MS in Biomedical Engineering

The M.S. program in Biomedical Engineering is offered by UND and North Dakota State University (NDSU). The program is offered jointly by UND's College of Engineering and Mines, School of Medicine and Health Sciences, and NDSU's College of Engineering.

Every M.S. student will be associated with at least one of the following Biomedical Research Groups (BRGs):

- Biomechanics
- Biomaterials
- Bio-instrumentation
- Multi-scale, bio-system simulation and modeling
- Bio-Signals
- Other emerging areas as identified

The student's graduate committee must consist of at least one faculty member from NDSU.

Program Requirements

This program prepares students who have a strong interest in research-oriented engineering related to the medical device field. All of the general requirements for enrollment, participation, and completion of a degree documented in the UND Academic Catalog as appropriate shall be required.

The M.S. degree will be offered with two options: 1) thesis-based; and 2) non-thesis-based. Specific requirements over and above the general catalog requirements for both thesis-based and non-thesis-based options are listed below.

Admission Requirements

1. Bachelor of Science degree from an ABET-accredited engineering program; or
2. Students holding a B.S. degree in other disciplines may be admitted to Qualified Status with an obligation to acquire the necessary background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis
3. Minimum GPA of 3.0 (4.0 scale) is required. Conditional admittance may be obtained for GPAs less than 3.0.

Degree Requirements – Thesis-based (total 30 credits)

Code	Title	Credits
Required:		
Anatomy-Physiology (3-6 credits):		
EE 590	(Physiology and Anatomy for Biomedical Engineers)	6
or		
BIOL 660	(NDSU - Animal Physiology)	3
Seminar - 3 credits (1 per semester) taken from the following:		
EE 570		1
ENGR 562	Seminar in Engineering	1
ENGR 790	(NDSU - Seminar)	1
Classes related to BRG (2-3 classes)		6-9
Thesis		9
Electives:		
Internship (industrial, clinical, or research lab)		0-3
Graduate Preparation, e.g., Grant Writing		0-3
Elective courses approved by advisor		1-9

Degree Requirements – Non Thesis-based (total 30 credits)

Code	Title	Credits
Required:		
Anatomy-Physiology (3-6 credits from the following):		
EE 590	(Anatomy & Physicology for the Biomedical Engineer)	6
or		
BIOL 660	(NDSU - Animal Physiology)	3
Seminar (3 credits, 1 per semester) Seminar class can be taken from the following:		3
ENGR 562	Seminar in Engineering	1
EE 570		1
ENGR 790	(NDSU - Seminar)	1
Classes related to BRG (2-3 classes)		6-9
Project		3
Electives:		**3**
Internship (industrial, clinical or research lab)		0-3
Graduate Preparation, e.g., Grant Writing		0-3
Electives approved by advisor		1-15

Admission Requirements - Accelerated Bachelor's/Master's (ABM) 5-year Degree

The Accelerated bachelor's in biomedical engineering degree program allows exceptional high school students and undergraduate students within the UND College of Engineering and Mines an opportunity to complete the requirements for both the bachelor's and master's degrees at an accelerated pace. High achieving high school students (GPA of at least 3.2/4.0) will initially be considered for "identified" status and become eligible for formal admission when they meet the same criteria that undergraduates must meet for admission. Admission is a competitive process and meeting the following minimum eligibility requirements doesn't guarantee admission.

1. Applicants must meet the School of Graduate Studies' current minimum general admission requirements for the Accelerated Bachelor's/Master's (ABM) 5-Year Degree Program as published in the graduate catalog.
2. A minimum cumulative Grade Point Average (GPA) of at least 3.2 (based on A= 4.00) for all undergraduate work.

ABM 5-Year Degree Program Admission

The ABM degree program allows exceptional undergraduate students at UND an opportunity to complete the requirements for both the bachelor's and master's degrees at an accelerated pace. All requirements for both degrees must be met, and these students may double count up to 12 graduate-level credits towards the requirements for both Masters in Biomedical Engineering non-thesis and thesis based. ABM students can obtain their Master of Biomedical Engineering degree within 12 months of completing their College of Engineering and Mines Bachelor's degree, provided that the degree requirements can be completed in that timeframe.

High achieving high school students (GPA of at least 3.2/4.0) will initially be considered for "identified" status and become eligible for formal admission when they meet the same criteria that undergraduates must meet for admission into the ABM program. Admission is a competitive process. The following are minimum eligibility requirements:

1. Students must meet the School of Graduate Studies admissions eligibility requirements.
2. Students must have completed a minimum of 60 credits, including credits earned from advanced placement and dual credit. Students must apply before completion of the undergraduate degree.
3. Transfer students with a minimum of 60 credits-whether from the transfer institution alone or in combination with UND credits-must have a minimum cumulative GPA of 3.2/4.0 at the time of admission to the ABM program.
4. Students must have a minimum cumulative GPA of 3.2/4.0 at UND at the time of admission into the ABM program.
5. ABM program applicants must submit the standard application to the School of Graduate Studies, the application fee, a personal statement, and

transcripts. ABM program applicants do not need to take the GRE or other standardized exams.

Additionally, ABM program applicants must submit a detailed Program of Study that describes the 12 credits of double-counted courses, the courses that will be taken after being accepted into the Master of Biomedical Engineering program and before the end of their Bachelor degree and also the expected graduation date for each degree. The submitted program of study must be signed by the student, the student's undergraduate advisor, the student's graduate advisor, and the biomedical engineering program director.

Requirements for Completion of the ABM Degree Program:

- Students must complete their bachelor's degree prior to entering the master's program. Student in the ABM may not elect to bypass the bachelor's degree.
- Student must maintain a cumulative GPA of 3.0/4.0 or better in the double counted graduate level courses.
- No more than twelve (12) credits of graduate work may be counted toward the requirements of both degrees.
- A student who is ineligible to participate in (or withdraws from) the CBM program, cannot double count any courses. The courses that were identified as double counted will remain on the undergraduate transcript only.
- At least one peer-reviewed conference, journal, or patent application submitted with the consent of the student's advisor.
- Non-thesis track students are not required to submit for publication.

Combined MS Biomedical Engineering

Admission Requirements – Combined Bachelor's/Master's (CBM) Program

The Combined Bachelor's/Master's (CBM) program in Biomedical Engineering allows undergraduate students earning a degree within the UND College of Engineering and Mines an opportunity to complete the requirements for both the bachelor's and master's degrees at an accelerated pace. These students may double count up to 6 graduate-level credits for both degrees. This applies to both Master of biomedical engineering with and without thesis.

Admission to a CBM program: Student eligibility requirements

- Students meet all graduate admissions eligibility requirements. Students will not be required to prove English Language Proficiency a second time.
- Students must have completed a minimum of 60 credits, including credits earned from advanced placement and dual credit. Students must apply before the completion of the undergraduate degree.
- Students must have a minimum cumulative grade point average (GPA) of 3.0/4.0 at UND at the time of admission to the program.

Combined Bachelor's/Master's Application:

- Student must submit the standard application for admission to the School of Graduate Studies, including an application, application fee, personal statement, and transcripts. Individual departments may choose to require GRE scores or other information.
- A Program of Study, signed by the applicant, the advisor, and the Director of the Graduate Program in Biomedical Engineering must be submitted.
- The Program of Study must clearly indicate:
  - The courses (a maximum of 6 graduate credits) that will be double counted for both bachelor's and master's degrees. These courses will be taken prior to completing the bachelor's degree.
  - The courses that will be taken after being accepted into the graduate program. These courses will be taken after completing the bachelor's degree.
- After review of the materials submitted by the Director of the Biomedical Engineering Program to the School of Graduate Studies, a letter of acceptance (or denial) to the master's program, contingent upon meeting the CBM requirements, is issued.
- Applications accepted for admission to the Graduate Program will not be matriculated until completion of the bachelor's degree.

Requirements for Completion of the Combined Bachelor's/Master's Degree Program:

- Students must complete their bachelor's degree prior to entering the master's program. Student in the CBM may not elect to bypass the bachelor's degree.
- Student must maintain a cumulative GPA of 3.0/4.0 or better in the double counted graduate level courses.
- No more than six (6) credits of graduate work may be counted toward the requirements of both degrees.
- A student who is ineligible to participate in (or withdraws from) the CBM program, cannot double count any courses. The courses that were identified as double counted will remain on the undergraduate transcript only.
- At least one peer-reviewed conference, journal, or patent application submitted with the consent of the student's advisor.
- Non-thesis track students are not required to submit for publication.