

About Michigan Tech

Michigan Tech is located in Houghton, MI on the south shore of Lake Superior. This rural area is known for natural beauty, pleasant summers, abundant snow fall, and numerous all-season outdoor activities. In addition, the University maintains its own downhill and cross-country ski facilities and golf course. There are also numerous cultural activities and opportunities available on campus and in the community. Michigan Tech is rated as one of the safest college campuses in the United States, and the local community provides excellent resources conducive to quality family life.

About the Department of Civil and Environmental Engineering

The Civil and Environmental Engineering Department at Michigan Tech includes 26 faculty, who play an active role in graduate education and research, 30 professional staff, over 100 full-time graduate students, and more than 500 undergraduate students. Research funding exceeds \$4.5 million per year and several undergraduate and graduate degree programs are nationally ranked by U.S. News & World Report.

Michigan Technological University is an equal opportunity education institution/equal opportunity employer.

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1400 Townsend Drive
Houghton, MI 49931



Michigan Tech

Create the Future

Transportation

Change the World



Michigan Tech
Transportation Institute





How do we create a sustainable transportation infrastructure that supports a growing demand for a system that provides safe and efficient modes for moving goods and people, that positions us as a leader in a global economy, and reduces our dependency on diminishing natural resources?



PhD Civil Engineering
MS Civil Engineering
MEng Civil Engineering



Transportation Research Initiatives at Michigan Tech

The **Michigan Tech Transportation Institute (MTTI)** promotes transportation research and outreach activities, and provides connections between a variety of transportation centers and organizations in the Civil & Environmental Engineering Department at Michigan Tech. These centers and organizations offer unique expertise within the transportation industry. For more information, visit www.mtti.mtu.edu.

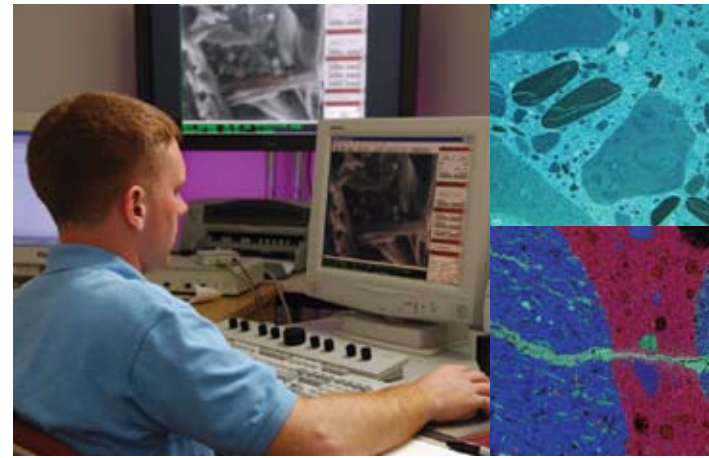
Michigan Tech's University Transportation Center for Materials in Sustainable Transportation Infrastructure (MiSTI), is creating the future of transportation infrastructure. MiSTI supports innovative research, distinctive educational programs, and engages industry in a partnership to explore the sustainable use of materials in the construction, maintenance, and repair of transportation infrastructure. MiSTI promotes the most efficient use of naturally occurring resources, the sustainable use of industrial by-products such as fly ash or recycled materials, across many modes and systems. For more information, visit www.misti.mtu.edu.

Michigan's Local Technical Assistance Program (LTAP) is a joint effort of the Federal Highway Administration's Office of Professional Development and the MDOT Office of Research and National Best Practices. LTAP provides the transportation technology (T2) to local government organizations (counties, cities, and villages) throughout Michigan. The LTAP mission is to bridge the gap between research and practice by conducting training sessions and demonstrations and by serving as a clearinghouse for information related to state-of-the-art technology in the construction and maintenance of roads and bridges. For more information visit, www.michiganltap.org.

The **Transportation Materials Research Center (TMRC)** at Michigan Tech provides technical expertise and state-of-the-art laboratories to support MDOT's transportation materials research and investigation by maintaining highly qualified technical staff and certified facilities. Specific areas of research include the behavior and performance of materials including asphalt, concrete, unbound aggregate, and soils. For more information, visit www.tmrc.mtu.edu.

The **Center for Structural Durability (CSD)** explores research in the area of durable structural highway systems. Areas of expertise include:

- Ultra high performance concrete
- Rapid construction for prestressed concrete bridges
- Inspection and repair for transportation systems and bridges



Structural durability-related research helps DOT, Federal, and industry clients achieve their performance goals of safety, mobility, and productivity of the transportation system while exploring long-term solutions to improve the condition and durability of transportation structures. For more information, visit www.csd.mtu.edu.

The **Tribal Technical Assistance Program (TTAP)** is part of a nationwide effort sponsored by the Federal Highway Administration and the Bureau of Indian Affairs. TTAP explores technology transfer initiatives focusing on technology and information on tribal roads and bridges, tourism, and recreation, and related economic development to tribal transportation and planning personnel. TTAP provides technology transfer through training workshops, a quarterly newsletter, and the operation of free publication and videotape training libraries. For more information, visit www.ttap.mtu.edu.

The **Technology Development Group (TDG)** engages in research and development that supports the transportation management needs of state and local governments. Its primary product, the RoadSoft GIS Integrated Roadway Management System, provides county road commissions, cities, and villages with a state-of-the-art system for managing roadway assets. From pavements, signs, pavement markings, culverts, and traffic crashes, RoadSoft offers assistance in developing repair and construction strategies for streets and highways. Other development projects include the MERL Project Estimator, crash location software, GIS tools, and online data submission. For more information, visit www.roadsoft.org.

The **Aggregate Research Center (ARC)** advances the understanding of aggregates through resource exploration, extraction, materials processing and characterization, regulatory compliance, and aggregate utilization. Multidisciplinary interests offer expertise to solve aggregate related problems and explore solutions for the transportation industry. For more information, visit www.arc.mtu.edu.

The **Sustainable Futures Institute (SFI)**, the **Center for Water and Society**, the **Remote Sensing Institute**, and the **Center for Science and Environmental Outreach** also support research through knowledge transfer and technical expertise, especially in the area of sustainability, and provide an opportunity for students to obtain a Graduate Certificate in Engineering Sustainability. For more information, visit www.sfi.mtu.edu.

The **HI-RISE** group develops integrated approaches to understanding the implications of human decisions in design, construction, planning, and management of civil infrastructure systems. Current research is developing models of expert decisionmaking using interactive simulation platforms. For more information, visit <http://www.construction.mtu.edu:8080/homepage/>.

State-of-the-Art Research Facilities

Benedict Laboratory features 15,000 ft² of Cement and Concrete Reference Laboratory (CCRL) inspected concrete preparation and testing facilities. With high-bay access and an overhead crane, the lab allows for large scale production and testing of conventional, high-strength, and ultra high-performance concrete. The facility is fully equipped for mechanical and durability testing, including a servo-hydraulic test system, a split-Hopkins pressure bar, freeze-thaw machine, and the required data acquisition systems.

Non-Conductive/Volatile Materials Characterization Facility includes a state-of-the-art sample preparation and petrography lab, featuring stereo and petrographic optical microscopes, high resolution digital imaging, x-ray microscopy, an environmental scanning electron microscope, and a full wet chemistry laboratory. This laboratory is staffed with a full-time ASTM C 856 qualified petrographer.

Aggregate and Geotechnical Materials Research and Testing Facilities are AASHTO AMRL accredited. The aggregate pilot plant receives and processes material, including crushing, screening, and grinding for classification in the aggregate preparation lab. The geotechnical research facilities contain advanced material characterization equipment including an advanced servo-hydraulic resilient modulus testing apparatus.

The asphalt materials characterization facilities include the **Asphalt Binder Rheology Testing Facility** and the **Hot Mix Asphalt Testing Facility**. The Asphalt Binder Rheology Testing Facility is fully equipped to perform Superpave binder characterization. The Hot Mix Asphalt Testing Facility is capable of performing standard Superpave mix designs and, in addition to three gyratory compactors, has a slab compactor. Advanced material testing is performed with IPC UTM servo-pneumatic and servo-hydraulic testing systems and an Asphalt Pavement Analyzer. Both facilities are AASHTO Materials Reference Laboratory (AMRL) accredited.

Why Michigan Tech ?

- nationally ranked research and graduate education programs
- civil engineering courses including:
 - rail transportation
 - structural analysis and design
 - construction
 - pavement design
 - materials
 - geotechnical engineering
 - water resources
- more than \$4.5 million in funded research projects annually in transportation research
- 30 percent of invention disclosures list graduate students as the inventor
- 1:4 faculty-to-graduate student ratio in civil engineering
- the only Peace Corps Master's International civil engineering program in the country
- option to earn a Certificate in Engineering Sustainability

How to apply

1. Download an application form from the Graduate School webpage.
APPLY ONLINE FOR FREE!
2. Submit the completed application online, or mail or fax it to the Graduate School.
3. Track the status of your application online.

Visit the Graduate School webpage for complete details about admissions and program requirements.

www.gradschool.mtu.edu

The International Sustainable Development Engineering Initiative includes a graduate partnership with the U.S. Peace Corps. Students enhance their education through opportunities to participate in the Master's International program.



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Current MS, MEng, and PhD Opportunities at Michigan Technological University

Transportation Materials research opportunities exploring the most efficient use of naturally occurring industrial by-products, or recycled materials to increase sustainability of transportation infrastructure. Efforts promoting sustainability will address the economic, environmental, and societal considerations. Focus materials include soils, unbound aggregates, hot-mix asphalt, and portland cement concrete.

Position(s): Four funded research assistant positions are available to explore materials in sustainable transportation infrastructure. PhD and MS students are welcome to apply. These assistantships will be funded by sponsored research from the USDOT and other partners through the University Transportation Center.

Contact: Dr. Van Dam at tvandam@mtu.edu or Dr. Sutter at lsutter@mtu.edu

Sustainable Asphalt Pavement focusing on advances in the use of fly ash, waste tire rubber and wires, polymer modified asphalt, recycled asphalt materials, and warm mix asphalt techniques. Research will explore advances of material characterization such as performance testing of Superpave asphalt mixtures, field and laboratory compaction mechanisms, discrete and finite element modeling of pavement materials, and instrumentation and testing methods.

Position(s): Two funded research assistant positions are available beginning in the spring of 2007. PhD and MS students are welcome to apply. These assistantships will be funded by sponsored research from the USDOT and MDOT.

Contact: Dr. You at zyou@mtu.edu



Modeling Processes at the interface between civil design and construction, using simulations and information visualization. Develop frameworks that address uncertainty and the impact of human decisions. This research will require knowledge of mathematical modeling, computer programming, and an undergraduate degree in Civil Engineering or Information Sciences.

Position(s): One funded research assistant position is available through funding from the National Science Foundation (NSF). PhD and MS students are welcome to apply.

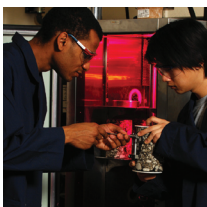
Contact: Dr. Mukherjee at amukherj@mtu.edu



Civil Engineering projects focusing on bridge engineering and durable transportation structures with research topics including ultra high-performance concrete (UHPC). Currently, Michigan Tech has one of the only state-of-the-art university research laboratories capable of mixing, curing, and testing UHPC. Projects may also involve rapid construction techniques for prestressed concrete bridges and improvements in systems, including construction, design, and maintenance of transportation infrastructure.

Position(s): Two to three funded research assistant positions are available. PhD and MS students are welcome to apply.

Contact: Dr. Ahlborn at tess@mtu.edu



continued

Geotechnical Design, evaluation, and aggregate research specifically related to transportation infrastructure and pavement friction and noise with funding from the Federal Highway Administration (FHWA). Research may include improved methods for evaluation, characterization, and improved performance.

Position(s): One to two funded research assistant positions are available. PhD and MS students are welcome to apply.

Contact: Dr. Vitton at vitton@mtu.edu

Finite Element Analysis, structural monitoring and condition assessment, structural reliability analysis, probabilistic design, natural and man-made hazard mitigation, structural load modeling and combinations of loads, performance-based engineering, earthquake engineering, wind engineering, and wood engineering.

Position(s): One to two funded research assistantship opportunities are available. PhD and MS students are welcome to apply.

Contact: Dr. Li at yueli@mtu.edu

Finite Element Analysis, structural monitoring and condition assessment, structural reliability analysis, probabilistic design, natural and man-made hazard mitigation, structural load modeling and combinations of loads, performance-based engineering, earthquake engineering, wind engineering, and wood engineering.

Position(s): One to two funded research assistantship opportunities are available. PhD and MS students are welcome to apply.

Contact: Dr. Li at yueli@mtu.edu

Soil Mechanics, foundational engineering, and soil behavior concentrating on the behavior of natural silts and mine tailings during deposition, consolidation, and aging. Current projects involve the use of Cement Kiln Dust (CKD) for soil stabilization and a fundamental study of the resilient modulus of granular materials.

Position(s): One funded research assistantship opportunity is currently available. PhD and MS students are welcome to apply.

Contact: Dr. Ralph Hodek at rjhodek@mtu.edu

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