

# BS IN BIOMEDICAL ENGINEERING DEGREE IN THREE ACADEMIC MAP

2021-2022 CATALOG YEAR

This is an unofficial simplified checklist effective fall 2017. Degree requirements may change. You may need elective courses to help reach a minimum of 120 Total Hours & 36 Advanced Hours. Check with an advisor.

Must earn at least a grade of “C” in each course above except for most University Core courses.

## BIOMEDICAL ENGINEERING

(Bachelor of Science (B.S.) degree with a major in Biomedical Engineering)

<p>Biomedical Engineering Department Discovery Park B-131; (940) 565-3338 Faculty Advisor: Dr. Vijay Vaidyanathan <a href="mailto:vijay.vaidyanathan@unt.edu">vijay.vaidyanathan@unt.edu</a></p>	<p>Engineering Advising Office Discovery Park A-101; (940) 565-4201 Academic Advisor: TBD by Track Selection</p>
<p><b>University Core</b></p>	<p><b>Major Requirements</b> (Grades with a C or better)</p>
<p><u>COMMUNICATION</u></p> <ul style="list-style-type: none"> <li>▪ 1 Course (3 Hours)</li> <li>▪ Grade of “C” or better is required</li> </ul> <p><u>AMERICAN HISTORY I</u></p> <ul style="list-style-type: none"> <li>▪ 1 Course (3 Hours)</li> </ul> <p><u>AMERICAN HISTORY II</u></p> <ul style="list-style-type: none"> <li>▪ 1 Course (3 Hours)</li> </ul> <p><u>FEDERAL GOVERNMENT/POLITICAL SCIENCE</u></p> <ul style="list-style-type: none"> <li>▪ 1 Course (3 Hours)</li> </ul> <p><u>STATE GOVERNMENT/POLITICAL SCIENCE</u></p> <ul style="list-style-type: none"> <li>▪ 1 Course (3 Hours)</li> </ul>	<p><u>BIOMEDICAL ENGINEERING</u></p> <ul style="list-style-type: none"> <li>▪ BMEN 1300, Discover Biomedical Engineering (3 Hours)</li> <li>▪ BMEN 1400, Software for Biomedical Engineers (4 Hours)</li> <li>▪ BMEN 2210, DAQ Practices (3 Hours)</li> <li>▪ 3 Hours)</li> <li>▪ BMEN 2320, Biomedical Instrumentation I (3 Hours)</li> <li>▪ BMEN 3310, Engr. Measurements from Human Systems (3 Hours)</li> <li>▪ BMEN 3311, Biomedical Signal Analysis (3 Hours)</li> <li>▪ BMEN 3312, Introduction to Biomechanics (3 Hours)</li> </ul>

CREATIVE ARTS

- 1 Course (3 Hours)

LANGUAGE, PHILOSOPHY, & CULTURE

- 1 Course (3 Hours)

SOCIAL & BEHAVIORAL SCIENCES

- 1 Course (3 Hours)

**Major Requirements (Grades of C or better)**

TECHNICAL COMMUNICATIONS

- TECM 2700, Technical Writing (3 Hours)

MATHEMATICS

- MATH 1710, Calculus I (4 Hours)
- MATH 1720, Calculus II (3 Hours)
- MATH 2700, Linear Algebra (3 Hours)
- MATH 2730, Multivariable Calculus (3 Hours), or MATH 3350, Numerical Analysis (3 Hours)
- MATH 3410, Differential Equations (3 Hours)
- MATH 3680, Applied Statistics (3 Hours)

**(Completion of the above courses will earn a Mathematics minor.)**

SCIENCES

- BIOL 2301, Human Anatomy & Physiology (3 Hours)& BIOL 2311, Human Anatomy & Physiology Lab (1 Hour)  
CHEM 1410, General Chemistry I (3 Hours) & CHEM 1430, General Chemistry I Lab (1 Hour), or CHEM 1415, Chemistry for Engineers (3 Hours) & CHEM 1435, Chemistry for Engineers Lab (1 Hour)
- PHYS 1710, Mechanics (3 Hours) & PHYS 1730, Mechanics Lab (1 Hour)

- BMEN 3321, Biomaterials (3 Hours)
- BMEN 3350, Biomedical Transport Phenomena (3 Hours)
- BMEN 4310, Biomedical Modeling (3 Hours)
- BMEN 4212, Senior Design I (1 Hours)
- BMEN 4222, Senior Design II (3 Hours)
- BMEN 4\*\*\*, Advanced Elective (3 Hours)
- BMEN 4\*\*\*, Advanced Elective (3 Hours)
- BMEN 4\*\*\*, Advanced Elective (3 Hours)

**BIOMEDICAL ENGINEERING ELECTIVE TRACK**

Choose an elective track & complete a minimum of 6 courses (18 Hours) from the approved options below:

- |                |                |
|----------------|----------------|
| Track Elective | Track Elective |
| Track Elective | Track Elective |
| Track Elective | Track Elective |

Biomedical Instrumentation Elective Track:

- EENG 2610, 2611, 2620, 2621, 2710, 2711, 3510, & 4\*\*\* level course.

**(Completion of this track will earn an Electrical Engineering minor.)**

Biomechanics Elective Track:

- MEEN 2301, 2302, 2210, 2332, & two MEEN 3\*\*\* and/or 4\*\*\* level courses. See advisor for specific course choices.
- Course approved by an advisor (3 Hours)
- Course approved by an advisor (3 Hours)

**(Completion of an additional MEEN 3\*\*\* and/or 4\*\*\* level specific course in addition to this track will earn a Mechanical & Energy Engineering minor.)**

Biocomputing Elective Track:

- CSCE 1030, 1040, 2100, 2110, & two CSCE 3\*\*\* and/or 4\*\*\* level courses

(Completion of this track will earn a Computer Science & Engineering minor.)

Pre-Medical Elective Track:

- BIOL 1710, 1720, 1760, 2041, 2042, 3451, 3452, 4580, 4770, BIOC 3621, 3622

(Completion of this track will earn a Biological Sciences minor).

Additional courses are required for admissions into medical school.

### Year 1 at UNT

FALL	Hrs.
BIOL 2301	3
BIOL 2311	1
BMEN 1300	3
BMEN 2210	3
MATH 2700	3
<i>Total Hours</i>	<i>13</i>

SPRING	Hrs.
BMEN 1400 (MATH 1650 or higher)	4
BMEN 2320 (see note 1)	3
MATH 3410	3
Elective Track Course (see note 5)	3
<i>Total Hours</i>	<i>13</i>

### Year 2 at UNT

FALL	Hrs.
MATH 2730 or MATH 3350 (see note 2)	3
BMEN 3310 (see note 3)	3
BMEN 3311	3
BMEN 3350 (see note 4)	3
Elective Track course (see note 5)	3
<i>Total Hours</i>	<i>15</i>

SPRING	Hrs.
MATH 3680	3
BMEN 3312	3
BMEN 3321	3
Elective Track course (see note 5)	3
<i>Total Hours</i>	<i>12</i>

## Year 3 at UNT

FALL	Hrs.
BMEN 4310	3
BMEN 4212	1
BMEN 4***	3
Elective Track course (see note 5)	3
Elective Track course (see note 5)	3
<i>Total Hours</i>	<i>13</i>

SPRING	Hrs.
BMEN 4222,	3
BMEN 4***	3
BMEN 4***	3
Elective Track course (see note 5)	3
<i>Total Hours</i>	<i>12</i>

**Required prerequisite (s) indicated in parentheses**

Notes:

Note 1: BMEN 2320 requires completion of BMEN 1300, BMEN 2210, BMEN 1400 or concurrent enrollment in BMEN 1400.

Note 2: MATH 2730 requires completion of MATH 1720. MATH 3350 requires completion of MATH 2700 and Programming.

Note 3: BMEN 3310 requires completion of BMEN 1300, BMEN 2320, BIOL 2301, and BIOL 2311.

Note 4: BMEN 3350 requires completion of BMEN 1300, MATH 3410, PHYS 1710, and CHEM reqt.

Note 5: Elective Track Courses depend on your chosen BMEN track. See BMEN curriculum page for options. Some track courses are offered fall only or spring only. Must meet prerequisite for track courses.

**Must earn at least a grade of "C" & a minimum 2.5 GPA in Communications Core, TECM 2700, BMEN 1300, BMEN 1400, BMEN 2210, BMEN 2320, MATH 1710, MATH 1720, PHYS 1710, PHYS 1730, BIOL 2301, BIOL 2311, CHEM 1410, CHEM 1430 or CHEM 1415, 1435 as foundations to enroll in advanced courses.**

<p><i>Credits Which Could Be Earned Prior to Enrollment at UNT –AP, IB, CLEP, DC, Transfer:</i></p> <p>Communications Core TECM 2700 CHEM 1410, 1430 PHYS 1710, 1730 HIST 2610 HIST 2620 PSCI 2305 PSCI 2306 Creative Arts Core Language Philosophy Culture Core Social Behavioral Sciences Core</p>	<p><i>Credits Which Should Be Earned Prior to Enrollment at UNT –AP, IB, CLEP, DC, Transfer:</i></p> <p>MATH 1710 MATH 1720</p>
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**This is an unofficial sample schedule. Requirements, prerequisites, etc. may change. Students should meet with an advisor each semester for individual scheduling, program decisions, etc. Engineering admissions requirements must be met & a degree audit must be created in order to progress in the program to a timely graduation.**