

The University Senate of Michigan Technological University
Proposal 37-20
(Voting Units: Academic)

“Proposal to Change the Name of the Bachelor of Science in Surveying Engineering to Bachelor of Science in Geospatial Engineering”

1. Date: January 10, 2020
2. Proposer Contact Information: Audra Morse, Department of Civil and Environmental Engineering
3. General Description of Program:
 - a. General Description

The Department of Civil and Environmental Engineering proposes to change the name of the existing four-year degree “Bachelor of Science in Surveying Engineering” to “Bachelor of Science in Geospatial Engineering”. This proposal is supported by industry needs, well-reasoned rationale, departmental support and the full support of the Surveying Engineering Industry Advisory Board.

b. Learning Goals

The Bachelor of Science in Surveying Engineering is ABET Accredited and has adopted the Engineering Accreditation Commission Student Outcomes as program the Student Learning Goals. The Student Outcomes, statements of which the students should attain by the time of graduation are as follows (<https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2019-2020/#GC3>):

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
 2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
 3. an ability to communicate effectively with a range of audiences
 4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
 5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
4. Rationale:

a. Meeting Industry Needs

The Surveying profession has evolved over the last several decades to meet the needs of industry and provide the expanding need for geospatially related data. New and emerging technologies must be embraced and integrated into our existing program to keep current and competitive. The brand that is marketed to our potential students must also stay current and relevant to the industry we serve.

b. Evolution of the Profession

The public often associates land surveying with people in red vests working along the roads. While this is still a part of the profession (construction and engineering surveying), the advances in technology and computing sciences have drastically changed the profession. Satellite imaging, aerial LiDAR, terrestrial laser scanning, high precision GPS positioning, radar and acoustic data acquisition technologies have changed the core of the profession from purely field data collection to complicated data analysis, data engineering, and data management. Massive quantities of high-definition data are acquired, processed, distributed, and managed using the cutting-edge computing and networking technologies. A quick query on any job search engine outputs required qualifications like “spatial analyst”, “spatial data manager”, “image analyst”, “spatial engineer”, etc. The surveying profession has changed, so the name should as well. In 1981 Michel Paradis, a French-Canadian surveyor introduced Geomatics as a new scientific term, and some programs began to rebrand using the new terminology. The downside to this change was a disconnection with the public’s recognition of the term Surveying with no recognition of the relationship to the evolution of the discipline. This name recognition problem continues today and requires continual explanation of what the program represents to potential students.

c. Name Recognition

The new name of the program should explicitly identify the core of profession, be linguistically clear and comprehensible. In addition, the program’s name should indicate the level of expertise and type of activities required from the graduates. “Geo” links to the Earth; “Spatial” highlights 3D measurements (in contrast to “geography”, earth description). “Engineering” outlines the complexity, analysis and experimentation involved by the professionals working in this discipline. The proposed name “Geospatial Engineering” in short, is self-explanatory, and attractive. The “Engineering” word in the name also indicates the historical roots and relation of surveying to Civil Engineering. A recent poll was conducted of students in a similar program during AY 2017/2018 that inquired if they would be attracted to the program name “Geospatial Engineering”. The students overwhelmingly supported the new name as well as have self-identified as such.

Many prospective students have little understanding of the profession based on the name and this makes outreach and recruitment difficult. By changing to Geospatial Engineering, we give prospective students a better idea of the degree and profession. The term “Engineering” conveys an applied scientific and mathematical rigor common to all engineering programs while “Geospatial” is now widely used and better understood. The department and program faculty are eager to begin a rebranding campaign that we can roll out in conjunction with our increased recruitment efforts that we anticipate will positively affect enrollment.

- d. *The benefits of a new name*
 - i. *Clarity*
 - ii. *Better reflection of the profession*
 - iii. *Attractiveness to potential students*
 - iv. *Alignment with DoD funded degrees (i.e., USAF)*

5. Discussion of Related Programs Within the Institution and Other Institutions
 - a. Within Michigan Tech

In the Bachelor of Science of Engineering, provided by the Engineering Fundamentals Department, a Geospatial Track existed. Collaboratively, faculty from Engineering Fundamentals, Amy Monte and Jon Sticklen, and the faculty of the Surveying Engineering program, Joe Foster, Jeffery Hollingsworth and Eugene Levin, aligned the Surveying Engineering program to adopt the Engineering Fundamentals first year curriculum and adopted other College of Engineering courses. These changes have made the EF BSE-Geospatial Track and the proposed Bachelor of Science in Geospatial Engineering effectively equivalent. As such, EF will be removing this option the BSE Geospatial Track option effective upon program name approval.

- b. Other Institutions

The National Society of Professional Surveyors (NSPS) lists the following ABET accredited program names associated with the discipline "Surveying". Program key words to search for are: Land Surveying, Surveying and Mapping, Geomatics, Surveying Engineering Technology, **Geospatial Engineering**, Geomatics Engineering, Surveying Engineering, Land Surveying and Mapping, Geographic Information Science and Surveying Technology.

A quick search using Google reveals that programs exist using the name "Geospatial Engineering" yields a multitude of programs that contain in part the word "Engineering" included in the names. Variants include Surveying Engineering, Geomatics Engineering, Geographic Information Science, and Geospatial Engineering. Some examples of the programs using Geospatial Engineering include:

- [Geospatial Engineering at Virginia Tech](#)
- [Geospatial Engineering Cal Poly Pomona](#)
- [Geospatial Systems Engineering Texas A&M University - Corpus Christi](#)
- [Geospatial Science and Engineering at UNSW in Sydney, Australia](#)
- [Geospatial Engineer US Army \(previously Surveyor\).](#)
- [Geospatial Information Science and Engineering SUNY, New York](#)
- [MSc Geospatial Engineering University of Nottingham Ningbo China \(UNNC\)](#)

6. Curriculum Design

No revisions to the curriculum are proposed.

7. New Course Descriptions

No new courses are proposed.

8. Additional Resources Required:

No additional resources are necessary to facilitate the name change or to offer any new courses.

9. Accreditation Requirements

ABET will perceive the change of the program as a substantive change. As such, the program must notify ABET in writing of the program name change. ABET will require copies of transcripts with the new name change to verify the name change is reflected consistently on student transcripts. The program will work with Associate Dean Bohmann to submit documentation to ABET.

10. Planned Implementation Date: Fall 2021.

Approved by: College of Engineering

Date: February 13, 2020

Approved by: Deans' Council

Date:

Approved by: University Senate

Date: