Master of Science in Systems Engineering

This program prepares students who have a strong interest related to the Systems Engineering field. All of the general requirements for enrollment, participation, and completion of a degree documented in the catalog of the University of North Dakota as appropriate shall be required. Specific requirements over and above the general catalog requirements are as follows:

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, and/or
3. Graduate Record Examination General Test for applicants from non-ABET accredited programs, and
4. Minimum G.P.A. is 3.0 (4.0 scale) is required. Conditional admittance may be obtained for G.P.A.s less than 3.0.

Combined Bachelor/Master's Program Admission Requirements

The intent of the combined BS/MS Systems Engineering program is to allow qualified students to complete the requirements for both degrees in one year beyond that required to receive the engineering baccalaureate degree. All requirements for both degrees must be met, and up to six credits of prior-approved graduate environmental engineering coursework, preferably at the 500-level, may be double-counted toward each of the two degrees.

UND students currently completing their junior year (90 credits) towards an undergraduate engineering degree may apply to the MS Systems Engineering under combined admission. The following are minimum eligibility requirements:

1. Students must have completed a minimum of 90 credits, including credits earned from advanced placement and dual credit. Students must apply before completion of the undergraduate degree.
2. Transfer students with a minimum of 90 credits-whether from the transfer institution alone or in combination with UND credits-must have both an overall grade point average of 3.00 (based on a 4.00 scale) and 3.00 GPA average for all courses with an engineering prefix completed at the date of application and admission.
3. Students must have a both an overall grade point average of 3.00 (based on a 4.00 scale) and 3.00 GPA average for all courses with an engineering prefix completed at the date of application and admission.
4. Combined program applicants must submit the standard application to the School of Graduate Studies, the application fee, a personal statement, and transcripts.
5. Additionally, combined program applicants must submit a detailed Program of Study that describes the 6 credits of double counted courses, the courses that will be taken after being accepted into the combined program, the courses that will be taken before graduation from the Bachelor program, and 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 Graduate Program Director.

Degree requirements for the M.S. degree are those listed by the School of Graduate Studies as found in the graduate school catalog.

Accelerated Bachelor's/ Master's (ABM) 5-Year Program Admission Requirements

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 their Bachelor and the Master of Science in Systems Engineering degree requirements. ABM students must obtain their Master of Science degree in Systems Engineering within 12 months of completing the Bachelor degree, provided that the degree requirements can be completed in that timeframe.

High achieving high school students (GPA of at least 3.5/4.0 and an ACT score of 25 or higher) 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 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.
2. 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 3.5/4.0 at the time of admission to the ABM program.
3. Students must have a minimum cumulative GPA of 3.5/4.0 at UND at the time of admission into the ABM program.
4. ABM program applicants must submit the standard application to the School of Graduate Studies, the application fee, a personal statement, and transcripts.
5. 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 ABM program, the courses that will be taken before graduation from the Bachelor program, and 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 Graduate Program Director.

Degree requirements for the M.S degree are those listed by the School of Graduate Studies as found in the graduate school catalog.

Degree Requirements (30 Credits)

1. Required Core (15 credits):

Code	Title	Credits
ENGR 550	Fundamentals of Systems Engineering (Fundamentals of Systems Engineering)	3
ENGR 554	Applied Project Management	3
ENGR 556	System Dynamics I	3
ENGR 998	Thesis	6

2. Core Electives (6 credits - choose from)

Code	Title	Credits
ENGR 558	System Dynamics II	3
CHE 515	Design of Engineering Experiments	3
MGMT 501	Quantitative Analysis for Management Decisions	3
MGMT 505	Organization Leadership and Ethics	2
MGMT 575	Special Topics (Ethics in Engineering)	3

3. Specialization Track (9 credits - choose one track)

Unmanned Aircraft Systems

Code	Title	Credits
ME 530	UAS in Engineering Design and Applications	3
ME 580	Introduction to Autonomous Robotics	3
EE 504	Power Electronics	3
EE 752	Introduction to Autonomous Systems	3
GEOG 474	Introduction to Geographic Information Systems (GIS)	2
GEOG 474L	GIS Laboratory	1

ME 439	Introduction to Robotics	3
ME 566	Introduction to Machine Vision	3

Energy Systems

Code	Title	Credits
ENE 510	Energy Systems Engineering I (Required)	3
EE 502	Power Systems I	3
EE 507	Renewable Energy Systems	3
EE 582	Intelligent Decision Systems	3
EE 583	Engineering Systems Reliability	3
EE 670	Analytical Foundations of Cyber Security	3
CHE 503	Fuels Technology	3-4
ESSP 503	Environmental Policy Science	3
ESSP 505	Energy Issues and Earth Systems	3
ESSP 507	Earth Systems Processes and Vulnerability Analysis	3
ESSP 520	Earth Systems Modeling	3
ESSP 540	Advanced Topics in Geospatial Technologies	3
ESSP 562	Environmental Economics, Policy and Management	3

Aerospace Systems

Code	Title	Credits
ME 466	Aerodynamics	3
ME 574	Advanced Heat Transfer	3
EE 541	Communications Engineering	3
SPST 505	Spacecraft Systems Engineering	3
SPST 500	Introduction to Orbital Mechanics	3
SPST 506	Advanced Orbital Mechanics	3
SPST 570	Advanced Topics in Space Studies (Aerospace Propulsion Systems or Aerospace Environment)	3
SPST 517	Human Spaceflight Systems	3
SPST 405	Space Mission Design	3

Regulatory Systems

Code	Title	Credits
BME 671	Medical Device Regulatory and Commercialization	3
BME 672	Quality Engineering	3
BME 673	Risk Management	3
BME 674	Good Manufacturing Practice	3
BME 675	Medical Device Commercialization	3
BME 676	Product Safety	3
BME 677	FDA Regulatory Approval Pathways	3
BME 678	Verification Validation	3
BME 690	Special Topics in Biomedical Engineering	3-9

Biomedical Systems

Code	Title	Credits
BME 631	Anatomy and Physiology for Biomedical Engineers I (Required)	4
BME 632	Anatomy and Physiology for Biomedical Engineers II	4
BME 650	Medical IoT Innovation I: Biomedical Instrumentation	3
BME 651	Medical IoT Innovation II: Digital Data Use	3
BME 621	Software for Biomedical Engineering	3
BME 622	Introduction to NeuroEngineering	3
BME 624	Computational neuroengineering of innovation	3
BME 625	Biomedical Applications of RF/Microwaves	3
BME 644	Advanced Imaging Systems in Biomedicine	3
BME 690	Special Topics in Biomedical Engineering	1-9