

MichiganTech

SCHOOL OF TECHNOLOGY ACADEMIC PROGRAM INFORMATION

Bachelor of Science in Surveying Engineering

Surveying Engineering graduates are hands-on problem solvers. They fill a critical need in business and industry as supervisors and managers who possess a combination of technical and managerial backgrounds. The ability of Tech graduates to contribute on the job from day one increases their value while providing them professionally rewarding careers with significant potential for advancement.

Undergraduate enrollment: 58

Faculty: 3

Average class size: 16

Average lab size: 12

Courses with labs: 10 of 14

Credit hours required: 130

Advisor: James C. Loman

Phone: (906) 487-2259

Fax: (906) 487-2583

Email: jcloman@mtu.edu

Website: <http://www.tech.mtu.edu>

Student/professional organizations:

- Douglass Houghton Student Chapter of the Michigan Society of Professional Surveyors
- Lambda Sigma Honor Society

Accreditation agency: Pending

Why get a degree in Surveying Engineering?

The Surveying Engineering program curriculum provides a unique blend of practical and theoretical knowledge that prepares students to create the future. Excellent support from the surveying profession ensures that our students gain exposure to state-of-the-art equipment and software as well as making numerous scholarships available. There are abundant opportunities for summer jobs in the public and private sectors throughout Michigan and the nation with many students securing their first job offer prior to their senior year. Students have numerous opportunities to increase their professional awareness and supplement their leadership skills through active participation in the Student Chapter of the Michigan Society of Professional Surveyors. Students may also get involved with faculty sponsored research or volunteer to help an upper-class person conduct his or her senior project.

What will I learn?

You will learn to use high-precision optical and electromechanical instruments and global positioning data from satellites to interpret information and formulate conclusions. The curriculum includes the use of Global Positioning System (GPS) techniques for high precision control surveys as well as other surveys wherever it's appropriate. Geographic Information Systems (GIS) technology is taught as part of the curriculum to collect, analyze, and interpret data for surveying and engineering applications. A sampling of course topics from the Surveying Engineering program follows:

- Oral and written communication
- Professional Ethics
- Physics (lab based)
- Math: Calculus, Statistics, Linear Algebra
- Computer Applications
- Engineering Problem Solving
- Accounting Principles and Business Law
- Contracts
- Environmental Geology
- Data Collection Techniques
- Professional Practice
- Surveying Fundamentals and Practice
- Survey Computations
- Survey Measurements and Adjustments
- Legal Aspects of Surveying
- Boundary Surveying
- Route and Construction Surveying
- Geodesy
- Geodetic Positioning
- Photogrammetry
- Land Subdivision Design
- Geographic Information Systems
- Surveying Field Practice

MichiganTech

Surveying Engineering

What is Surveying Engineering?

Surveying is the science of measuring the physical features of the earth using specialized equipment and procedures to obtain highly accurate results. Surveyors perform boundary and engineering-related surveys to prepare maps, plots, and plans depicting topography. They also verify the location of existing or planned surface or sub-surface features in relation to the existing survey control.

Who will I work for?

Opportunities for Surveying Engineering graduates have been excellent in positions across the U.S. Students are immediately valuable to prospective employers thus ensuring that you will obtain a professional, career-focused job upon graduation. Surveying Engineering program graduates are highly sought by both public and private sector organizations. While many have found work in the public sector or with utilities, most graduates find exciting careers in the private sector with small, medium or large engineering or surveying firms. Job opportunities for interns and graduates are available in surveying, cartography, photogrammetry, and as field engineers. Most states require professional licensure of surveyors. The requirements vary, but generally the completion of a rigorous examination and a three to eight year apprenticeship with a registered surveyor is necessary.

How much will I make?

New graduates can expect excellent starting salaries with almost 100% placement. Graduates report excellent earnings growth and careers that continually lead to more responsible leadership roles. Median annual earnings of surveyors were \$42,980 in May 2004. The middle 50 percent earned between \$31,940 and \$57,190. The lowest ten percent earned less than \$24,640 and the highest ten percent earned more than \$71,640. Median earnings of surveyors employed in architectural, engineering, and related services were \$41,710 in May 2004.

What preparation do I need in high school?

In preparation for a degree in engineering, the high school student should take chemistry, physics, at least three years of math, and as much English and communications as possible. In addition, practical, hands-on courses and at least one year of hands-on computer experience is strongly recommended.

Average ACT: Composite 25.1; English 23.7; Math 26.2

Average high school GPA: 3.5

Department of Labor Job Outlook

As technologies become more complex, opportunities will be best for surveyors who have a bachelor's degree and strong technical skills. Increasing demand for geographic data, as opposed to traditional surveying services, will mean better opportunities for cartographers and photogrammetrists who are involved in the development and use of geographic and land information systems. New technologies, such as GPS and GIS, also may enhance employment opportunities for surveyors who have the educational background and who have acquired technical skills that enable them to work with the new systems. At the same time, upgraded licensing requirements will continue to limit opportunities for professional advancement for those without a bachelor's degree.

Overall employment of surveyors is expected to grow about as fast as average for all occupations through the year 2014. The widespread availability and use of advanced technologies, such as GPS, GIS, and remote sensing, will continue to increase both the accuracy and productivity of these workers, limiting job growth to some extent. However, job openings will continue to arise from the need to replace workers who transfer to other occupations or who leave the labor force altogether. Many of the workers in these occupations are approaching retirement age.

Opportunities for surveyors should remain concentrated in architectural, engineering, and related services firms. Areas such as urban planning, emergency preparedness, and natural resource exploration and mapping also should provide employment growth, particularly with regard to producing maps for the management of emergencies and updating maps with the newly available technology. However, employment may fluctuate from year to year as a function of construction activity or with mapping needs for land and resource management.