <b>Advanced Topic in BMEN</b>	3
BMEN 4212	Senior Design I	1	BMEN 4222 Senior Design II	3
<b>BMEN XXXX</b>	<b>Advanced Topic in BMEN</b>	3	<b>BMEN XXXX</b> <b>Advanced Topic in BMEN</b>	3
XXXX	Social and Behavioral Sciences	3	<b>XXXX</b> <b>BIOL ELECTIVE</b>	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

Pre-Med Track = Biotech track + extra courses

(125/126 + Pre-med Requirement) SCH

2021-22

### Recommended Course of Study

#### Freshman Year

<u>Fall</u>		<u>Spring</u>		
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
<b>BMEN 1300</b>	<b>Discover BMEN</b>	3	<b>MATH 1720</b> Calculus II	3
MATH 1710	Calculus I	4	BMEN 1400 Software for Biomedical Engineers	4
PSCI 2306	American Government	3		
		<u>17</u>		17

#### Sophomore Year

<u>Fall</u>		<u>Spring</u>		
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
<b>BMEN 2210</b>	<b>Biomed DAQ Practises</b>	3	XXXX Visual and Performing Arts	3
PSCI 2305	American Government	3	BIOL 1760 Biology Lab	2
		16		17

#### Junior Year

<u>Fall</u>		<u>Spring</u>		
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

<u>Fall</u>		<u>Spring</u>		
BMEN 4310	Biomedical Modeling	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

# PRE-MEDICAL

Office of Health Professions, University of North Texas

2016-17

## Texas Medical Schools

University of Texas Southwestern Medical Center  
University of Texas Health Science Center—Houston Medical School  
University of Texas Health Science Center—San Antonio Medical School  
Texas A&M University Health Science Center  
University of North Texas Health Science Center  
Paul L. Foster School of Medicine  
University of Texas Medical Branch —Galveston  
Texas Tech University Health Sciences Center  
Baylor College of Medicine  
Dell Medical School  
University of Texas Rio Grande Valley  
UIW School of Osteopathic Medicine

## Applying to Medical School

Application services include:

- Texas Medical and Dental Schools Application Service, [www.tmdsas.com](http://www.tmdsas.com)
- American Medical College Application Service, [www.aamc.org](http://www.aamc.org) (Baylor College of Medicine and allopathic schools outside of Texas)
- American Association of Colleges of Osteopathic Medicine Application Service, [www.aacom.org](http://www.aacom.org) (used for osteopathic schools outside of Texas)

**Debrah A. Beck, Ph.D.**  
Assistant Dean for  
Health Professions  
[debrah.beck@unt.edu](mailto:debrah.beck@unt.edu)

**Todd Lang, M.S.**  
Senior Academic Counselor  
[todd.lang@unt.edu](mailto:todd.lang@unt.edu)

**Mardreana Reed, M.Ed.**  
Academic Counselor  
[mardreana.reed@unt.edu](mailto:mardreana.reed@unt.edu)

UNT Health Professions Program  
General Academic Building (GAB) 220  
1155 Union Circle #305189  
Denton, TX 76203

Phone: 940-565-2051

Website: <http://cas.unt.edu/advising/health-professions>

## Preparing for the MCAT?

Visit [www.aamc.org/mcat](http://www.aamc.org/mcat) for information about the test

### Exam Preparation Materials:

ExamCrackers

Kaplan

Princeton Review

The MCAT will also cover Introduction to Sociology (SOCI 1510)  
and General Psychology (PSYC 1630 & 1650)

## Get Involved!

Alpha Epsilon Delta

Pre-Health Minority Club  
(Alpha Delta)

Medically Dedicated Students

UNT's Volunteer Organizations

American Medical Association

Texas Medical Association

American Association of  
Medical Colleges

# 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 TMDAS, AMCAS, and/or AACOMAS. Interviews with medical schools are typically July through December.

FALL _____	Hrs.

SPRING _____	Hrs.

**Fall Timeline**

- Medical School Interviews

**Spring Timeline**

- January—Match Date
- February—Informed by Medical Schools if accepted

# P R E R E Q U I S I T E S

## General Prerequisite Coursework for Texas Medical Schools

A 'C' or better is required in all coursework

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 3451/3452

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) Elementary 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 1700 (3hrs) Intro to Technical Writing

ENGL 1320 (3hrs) College Writing II or 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.

## Additional Information by School

### UT Southwestern

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

Recommended for BIOL elective:  
BIOL 3451/3452, BIOL 4201/4202,  
BIOL 4055/4056, BIOL 2301/2311,  
BIOL 2302/2312, BIOL 4290

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

Math: 1 semester of Calculus OR Statistics

Only requires 4 hrs of General Chemistry

### UTHSC-Houston (McGovern)

Recommended for BIOL elective:  
BIOL 3451/3452, BIOL 4201/4202,  
BIOL 2301/2311, BIOL 2302/2312

Biochemistry accepted towards 14hrs of BIOL (not required)

Only one year of Biology can be completed by AP credit

No Math course is required

### UTHSC-San Antonio

Biochemistry course may be used towards the Biology or Chemistry requirements

### TAMU Health Science Center

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

### Texas College of Osteopathic Medicine (UNT)

1 semester of Biochemistry is not required BUT accepted towards the Biology requirement

Recommended for BIOL elective:  
BIOL 3451/3452, BIOL 4201/4202,  
BIOL 2301/2311, BIOL 2302/2312,  
BIOL 4290

### 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

### 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 4201/4202, BIOL 3451/3452

### UIW School of Osteopathic Medicine

Biochemistry is not required

Only requires 8 hours of Biology (more is encouraged)

6 hours of Philosophy or related Humanities coursework is recommended

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

### Paul L. Foster

2017 Entering Class: Biochemistry is required, and can help satisfy either the biology or chemistry requirements

2017 Entering Class: Statistics is required (will no longer accept Calculus)

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

Biostatistics and Cellular/Molecular Biology is recommended

### 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

### University of Texas Rio Grande Valley

Biochemistry course may be used towards the Biology or Chemistry requirements

### Baylor College of Medicine

Requirements include:

3-4 hours of Math (Calculus, Stats, or Physics)

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)

Recommended: Spanish

\*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.\*



# Webpages and Resources

## Texas Medical Schools

University of Texas Southwestern Medical Center

<http://www.utsouthwestern.edu/>

University of Texas Health Science Center—Houston Medical School

<https://www.uth.edu/>

University of Texas Health Science Center—San Antonio Medical School

<http://www.uthscsa.edu/>

Texas A&M University Health Science Center

<http://tamhsc.edu/>

University of North Texas Health Science Center

<http://web.unthsc.edu/>

Paul L. Foster School of Medicine

<http://el Paso.ttuhsc.edu/fostersom/>

University of Texas Medical Branch —Galveston

<http://www.utmb.edu/>

Texas Tech University Health Sciences Center

<http://www.ttuhsc.edu/>

Baylor College of Medicine

<https://www.bcm.edu/>

Dell Medical School (admitting 2016)

<http://www.utexas.edu/dell-medical-school>

UT Rio Grande Valley (admitting 2016)

<http://www.utrgv.edu/en-us/utrgv-medical-school/>

UIW School of Osteopathic Medicine

<http://www.uiw.edu/som/index.html>

## Student and Professional Associations

Alpha Epsilon Delta

<http://aedunt.wix.com/texastheta>

Alpha Delta: Pre-Health Minority Club

<https://orgsync.com/9926/chapter>

Medically Dedicated Students

<https://orgsync.com/10711/chapter>

UNT's Volunteer Organizations

<http://studentaffairs.unt.edu/>

American Medical Association

<http://www.ama-assn.org/ama>

Texas Medical Association

<http://www.texmed.org/>

American Association of Medical Colleges

<https://www.aamc.org/>

## Contact Us

To schedule an advising appointment, please contact our front desk at 940-565-2051. Have a quick question? Feel free to send us an e-mail using the addresses listed on the front page.

The best way to achieve your academic and career goals is to ask for help! We are committed to providing you the best service possible, so we look forward to seeing you in the near future!

## MCAT Information and Preparation

About the MCAT

<https://www.aamc.org/students/applying/mcat/>

MCAT Prep Materials

<http://www.examcrackers.com/>

<http://www.kaptest.com/>

<http://www.princetonreview.com/>

## Experience and Additional Resources

Physician Scribing

<http://www.scribeology.com/>

<http://scribeinnovations.com/>

<http://www.docassistscribe.com/>

Career Exploration

<https://www.aamc.org/students/aspiring/>

<http://texashotjobs.mobi/>

<http://explorehealthcareers.org/en/home>

## **Biomedical Engineering at UNT introduces a new 'Business Track' starting Fall 21**

The ABET-accredited Department of Biomedical Engineering at UNT is introducing a new 'Business Track' to its undergraduate curriculum, starting Fall 2021. Students opting for this track can choose four approved electives from G. Brint Ryan College of Business at UNT. Students have the option of getting a business minor by choosing two more approved electives.

With the addition of the business track, Biomedical Engineering now offers 7 tracks for its undergraduate students.

Please contact the department for more details.

## BACHELOR OF SCIENCE DEGREE IN BIOMEDICAL ENGINEERING

Business Track

120 SCH

2021-22

### Example Course of Study

#### Freshman Year

	<u>Fall</u>		<u>Spring</u>	
	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
		<u>17</u>		

#### Sophomore Year

	<u>Fall</u>		<u>Spring</u>	
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	<u>3</u>
PSCI 2305	American Government	3		
		16		15

#### Junior Year

	<u>Fall</u>		<u>Spring</u>	
MATH 2730	Multivariate calculus	3	BMEN 3312 Introduction to Biomechanics	<u>3</u>
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

	<u>Fall</u>		<u>Spring</u>	
BMEN 4310	Biomedical Modeling	3		
BMEN XXXX	Advanced Topic in BMEN	3	BMEN XXXX Advanced Topic in BMEN	3
BMEN 4212	Senior Design I	<u>1</u>	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

## UNDERGRADUATE MINORS



# Computer Science and Engineering minor

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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

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- [CSCE 1030 - Computer Science I](#)
- [CSCE 1040 - Computer Science II](#)
- [CSCE 2100 - Computing Foundations I](#)
- [CSCE 2110 - Computing Foundations II](#)

# Electrical Engineering minor

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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

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[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

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

## Required

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- [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

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- [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

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

# Mechanical Engineering minor

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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

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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

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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

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- [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

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- 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

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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

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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

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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

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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*

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

# Management minor

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

## Organizational behavior, 3 hours

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MGMT 3720 - Organizational Behavior

### Plus 15 hours from

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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

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A minor in marketing requires 18 hours.

## Required course, 3 hours

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MKTG 3650 - Foundations of Marketing Practice

## Plus 15 hours from

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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

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Requires 18 hours (6 courses, as follows):

## Required courses

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MGMT 3820 - Management Concepts

MGMT 3850 - Foundations of Entrepreneurship

Plus four courses from

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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

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