The Enterprise Program
Michigan Technological University

Join an Enterprise
Today’s Topics

• What is Enterprise?
• How Does it Work?
• Teams and Project Examples
• Why Join?
• How to Get Started
• Student & Industry Benefits
• Q&A
Enterprise Mission

The Enterprise Program provides its students with an opportunity to develop their technical, business and interpersonal skills through application of their knowledge and interests to industry-sponsored, multi-disciplinary team-based projects.
Program Objectives

- Gain experience working in a **diverse environment**
- Facilitate the **transition** from undergraduate student to professional work force
- Provide students **ownership** of a portion of their education connecting strongly to their career goals
- Give students a taste of **rewards and accountability** associated with creating new products and working with industrial sponsors
- Encourage multi/interdisciplinary problem solving where **non-engineering issues** also come into play (economical, ethical, organizational, etc.)
How Does it Work?

• Students join an existing Enterprise OR form a new Enterprise (subject to approval)

• Enterprise Teams work in a business-like setting addressing problems of significance to Industry, Government, and Community

• Enterprise teams:
  • develop solutions to industry problems
  • design, prototype, test, and manufacture products
  • manage projects, budgets, schedules
  • develop business and marketing plans
  • recruit, “hire” and train new student “employees”
Enterprise Project Work, under the guidance of a faculty advisor from the Enterprise’s host department
- 1-2 credits per semester for 2 or more years

+ Professional Development Modules, many of which are taught by faculty outside engineering and in a non-traditional format (6-13 credits total)
- 1-credit courses
- Lean/Six Sigma, Design for Mfg., Technology Commercialization, Project Management, Covey’s 7 Habits, Industrial Health & Safety, Ethics, Fuel Cell Fundamentals, …
Levels of Participation

12 credit Concentration available in each engineering program and in most non-engineering programs
- 6 credits of project work
- 3 credits of modules in Teaming and Communications
- 3 credits of elective professional development courses

20 credit Minor in Enterprise presently available to all majors
- 6-7 credits of project work
- 3 credits of modules in Teaming and Communications
- 5 credits of modules in Business related topics
- 5-6 credits of elective professional development courses

**Verify requirements with Academic Advisors in your Department**
Who Can Join?

Motivated, hard-working students...

All majors...

First through fifth year undergraduates...

Graduate students, in select instances...

...You!
Enterprise Teams

Communications

- Cin/Optic Media – audio, video, writing, web design, technical documentation, and other communication support services
- Wireless Communication – wireless, optical, renewable-energy, and biomedical technologies

Environment

- Aqua Terra Tech – ground water evaluation and planning
- Forest and Environmental Resource Management – forest conservation and management
- Green Campus – measuring and mitigating Michigan Tech’s carbon footprint

Technology

- Energy Through Engineering and Construction – low-cost, energy-efficient construction solutions
- Nanotech Innovations – nanotechnology-related products, services, and education

Electronic, Computers, & Robotics

- Blue Marble Security – improving safety and security through the thoughtful use of technology
- FIRST Robotics – robotics, automation technology, and FIRST Robotics team mentoring
- Husky Game Development – design, develop, build, and market games for the video game industry, educational use, and—of course—for fun
- ITOxygen – information analysis, software development, database design, and web-based application development

Materials & Manufacturing

- Advanced Metalworks – production of high quality metal products and development of precision processes and methods
- BoardSport Technologies – innovative wake, snow, and skate board design and manufacturing
- Consumer Products Manufacturing – marketing, prototyping, manufacturing, and distribution of consumer products

Human Health & Interface

- International Business Ventures – creating new products and technologies for people in developing countries
- Humane Interface Design – design, develop, and evaluate interfaces to make daily work more efficient and easier to manage

Vehicle Design & Transportation

- Aerospace – satellite design including guidance navigation, on-board data and command, power, imaging, structures, telecom, systems engineering
- Alternative Fuels Group – alternative energy projects: solar vehicles, biodiesel street sweepers, methanol production, and more
- Automotive Computing – custom hardware/software interfaces to automotive controller area networks; plug-in electric vehicle development
- Blue Marble Security – improving safety and security through the thoughtful use of technology
- Formula SAE Car - Indy-style race car design and competition
- Hybrid Electric Vehicle – full scale hybrid vehicle development and competition
- Supermileage Systems – design and manufacture of a highly fuel efficient competition vehicle
- Transportation – working with government agencies and engineering firms to develop solutions to transportation challenges
- Mini-Baja SAE – off-road recreational vehicle design and competition
- Clean Snowmobile Challenge – snowmobile competition focusing on improvements to emissions, noise, performance, and handling
- Velovations – developing new products and services for the bicycle industry
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- Formula SAE Car - Indy-style race car design and competition
Some Enterprise Projects...

- Clean Snowmobile
- Velovations
- Supermileage Systems
- Blue Marble Security
- Blizzard Baja
- Formula SAE
- BoardSport Technologies
- Advanced Metalworks
- Aerospace

MichiganTech
Work Spaces

- Office and Conference areas
- High-Bay Fabrication area
- Machine Shop
- Research Labs
- In the Field
Benefits of Participation

• **Design and build cool things** - multi-year, hands-on, team-based project experience

• **Practice different roles** – engineering, marketing, leadership, financial, recruiting, etc.

• Develop **valuable skills** employers seek

• **Network** with industry sponsors

• **DIFFERENTIATE YOURSELF!**
Networking with Industry...
Undergraduate Expo
Industry’s Perspective

- Additional project resources
- Fresh perspectives to industry challenges
- Recruiting – teams of students for co-op, intern, and full-time hire needs
- Sponsor visibility and recognition
- Direct involvement in undergraduate education

“I believe that the Michigan Tech Enterprise is a leading program in preparing engineering students with leadership skills, attitudes, and valuable insights to enable rapid personal and professional excellence. I also believe that this program supports a critical U.S. Engineering educational need to prepare students to thrive in the fast paced, rapidly changing environment that is facing all U.S. industry.”

Randy Hill, VP Product & Technology, Kimberly-Clark Corporation
So...Ready to Join?

- **Choose an Enterprise Team** – attend Enterprise team meetings, recruiting events, visit their websites, talk to peers...do your homework to find the best fit

- Check with your **Academic Advisor** to review the Enterprise flowchart for your major

- Some teams require **submitting a resume and meeting with the advisor** before getting approval to join (like a job interview)

- Enroll in the **appropriate section** of the project course...
  - First-year Spring – ENT1960 Lxx
  - Second-year Fall – ENT2950 Lxx and/or ENT2961 (Teaming)
  - Third year ENT3950 Lxx
Where Can I Find out More About Enterprise?

For More Info on…

Enterprise Teams
Faculty Advisors
Curriculum and Courses

www.mtu.edu/enterprise

-or-

Contact the Program Director – mraber@mtu.edu
The Enterprise Program

Questions

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“...arguably the most innovative undergraduate engineering design program in America...”

— F. Nagy, President & CEO, GHSP Inc., retired
In essence, Capstone is:

A team of senior undergraduate engineering students completing an engineering task over the course of two semesters. The team is supported by a team of faculty, experts in their respective fields. The problem is analyzed, the team brainstorms possible solutions, evaluates each on its own merits, then designs, prototypes, and tests the optimum solution. A diverse set of product development and process development types of projects are completed each year. Each team delivers to their customer a full analysis, bill of material
When?
Basic Timing

Capstone Design Program

- **Project Cycle A**
  - ~1 September
  - ~20 April

- **Project Cycle B**
  - ~15 January
  - <15 December

Projects start each September & January
Eighteen teams started their projects last September and will conclude in April.

Another fourteen projects began this January, and will conclude in December.

The cycle repeats in the fall, with another group of projects starting in September.
Why?
In a Nutshell…

- two semester engineering design team project
  - ME, EE, MatSci, ChemEng, BioMed, Civil, Environmental
  - Functional prototype designed/fabricated/tested by team
- projects start each September & January
- Fully staffed support infrastructure — topical experts on call for teams
- integration with summer internships & co-op’s

Build-Your-Own

full Capstone tuition award ➔ MTUDA [MEEM only] = $2000
Enterprise Teams

Department of Mechanical Engineering - Engineering Mechanics