About Summer Youth Programs

Summer Youth Programs at Michigan Technological University has been around since 1972. In fact, sharing the excitement of STEM and the college experience with youth is not a new concept at all. Now in our 44th summer, the program has evolved much like the participants it serves. But one constant remains the same: SYP kids are smart—crazy smart. And they’re looking for an edge. They want to know they can hack it in college, and they want to decide if a degree program in science, technology, engineering, or math is the right choice for them.

So we come back each summer, too. It’s so much more than a camp or a class—it’s an experience. For many, it’s life changing. Just ask the more than 650 Huskies on campus today who are also SYP alumni. Ask them about the friends they met. The things they built. And the instructors they studied alongside. These are experience they take with them—everywhere they go.

Testimonials:

• Marissa van den Berg reviewed Michigan Tech Summer Youth Programs—★★★★★
  My son just came home from a two-week technology camp—he can’t stop talking about it! He got to go to the top of the Mackinac Bridge and said it’s been the best two weeks of his life—and he is not one who is easily impressed. Thank you, Michigan Tech!

• Melissa Kramer reviewed Michigan Tech Summer Youth Programs—★★★★★
  Michigan Tech seems to be one of the few colleges in Michigan that accepts middle school-aged students into engineering (a huge draw for future Huskies!). My son is an incoming seventh grader and had a fantastic time. He enrolled in Engineering 101 to get a flavor of the various disciplines. The counselors and professors had a profound impact on him. SYP staff take great care in making the kids feel at home and providing activities to keep students engaged. He’s already making plans to return next summer! Making new friends while learning cool stuff is what SYP is about—I couldn’t be happier with the results.
## Chemical Engineering*

**51420 • Grades 9-11 • July 9-15, 2017**  
Cost: Resident $945/Commuter $525

The greatest challenge for chemical engineers is producing products our society demands in a safe and environmentally friendly way. Explore alternative energy, chemical reactions, and separation processes through laboratory activities. Learn about chemical engineering while operating state-of-the-art equipment in our best-in-class laboratory facilities.

## Civil Engineering*

**51871 • Grades 6-8 • July 16-22, 2017**  
**52116 • Grades 9-11 • July 9-15, 2017**  
Cost: Resident $895/Commuter $475

How do civil engineers design bridges strong enough to hold traffic? How do they provide drinking water to our homes, design roadways and infrastructure for transportation, and make sure the waste leaving our homes doesn’t harm us or the environment? What are some civil engineers doing to help communities in third-world countries? Answer these and other questions by making and breaking concrete, creating models, experiencing various civil engineering roles, and visiting real structures designed by civil engineers.

## Electrical and Computer Engineering

**51421 • Grades 9-11 • July 9-15, 2017**  
Cost: Resident $895/Commuter $475

Imagine the future of smart electronics and learn how engineers create them. Explore computer and electrical engineering through simple circuits and digital logic. Perform more than 10 experiments—including designing and constructing your own printed circuit board—that demonstrate principles of computer and electrical engineering.

## Engineering 101

**51422 • Grades 6-8 • July 9-15, 2017**  
**51423 • Grades 9-11 • July 16-22, 2017**  
Cost: Resident $920/Commuter $500

Not sure which engineering area appeals to you? Explore a variety of disciplines, including mechanical, electrical, chemical, civil, and environmental engineering. Discover whether metal has a memory; learn how to purify water; program a robot; design and build bridges, gliders, and/or prosthetic legs; and test what you build to see how they perform. You’ll work in teams to approach engineering challenges from a fresh perspective.

## Geological Engineering

**51720 • Grades 9-11 • July 9-15, 2017**  
Cost: Resident $920/Commuter $500

Journey through the incredible history of the Keweenaw’s geology: from the formation of an ancient volcanic rift and its enormous loads of native copper, to the glaciers that uncovered them, as well as the miners who powered the local copper mining industry. In the lab, you will discover how rocks and minerals are formed and learn to use specialized tools and the scientific method to identify them. In the field, you will examine geological evidence; map ancient lava flows and rock beds; explore underground mines; collect samples at old mines and on the beaches of Lake Superior; and sharpen your skills as a geologist.

## Robotics 101: Benefiting Human Life

**52046 • Grades 6-8 • July 9-15, 2017**  
Application deadline is May 1, 2017 at 5 p.m.  
Cost: Resident $895/Commuter $475

Discover robotics and the application of robots in human life from two new perspectives: exploring the environment and augmenting human capabilities. In this exploration, students practice engineering through design, production, and programming two of Michigan Tech’s robots—GUPPIE, an underwater glider, and Neu-Pululator, an EMG-controlled manipulator. Students learn how to program hobby-level microprocessors, wire circuits, solder electronic components, assemble, test, and troubleshoot their robots.

**Note:** Scholarships may be available for this course. Please contact the Summer Youth Programs office for information.

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**Note:** Students should wear long pants and sturdy, closed-toe shoes or boots. Be prepared to get dirty.
Materials Science and Engineering*  
**Capacity:**  
51424 • Grades 6-8 • July 16-July 22, 2017  
51793 • Grades 9-11 • July 23-29, 2017  
Cost: Resident $920/Commuter $500

Materials are everywhere, and understanding their basic science allows us to engineer new and improved materials. What are materials? How do we create materials? And how do we measure their behaviors so we can compare them? How do we look into the structure of materials? Find the answers to these questions as you create your own metals, ceramic composites, and polymers; compete for the strongest and bounciest polymer; and learn the ancient art of blacksmithing. Plus, discover how atoms are assembled and how they behave.

**Mechanical Engineering—Automotive Engineering**  
**Capacity:**  
51425 • Grades 9-11 • July 9-15, 2017  
Cost: Resident $945/Commuter $525

Learn the basics of engines and vehicle technology while discovering the world of automotive engineering. See the vehicles Michigan Tech student-teams take to competitions like the Clean Snowmobile Challenge, Formula SAE, Baja SAE, Hybrid Electric Vehicle, and Supermileage—and tour facilities where students design, build, and test.

**Mechanical Engineering—Design the Future**  
**Capacity:**  
51863 • Grades 9-11 • July 23-29, 2017  
Cost: Resident $945/Commuter $525

Explore mechanical and machine design, manufacturing, and energy systems. Plus, visit labs and get a look at opportunities in mechanical engineering.

**Mechanical Engineering—Engineering the Human Body**  
**Capacity:**  
52124 • Grades 9-11 • July 16-22, 2017  
Cost: Resident $945/Commuter $525

Learn to look at the body from a mechanical-engineering perspective, characterizing the mechanical properties of the human body. Topics include design for safety, mobility, biomimetic design, and the human-technology interface.

**Mining Engineering and Operations**  
**Capacity:**  
51795 • Grades 9-11 • July 16-22, 2017  
Cost: Resident $920/Commuter $500

Explore the field of mining engineering. You’ll look at autonomous underground mine truck operations, plus the technologies that model mines and their inner workings. This program provides mine system simulation and animation modeling experience. You will learn about a lab-scale autonomous mine truck, explore the applications of autonomous equipment in mining engineering, and visit mine sites around the Keweenaw.

**Mobile Robotics**  
**Capacity:**  
51461 • Grades 9-11 • July 16-22, 2017  
51794 • Grades 6-8 • July 23-29, 2017  
Cost: Resident $920/Commuter $500

Jump into the world of autonomous mobile robotics. From concept to construction to computation, this exploration involves building and programming your own robot. Students will solder, build, and program their way through mini-competitions.
Aquatic Ecology
51437 • Grades 6-8 • July 16-22, 2017
Cost: Resident $895/Commuter $475

Learn about freshwater ecology in Upper Michigan’s Keweenaw Peninsula. Who’s eating who in the Great Lakes and what makes species invasive? What is lurking in your backyard stream? And why are some lakes clear, while others are green and murky? Find out the answers to these questions as you learn all about lakes and streams. You’ll start with different types of plant life and work your way up the food chain to invertebrates and fish. Build your own model ecosystems, explore your own research questions, and participate in activities—outdoors and inside our science labs. Be prepared for variable weather, hands-on activities, and beautiful scenery.

Note: Camping, hiking, and other gear is required; a packing list will be sent with your Welcome Packet.

Aquatic Ecology: Field Study at Gratiot Lake
51438 • Grades 9-11 • July 23-29, 2017
Cost: Resident $895

Spend a week living in a rustic log cabin on Gratiot Lake, in the heart of the Keweenaw Peninsula. Live the life of an ecologist as you collect and analyze aquatic invertebrates, compare water chemistry data, and learn how much fun ecology can be—no matter the weather. You’ll learn tracking and casting techniques, explore the ecology of Lake Superior, and discover how to identify invertebrates.

Note: Live-in only. Some camping gear is required; a packing list will be sent with your Welcome Packet. Visit the Gratiot Lake Conservancy at gratiotlakeconservancy.org for information about where you’ll spend your week—electricity and running water will not be available during our trip to the Conservancy. If you are a student from the Keweenaw Peninsula, you may be eligible to apply for the Sandretto Scholarship. See our website for more details.

Aviation and Aerospace
51426 • Grades 9-11 • July 23-29, 2017
Cost: Resident $995/Commuter $575

Explore general aviation and what is required to achieve a private pilot license. You’ll learn about the aerodynamics of flight, how to read aeronautical charts, and how to plot a course, which will be “flown” using a computer-based flight simulator. You’ll also have the chance to ride in a general aviation airplane. Instructors are a mix of certified flight instructors, retired airline pilots, and former military pilots. Explore a variety of career possibilities, including general aviation pilot, military pilot, commercial pilot, FAA radar controller, and unmanned aerial vehicle pilot.

Note: An additional Young Eagles permission form is required. It will be sent to you after enrollment.

Forensic Science and CSI*
51428 • Grades 9-11 • July 9-15, 2017
51429 • Grades 6-8 • July 16-22, 2017
51430 • Grades 9-11 • July 23-29, 2017
Cost: Resident $920/Commuter $500

Can you track down a criminal? Learn how forensic scientists solve crimes through procedures like DNA analysis, blood-typing and splatter analysis, and facial reconstruction. Examine bones and tooth impressions, and perform your own autopsy through a class dissection. Students will work in a team to investigate and solve a mock crime scene.

“I delved deep into my STEM interests, and now I have a better idea of what I want to do and why.”
—2016 SYP Participant
Genetic Modification and Biotechnology*
51431 • Grades 9-11 • July 16-22, 2017
Cost: Resident $920/Commuter $500

Genetic transformations techniques are used to improve the production of a product in both number and quality. Learn how to genetically modify bacteria using a heat shock transformation procedure; insert foreign DNA (a pGLO plasmid isolated from jellyfish) into Escherichia coli to make the bacteria glow in the dark; and explore the ethics of genetic engineering, such as designer babies, genetically modified plants and feedstocks, cloning, and antibiotic production.

Medical Physiology*
51432 • Grades 9-11 • July 9-15, 2017
51721 • Grades 6-8 • July 23-29, 2017
Cost: Resident $895/Commuter $475

How do body systems work together? Discover how a healthy body functions and explore the structure and physiology of muscles, lungs, the heart, blood, and the nervous system. Record and interpret an electrocardiogram, perform vision tests, and measure your reflex time under various conditions.

Introduction to Microbiology
51864 • Grades 6-8 • July 16-22, 2017
Cost: Resident $945/Commuter $525

Explore a world unseen by the naked eye! In this course, you’ll learn basic microbiology techniques—like how to use a microscope, stain specimens, streak pure cultures, and perform cell-density and viability counts. You’ll also be introduced to classifications of microorganisms and their characteristics. Explore career paths, including laboratory technology in medical and industrial fields.

Medical Laboratory Science*
51427 • Grades 9-11 • July 9-15, 2017
Cost: Resident $920/Commuter $500

Medical laboratory scientists use their background in biology and chemistry to develop test procedures that improve the healthcare industry. Perform your own lab exercises in clinical chemistry, immunology, parasitology, microbiology, hematology, blood banking, and urinalysis. Activities can include: testing blood glucose and cholesterol; testing for infectious mononucleosis; looking for malaria, pinworms, or giardia (parasitology); growing and identifying possible disease-causing bacteria (microbiology); and looking at blood cells (hematology). Safety protocols are closely followed.

Rocketry and Space Science
Capacity: 15 (Grades 6-8) 20 (Grades 9-11)
51865 • Grades 6-8 • July 9-15, 2017
51866 • Grades 9-11 • July 23-29, 2017
Cost: Resident $945/Commuter $525

Get involved in the excitement of rocketry! You’ll learn about aerodynamics and propulsion while designing and building your own rocket. During the week, you’ll refine your plan, use software to improve your design, and launch your rocket up to 1,500 feet. Exploring rocketry will teach you about physics, engineering, and career opportunities in science.

Note: For explorations that take place in laboratories, students are required to wear long pants and closed-toe shoes. Bare-midriff tops and open shoes (sandals or flip-flops) are not permitted.
<table>
<thead>
<tr>
<th>Science &amp; Technology Programs</th>
<th>Capacity</th>
<th>Cost: Resident</th>
<th>Commuter</th>
<th>Description</th>
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<tr>
<td><strong>Wild World of Chemistry</strong></td>
<td>15 (Grades 6-8)</td>
<td>$920</td>
<td>$500</td>
<td>In this program, you'll prepare slime and other cool, polymer materials to discover the weird-and-wild properties that set them apart from “normal” materials. You’ll synthesize aspirin in the same laboratories used by Michigan Tech students; visit the A. E. Seaman Mineral Museum to learn more about minerals/ores; and explore a historical site to sample stamp sand—you can even extract copper! Get ready to discover the amazing properties of DNA by isolating some of your own. You’ll explore light emission, light absorption, and other unique characteristics that affect the structure and behavior of matter. Chemical demonstrations, experiments, videos, computer simulations, and tours of the chemistry research facilities will be used to clarify concepts and show how scientists think and work.</td>
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<tr>
<td><strong>Wildlife Ecology</strong></td>
<td>12</td>
<td>$895</td>
<td>$475</td>
<td>The diverse habitats of Michigan’s Upper Peninsula support a variety of plant and animal species. Get a close look at protecting and conserving our natural resources for the plants and animals that rely on them. Your observational skills will be challenged as you search for animal tracks, signs, scents, sounds, and other indicators of quality habitats. Track animals using telemetry with a map and compass. Identify and make plaster castings of animal tracks and learn how to set noninvasive hidden camera and hair traps.</td>
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<td><strong>Note:</strong> Participant should be in good physical condition.</td>
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<td><strong>Note:</strong> For explorations that take place in laboratories, students are required to wear long pants and closed-toe shoes. Bare-midriff tops and open shoes (sandals or flip-flops) are not permitted.</td>
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**What to bring:** A calculator; a lab coat, smock, or oversized T-shirt; and your own goggles (optional)
3-D Models and Virtual Reality

Capacity: 20

51654 • Grades 9-11 • July 23-29, 2017
Cost: Resident $895/Commuter $475

3-D computer games and animated movies simulate virtual worlds using 3-D models. In this course, you will create your own 3-D model using Google SketchUp and view your creation in a head-mounted display system in Michigan Tech’s Virtual Reality Lab. You’ll also learn about virtual-reality technologies, 3-D photographs, and basic computer programming.

App and Web Development: Designing for Humans

Capacity: 20

51749 • Grades 9-11 • July 16-22, 2017
Cost: Resident $895/Commuter $475

Every day, humans interact with software through mobile devices, websites, and more. How do we make software people want to use? In this exploration, we’ll examine existing apps and websites to learn how to recognize good elements of interface design including spatial ordering, color scheme, navigation, and interaction. You’ll apply these principles to develop your own mobile apps and websites using user-centered design.

Coding for the Internet of Things

Capacity: 20

52330 • Grades 9-11 • July 9-15, 2017
Cost: Resident $895/Commuter $475

More and more everyday objects have network connectivity, allowing them to send and receive data or be programmed and controlled over the internet. We call this the Internet of Things (IoT). In this course, students learn the fundamentals of programming while interacting with online devices. You will learn to monitor, control, and program the Internet of Things!

Computing Elements

Capacity: 15

52342 • Grades 9-11 • July 9-15, 2017
Cost: Resident: $945 / Commuter: $525

Ever wonder how computers work, beneath all those lines of code? In just one week, you’ll learn the fundamentals of digital logic, and the design and implementation of logic circuits. From flashing lights, to building a robot, and even making a simple processor (from your own design!), this class will teach you all about the basics of electronics (with a digital logic focus), and the elements beneath today’s technological marvels. Previous coding and electronics experience is helpful, but only motivation to learn and create is required!
Introductory Video Game Programming  
Capacity: 20  
51436 • Grades 6-8 • July 9-15, 2017  
Cost: Resident $895/Commuter $475

Intro to Video Game Programming offers a first look at programming for budding game developers. You’ll cover the fundamentals of game design through a series of mini-games illustrating concepts like collision, animation, basic AI techniques, and state-machines. In addition to lectures and guided work sessions, you will be given time to create and experiment in a hands-on environment. Introductory material will make use of the Processing (processing.org) environment and work up to coding with the Java programming language. You will leave with game coding experience and the knowledge to continue learning about programming on your own.

Note: This course assumes no previous experience with computer programming.

Video Game Programming  
Capacity: 20  
51956 • Grades 9-11 • July 23-29, 2017  
Cost: Resident $895/Commuter $475

Video Game Programming offers a faster-paced crash-course in programming for budding game developers. You’ll cover the fundamentals of game design through a series of increasingly complex mini-games illustrating concepts like collision, animation, basic AI techniques, and state-machines. In addition to lectures and guided work sessions, you will be given time to create and experiment in a hands-on environment. Introductory material will make use of the Processing (processing.org) environment and work up to coding with the Java programming language. You will leave with game coding experience and the knowledge to continue learning about programming on your own.

Stop the Hackers!  
Capacity: 15  
51435 • Grades 9-11 • July 16-22, 2017  
Cost: Resident $895/Commuter $475

Do you wonder how computer hackers infiltrate a system and steal information? Do you want to learn how to keep your system safe? Come and explore the world of computer security. Discover the kinds of attacks that hackers launch, such as key loggers, viruses, Trojan horses, and phishing. Explore ways to keep your information safe using cryptography, access control, and virus detection.

“Without attending this program, I would not have known what I am capable of achieving. Hands down, this was one of the best experiences of my life.”  
—2016 SYP Participant
BUSINESS, HUMANITIES, AND SOCIAL SCIENCES

Be Your Own Boss
51462 • Grades 9-11 • July 23-29, 2017
Cost: Resident $895/Commuter $475
Capacity: 20
Learn what it takes to start your own business! This course will take you through the steps of how to be a successful entrepreneur. You’ll learn how to develop a business plan and how to market to a target audience. Each day of the week will be dedicated to different activities that will teach you business skills, including marketing, finance, management, and sales. Advertising avenues will be explored—students will study marketing approaches using television, radio, newspaper, and social media like Twitter and Facebook. When it comes time to launch, students will have the opportunity to sell products during a variety show.

Blacksmithing
51440 • Grades 9-11 • July 9-15, 2017
Cost: Resident $945/Commuter $525
Capacity: 10
Explore the art of blacksmithing. Learn how to draw out your metal, punch holes, upset the end of a bar, and split steel with a chisel. You’ll also have the opportunity to bend, rivet, and twist bars, as well as make scrolls. Build your own forge and anvil to begin smithing on your own.
What to bring: Old jeans, long-sleeved shirt, and leather shoes (no open-toe shoes). Do not wear flammable materials.

Computer Graphics and Design
51655 • Grades 9-11 • July 16-22, 2017
Cost: Resident $895/Commuter $475
Capacity: 20
Translate your creative and visual design ideas into actual computer art. Learn some of the most adaptable design principles and how to apply them to your own text, illustrations, and photographic compositions. Create your own marketing, brand, and design with a personal website.

Digital Photography
51441 • Grades 6-8 • July 9-15, 2017
51798 • Grades 9-11 • July 16-22, 2017
Cost: Resident $895/Commuter $475
Capacity: 15 (Grades 6-8) 20 (Grades 9-11)
Digital photography combines art, technology, and the great outdoors! While on explorations throughout the Keweenaw Peninsula, you’ll capture images of beautiful shorelines, waterfalls, and abandoned mine structures. Learn about exposure, composition, and visualization. Explore creative possibilities as you refine your images with software like Adobe Photoshop.
What to bring: A DSLR is strongly recommended for this course. Hybrid and more basic cameras are also appropriate as long as settings like exposure, aperture, and shutter speed can be adjusted. You should also bring a memory card, card reader, flash drive or external hard drive, and a battery charger. If you have them, bring an extra battery, your camera manual, a camera case, a tripod, and any lenses or accessories. Since you will be spending many hours outdoors, bring comfortable walking or hiking boots, insect repellent, sunscreen, and a water bottle.
BUSINESS, HUMANITIES, AND SOCIAL SCIENCES

Global Discovery 101
52331 • Grades 9-11 • July 23-29, 2017
Cost: Resident $895/Commuter $475

Our world is interconnected—with many cultures, languages, and perspectives influencing the way we live, learn, and interact with one another. In week, you’ll explore the heritage of the Keweenaw Peninsula through field trips and excursions, participate in leadership activities, and develop the skills to build and unite multicultural communities through music, dance, cooking, crafts, fashion, food, and language.

The World of Design
52332 • Grades 9-11 • July 23-29, 2017
Cost: Resident $895/Commuter $475

Want to make the next big social media platform like Snapchat? Create a spaceship that travels to Mars? Design a handheld water filter? Design-thinking principles are all around you. In this program, you’ll explore complex problem-solving, collaboration, and human-centered design through hands-on activities.

Psychology in the Real World
51867 • Grades 9-11 • July 23-29, 2017
Cost: Resident $895/Commuter $475

Find out how psychology impacts everyday life. In this course, you will explore basic psychology issues in learning, sensation and perception, decision-making, and research in behavioral sciences. To highlight these principles, you will experience demonstrations on topics like behavior modification, visual illusions, and social experiments.

Note: Please bring business casual clothing to wear during field trips.

“SYP gave me the chance to step out of my comfort zone and experience things I never would have on my own. The only thing I regret is not being able to do this again next summer.”

—2016 SYP Participant
**OUTDOOR ADVENTURES**

Offered in partnership with Michigan Tech's Outdoor Adventure Program (OAP).

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**Island Explorations on Isle Royale***

51792 • Grades 9-11 • June 25-July 1, 2017
52333 • Grades 9-11 • July 23-July 29, 2017

Cost: Resident $895

Head to Isle Royale National Park for a hiking and camping adventure on one of the least-visited national parks! Prior to leaving the mainland, we will cover basic principles of Leave No Trace Ethics, what to expect while on the island, review health and dietary needs, and finalize packing for the trip. Group gear, such as tents, cooking equipment, stoves, and water filters, will be distributed Sunday evening. While on the island, we will explore Rock Harbor, Three Mile, and Daisy Farm. Highlights include hiking to the top of Mt. Ojibway and Mt. Franklin, swimming in Lake Superior, stargazing, and maybe even a moose sighting!

**Note:** Live-in only. This exploration returns to campus after the charter bus has departed. Please make overnight accommodations and travel arrangements accordingly.

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**Keweenaw Outdoor Adventure 101**

52118 • Grades 6-8 • July 9-15, 2017

Cost: Resident $895/Commuter $475

During Keweenaw Outdoor Adventure 101 participants hike, check out waterfalls, explore beaches and bluffs, and learn about the history of this area. Each day is spent exploring and learning about a new outdoor recreation location in the Keweenaw Peninsula. Participants are introduced to basic outdoor recreation concepts including water filtration, Leave No Trace Wilderness Ethics, basic map reading, and geoheritage topics.

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**Outdoor Skills and Leadership on the North Country Trail***

51868 • Grades 9-11 • June 18-24, 2017
52334 • Grades 9-11 • July 16-22, 2017

Cost: Resident $895

Have a blast in an outdoors-based leadership program while developing skills, confidence, and trust. Participants will spend Monday morning planning out details for the final trip. Then we will head to the North Country Trail to begin our multi-day backpacking exploration. Skills taught include: water-filtration methods, proper packing of equipment, cooking in the outdoors, and food safety and care in the wilderness. Participants will gain a greater understanding of working with groups in the outdoors, as well as basic risk management tools.

**Prerequisite:** Island Explorations on Isle Royale and Outdoor Skills and Leadership on the North Country Trail students should be able to carry a backpack (30-40 pounds of equipment, food, and supplies) for three to five miles per day.

**Note:** Outdoor Adventures require camping, hiking, and other outdoor gear. A detailed packing list and gear rental guide will be sent with your Welcome Packet.
COMPETITIVE SCHOLARSHIPS

Students are selected for scholarship programs on a competitive basis. To apply for a scholarship program, visit syp.mtu.edu and complete the application form for the program you’re interested in. Submit your application along with a teacher recommendation, your unofficial high school transcript, and your responses to short essay questions. Applications will be reviewed by our selection committee in April and you will be notified of our decision in mid-May. Programs have varying deadlines; please verify application due dates listed beneath each program title. Please see our website for more information.

Engineering Scholars Program (ESP)

Capacity: 150
51719 • Grades 9-11 • June 25-July 1, 2017
Application deadline is April 10, 2017 at 5 p.m.
For early acceptance, please submit application by March 1, 2017.
Cost: A nonrefundable registration fee of $295 is due within 10 days of acceptance

The Engineering Scholars Program (ESP) provides an opportunity for traditionally underrepresented students to explore 10 fields of engineering through projects and classroom investigations. Explore real engineering labs; meet and interact with leaders and role models; and take trips throughout the Keweenaw Peninsula—all while learning about career opportunities and meeting other talented students with similar interests. This program is an investigation of careers in mechanical, computer, environmental, electrical, chemical, biomedical, civil, geological, and materials engineering.

• Explore engineering by constructing a building that can withstand an earthquake and creating your own message encryptor (share secrets only your friends can read).
• Get the inside scoop from role models working in engineering fields.
• Work in teams to complete engineering projects.
• Learn about the college application process and get tips for succeeding in university engineering programs.

Junior Women in Engineering (JWIE)

Capacity: 20
52120 • Grades 6-8 • July 23-29, 2017
Application deadline is April 10, 2017 at 5 p.m.
Cost: A nonrefundable registration fee of $295 is due within 10 days of acceptance

The Junior Women in Engineering (JWIE) program provides an opportunity for academically talented young women to explore mechanical, electrical, chemical, civil, and environmental engineering. Tour real engineering labs, meet and interact with female leaders and role models, and take trips throughout the Keweenaw Peninsula—all while investigating career opportunities and meeting other talented students with similar interests.

• Discover whether metal has a memory.
• Get the inside scoop from female role models working in engineering fields.
• Work in teams to complete engineering projects.
• Design and building bridges, gliders, and prosthetic legs.
• Learn how to purify water.
National Summer Transportation Institute (NSTI)
51454 • Grades 9-11 • July 16-29, 2017
Application deadline is May 1, 2017 at 5 p.m.

The National Summer Transportation Institute (NSTI) is a two-week exploration of modern transportation, including air, rail, road, and water. Travel to exciting locations including the Soo Locks shipping canal between Lake Superior and the Lower Great Lakes, and tour the Mackinac Bridge Authority. Do group projects, meet other talented students, and learn about career opportunities in the transportation industry. Program is live-in only.

• Explore today’s top transportation industries! Michigan Tech is the state’s only residential host site of this program.
• Learn about airplanes, trains, ships, and automobiles through cool, hands-on activities and group projects.
• Tour the Mackinac Bridge Authority and get behind-the-scenes information about the Mighty Mac, the longest suspension bridge in the Western Hemisphere.
• Travel to Sault Ste. Marie and learn firsthand about the Soo Locks shipping canal, the largest waterway traffic system on Earth.
• Spend your time with other crazy smart students in a university setting.
• Enjoy recreational activities and time outdoors in the Keweenaw Peninsula.

Rail and Intermodal Transportation
Capacity: 30

51460 • Grades 9-11 • July 9-15, 2017
Application deadline is May 1, 2017 at 5 p.m.

Cost: A nonrefundable $100 registration fee is due within 10 days of acceptance. The remaining balance will be due before June 1.

Explore the world of rail and intermodal transportation. Why are trains called the green transportation alternative? How fast can high-speed passenger trains travel? How do containers find their way from China to the United States? What’s the latest on alternative fuels and train control systems? Find out the answers to these questions as you enjoy technical and hands-on tours of rail and intermodal facilities in Ishpeming/Marquette and Duluth/Superior. Ask the experts and see for yourself!

Note: Live-in only; this exploration will travel to various locations throughout the week.

“The Engineering Scholars Program taught me about the fields of engineering. I found I have a true passion for it, and want to pursue it as my future career.” —2016 ESP Participant
Women in Automotive Engineering (WIAE)

Capacity: 24

52121 • Grades 9-11 • July 23-29, 2017

Application deadline is April 10, 2017 at 5 p.m.

Cost: A nonrefundable registration fee of $295 is due within 10 days of acceptance

The Women in Automotive Engineering (WIAE) program provides an opportunity for academically talented young women to explore the fields of mechanical and electrical engineering within the automotive industry. Through projects and classroom investigations, the participants will have a better understanding of the importance of automotive engineering. Explore real engineering labs; meet and interact with female leaders and role models; and take trips throughout the Keweenaw Peninsula—all while investigating career opportunities and meeting other talented students with similar interests. This program is an investigation of careers in automotive engineering.

• Learn the basics of how vehicles operate, and how engineers approach designing one.
• Perform hands-on activities in real engineering facilities to understand complex vehicle systems.
• Hear from role model speakers about their experiences in industry.
• See the vehicles Michigan Tech student-teams take to competitions like the Clean Snowmobile Challenge, Formula SAE, Baja SAE, Hybrid Electric Vehicle, and Supermileage—and tour facilities where students design, build, and test.
• Work in teams to complete engineering projects, and learn the basics of engines, infotainment, cabin comfort, energy, electrified vehicles, chassis and suspension systems, and other vehicle technology.
• Run a hybrid-vehicle dynamometer test cell.
• Calibrate software systems on a production vehicle.
• Evaluate and improve vehicle interior and infotainment systems.
• Learn about the college application process and get tips for succeeding in university engineering programs.

Women in Computer Science (WICS)

Capacity: 20

51796 • Grades 9-11 • June 25-July 1, 2017

Application deadline is April 10, 2017 at 5 p.m.

Cost: A nonrefundable registration fee of $100 is due within 10 days of acceptance

Women in Computer Science (WICS) is a discovery of computing—a field that’s an integral part of our lives. Experience different areas of computing, including programming, artificial intelligence, robotics, virtual reality, visualization, networks, and security. Learn about career opportunities and job prospects in a wide range of industries. Plus, interact with alumni and role models to get firsthand accounts of the diverse careers in computing.
Women in Engineering (WIE)
51442 • Grades 9-11 • June 18-24, 2017
Capacity: 150
Application deadline is April 10, 2017 at 5 p.m.
For early acceptance, please submit application by March 1, 2017.
Cost: A nonrefundable registration fee of $295 is due within 10 days of acceptance.
The Women in Engineering (WIE) program provides an opportunity for academically talented young women to explore 10 fields of engineering through projects and classroom investigations. Explore real engineering labs; meet and interact with female leaders and role models; and take exciting trips throughout the beautiful Keweenaw Peninsula—all while investigating career opportunities and meeting other talented students with similar interests. This program is an investigation of careers in areas including mechanical, computer, environmental, electrical, chemical, biomedical, civil, geological, and materials engineering.

- Explore engineering by constructing a building that can withstand an earthquake and creating your own message encryptor (share secrets only your friends can read).
- Get the inside scoop from female role models working in engineering fields.
- Work in teams to complete engineering projects.
- Learn about the college application process and get tips for succeeding in university engineering programs.

Women in Robotics
52122 • Grades 6-8 • July 16-22, 2017
Capacity: 30
Application deadline is May 1, 2017 at 5 p.m.
Resident Cost: A nonrefundable $100 registration fee is due within 10 days of acceptance. The remaining balance of $200 is due before June 1.
Commuter Cost: A nonrefundable $100 registration fee is due within 10 days of acceptance.
Discover robotics and the application of robots in human life from two new perspectives: exploring the environment and augmenting human capabilities. In this exploration, students practice engineering through design, production, and programming two of Michigan Tech’s robots—GUPPIE, an underwater glider, and Neu- pupulator, an EMG-controlled manipulator. Students learn how to program hobby-level microprocessors, wire circuits, solder electronic components, assemble, test, and troubleshoot their robots.

Note: Our Competitive Scholarship Programs maintain an intense schedule, but offer a unique opportunity to explore careers and experience college life—stay in a residence hall, explore campus, and meet other young students with similar backgrounds and interests. Scholarship amounts vary, and are valued up to $1,000 to cover tuition, room and board, and supplies. Please see individual scholarship applications for details on each program.
Where is Michigan Tech?
Michigan Tech is located in Houghton, Michigan, near the shores of Lake Superior in the beautiful Upper Peninsula.

Who can attend Michigan Tech Summer Youth Programs?
Any students completing grades 6-11 are eligible to attend Michigan Tech’s Summer Youth Programs. Both middle school and high school programs offer students exciting, hands-on explorations on a wide variety of topics. Middle school explorations are open to students completing grades 6-8 and focus on providing an engaging introduction to the subject. High school explorations, open to those completing grades 9-11, encourage students to explore a field of study they are interested in pursuing in college. Academically high-achieving students completing grades 9-11 can also apply for Michigan Tech’s Competitive Scholarship Programs, which focus on specific areas of study.

How many participants are in each exploration?
Most explorations are limited to 20 or fewer students so instructors can give one-on-one instruction. Some explorations—like backpacking and mountaineering—are smaller for safety reasons. We train and employ more than 150 instructors, activity counselors, residence counselors, and staff. We intentionally keep our student-to-staff ratio low, at about 10:1.

What is the daily schedule?
(Note: Each Competitive Scholarship Program schedule may differ.)

Sunday
10 a.m.-2 p.m. Registration and activities
12 p.m. and 1 p.m. Campus tours (parents welcome)
3 p.m. Mandatory orientation and commuter meeting (parents welcome)
4-6 p.m. Dinner
6-9:30 p.m. Recreational activities
9:30 p.m. Floor time, get-to-know-you meeting
10:45 p.m. In-room quiet time

Monday-Friday
7-9 a.m. Breakfast
9 a.m.- 12 p.m. Exploration sessions
12 p.m. -1 p.m. Lunch
1:15-4:30 p.m. Exploration sessions
4:30-6 p.m. Dinner (Friday: checkout begins)
6-10 p.m. Recreational activities/supervised free time
10 p.m. Floor time
10:45 p.m. In-room quiet time

What will I be doing in the evenings?
Everything! Our full-time counselors plan and lead so many evening and weekend activities, you won’t have a minute to be bored. A few activities, like going for ice cream or to the movies, have a small fee, but most are free. Examples of activities include:

- Bowling
- Movies
- Board games
- Basketball, volleyball, soccer, and tennis
- A variety show
- 4-square/ladder ball
- Arts and crafts
- Touring the Keweenaw Peninsula
- Swimming (at the pool or a local beach)
- Capture the Flag
- Dancing
- Hiking and jogging along the waterfront
- Shopping at the Campus Bookstore and local stores
- Fast-food runs
- Hanging out with friends
- Relaxing in the Michigan Tech Library
- Exploring a state park
Where will I stay?
Our live-in participants enjoy campus living in Wadsworth Hall, Michigan Tech’s largest residence hall. Staff and participants are housed in self-contained, secure areas. Participants have access to residence hall laundry facilities (minimal fee), recreation areas, and lounges. We have full-time, live-in counselors who provide supervision, interact with participants, and help keep students safe.

Who will I room with?
Our residence halls are divided by gender, and we take great care to match each participant with a roommate who is close in age, but from a different location.

We encourage participants to broaden their horizons and room with someone new. However, some students prefer rooming with someone they already know, like a sibling or friend. These requests are honored whenever possible. Both friends must request each other on the appropriate form in their Confirmation Packets. If you request to room with a friend, but your friend does not request you, you will not be placed together; it will not be possible to switch rooms when you arrive.

If I stay for more than one exploration, do I have to leave campus during the weekend?
For participants who come for two or more consecutive weeks of Summer Youth Programs, we offer weekend activities in the area. Stay-over fees are $125 per weekend and include meals, lodging, and supervised excursions. Weekend activities can include beach barbecues, copper mine tours, a trip to historic Fort Wilkins State Park, hiking, kayaking, and boat tours.

Where can my family stay?
Many people make a family vacation out of their trip to Michigan Tech. The area is known for its beaches and waterfalls, shopping, historical downtowns, and tourist attractions. Cottages, hotels, bed and breakfasts, and camping facilities are available. For more information, visit keweenaw.info.

What are my options for traveling to Michigan Tech?
Making your transportation arrangements early helps ensure smooth travels and allows our staff to prepare for your arrival. You can choose to travel to Michigan Tech by Summer Youth Programs charter bus, car, or plane.

Summer Youth Programs charter bus: Michigan Tech offers a chaperoned charter bus service from select locations in the Midwest—tentatively St. Ignace, Bay City, Lansing, Wixom, Rochester, Gaylord, Grand Rapids, Kalamazoo, and Chicago. Space is available on a first-come, first-served basis, with preference given to round-trip riders. Students are picked up on Saturday evening, travel through the night, and arrive on campus Sunday morning. This is the most popular way for students to travel; you will have the opportunity to meet staff and fellow students before arriving at Michigan Tech. Fees are:

- Round-trip fee of $275—Includes a $25 nonrefundable deposit. No refunds after June 1. You may choose to be picked up and dropped off at different locations and still qualify for the round-trip rate.
- One-way fee of $175—Includes a $25 nonrefundable deposit. No refunds after June 1.

Charter bus payments must be paid in full within 10 days of purchase. Charter transportation requests are not guaranteed until you receive confirmation from SYP. If you request a seat after we have reached capacity, you will receive a refund of any transportation fees paid (including the $25 deposit).

Car: Often, students choose to travel to campus with family. The local area offers beautiful scenery, attractions, and lodging options for families choosing to stay for the duration of the program. Directions and lodging information can be found at mtu.edu/admissions/visit/ lodging.

Live-in students are not permitted to drive during our programs, so those arriving alone by car will need to purchase a $15 parking pass, be assigned a parking area, and their keys will be stored in the SYP safe.

Air: Houghton County Memorial Airport (CMX) is only a 15-minute drive from campus and is serviced by United Airlines. Students who fly to Houghton will be met and transported to Michigan Tech by SYP staff members wearing official shirts and name tags. Visit united.com for more information on flights. Please be sure to review their updated unaccompanied minor policy.

Can I commute?
Commuters often reside with parents at home, family friends, or relatives. Explorations are available at a reduced fee for commuter students who do not wish to live in the residence hall. Lunch is included, and commuters are strongly encouraged to attend evening recreational activities. Summer Youth Programs will verify where the student is residing, and the participant must agree to follow live-in student rules while on campus.

Note: Several explorations involve travel or late-evening activities and are not available to commuters. See descriptions for details.
How much do Summer Youth Programs cost?
We remain one of the most affordable programs in the nation, and we work to keep our costs low so our programs are accessible to as many people as possible. Fees may vary; please see exploration descriptions for specific costs.

Middle school and pre-college explorations—live-in SYP weeks 1, 2, 3 (July 9-29): $895 per exploration
A nonrefundable $100 deposit per exploration is required to guarantee your enrollment; please pay your fee online, by phone, or by mail within 10 days of submitting your online or paper application.

Middle school and pre-college explorations—commuter SYP weeks 1, 2, 3 (July 9-29): $475 per exploration
A nonrefundable $100 deposit per exploration is required to guarantee your enrollment; please pay your fee online, by phone, or by mail within 10 days of submitting your online or paper application.

Competitive Scholarship Programs
Available to students completing grades 9-11 only. Women in Engineering and the Engineering Scholars Program have a $295 nonrefundable registration fee (due upon acceptance). Women in Computer Science has a $100 nonrefundable registration fee (due upon acceptance). Rail and Intermodal Transportation is a program with a partial scholarship and is awarded on a first-come, first-served basis. Women in Automotive Engineering has a $295 nonrefundable registration fee (due upon acceptance). Please do not send payment with your application. To complete your enrollment, your registration fee will be due within 10 days of being accepted into the program. You will be notified about acceptance in mid-May.

Available to students completing grades 6-8 only. Junior Women in Engineering has a $295 nonrefundable registration fee (due upon acceptance). Do not send payment with your application. To complete your enrollment, your registration fee will be due within 10 days of being accepted into the program. You will be notified about acceptance in mid-May.

Stay-over fee: $125 per weekend
Stay-overs are available to students registered for two or more consecutive weeks who wish to remain on campus during the weekend. This fee includes room and board, activities, and supervised excursions to local attractions. No stay-overs the weekend of July 1-2.

Early arrival/late departure: $75 per day
This fee includes room and board, supervision, and activities. Students must obtain prior approval from the SYP office. No late departures on July 1 or July 29.

Do you offer financial awards or discounts?
Yes!

Multiple week discount
Students attending more than one week of Summer Youth Programs will receive one $50 award (per child) each summer. Please note the discount on your Payment Form.

Michigan Tech alumni/staff award
Children and grandchildren of Michigan Tech alumni and staff are eligible for one $50 award (per child) each summer. Applied after confirmation is received from Human Resources or the Michigan Tech Alumni Association.

*Discounts and awards cannot be combined, and are not applicable to the Competitive Scholarship Program fees.

Can I cancel my enrollment?
If you cancel your exploration before June 1, 2017, you are eligible for a refund of enrollment fees minus the $100 nonrefundable deposit for each exploration. There are no refunds after June 1.
What happens if my exploration is canceled?
In the unlikely event that your exploration is canceled, we will assist you in selecting another exploration or refund your entire payment, at your discretion.

What if my program is full?
We are always happy to help you find another exploration that fits your interests. Or, if you prefer, we can place your name on a waiting list and notify you if space becomes available. If you haven’t been transferred from a waiting list to an exploration by the start of the program, your entire payment (including the deposit) will be refunded.

Is there recognition for my participation?
Upon completion of your program, you will be awarded a certificate. We recommend you put it in your high school portfolio. You may wish to refer to it when applying for jobs, colleges, or honors programs.

Additionally, following graduation from high school, past participants who enroll at Michigan Tech are eligible to apply for the Summer Youth Scholars Award, exclusively available to SYP alumni who are new incoming first-year undergraduate students.

Visit: mtu.edu/finaid/students/prospective/summer-youth-scholars for details.

After I apply, what’s next?
You will receive a personalized Confirmation Packet once we receive your application and deposit. In it, you’ll find important forms that must be completed and returned. Closer to the start of your program, you’ll receive a Welcome Packet with information about registration, campus life, and what to bring. Keep this packet for your reference as the summer approaches.

How can I contact Summer Youth Programs?
Summer Youth Programs
1400 Townsend Drive
Houghton, MI 49931-1295
syp.mtu.edu
Email: syp@mtu.edu
Telephone: 906-487-2219
Fax: 906-487-1136
Toll-free: 1-888-773-2655

Check the summer youth programs website often throughout the winter and spring—new explorations are added frequently!
Summer Sports Camps at Michigan Technological University

WHAT DOES A CRAZY SMART ATHLETE DO DURING SUMMER?
WORK HARD, LEARN A TON, AND GAIN AN EDGE AT MICHIGAN TECH SUMMER SPORTS CAMPS.

All ages—elementary through high school (grade as of fall 2017; varies by camp)

Sports camps are led by MTU staff, coaches, and student-athletes with guest alumni and professional instructors

SUMMER SPORTS CAMPS
FOR BOYS:
- Basketball
- Hockey
- Mountain Biking

SUMMER SPORTS CAMPS
FOR GIRLS:
- Basketball
- Volleyball
- Mountain Biking
- Hockey
- Soccer
- Figure Skating

Registration opens February 2017 | Camps will fill up—call early to secure your student’s spot!

Commuter and live-in registration options

michigantechrecreation.com
facebook.com/MichiganTechRec
906-487-2975
sportscamps@mtu.edu

Huskies
Can’t decide which program to choose?
Attend more than one!

SYP summer camps and explorations are so much fun, it’s common for students to stay for two or three weeks—some even spend the whole summer here! To help you decide when to attend, we’ve created an at-a-glance calendar listing of all programs. Weekend stay-overs between programs are available for a fee—meals, lodging, and trips throughout the local area are provided. Start planning now, and get ready to have an epic summer!

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3:30 p.m. Program wrap-up
5 p.m. Checkout begins
6 p.m. Block Party
10 p.m. Charter bus departs
9 a.m.-12 p.m. Checkout
Night—Charter bus pick-ups for ESP and WICS
Night—Charter bus pick-ups for SYP
Night—Charter bus pick-ups for SYP 2
Night—Charter bus pick-ups for SYP 3
No late check-outs or stay-overs.
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DON’T BE ORDINARY.

#BEAWESOME