**MTU**engineering

# Michigan Tech Department of Mechanical & Aerospace Engineering

Orientation Department Welcome August 19, 2024









# Introduction to Mechanical Engineering

Prof. Jeffrey S. Allen

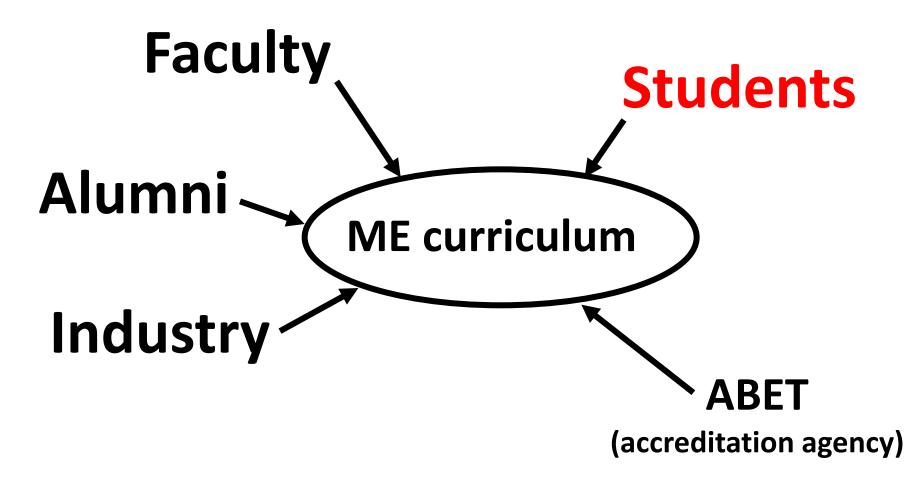
Associate Chair of Undergraduate Studies

## **BSME Program Objectives**

Your Mechanical Engineering Program will prepare you to attain recognition as engineers who:

- Make innovative contributions that positively impact society and the world
- Foster work environments that value diverse viewpoints and enable everyone to work at their highest potential
- Make good engineering, ethical, and financial decisions
- Pursue advanced studies in engineering or other fields
- Take on increasing responsibilities such as managing projects and leading teams

Many stakeholders help ensure the quality of your BSME education



### Your role in your ME program

### Talk to us! Faculty & Staff

Talk to your Peers! ME Student Advisory Committee (MESAC)

# Course Evaluations and Surveys

### **ME Practice Courses**

### **Unique to Michigan Tech**

- Discovery & Experiential Learning
- Other universities looking to adopt our program

### **Mechanical Engineering Practice (MEP) courses**

- Hands-on application of engineering science
- Computer simulations and hardware testing
- Emphasizes teamwork, technical communication, critical thinking, open-ended problem solving, systems engineering, and leadership

# **Two options for "capstone" experience**

#### **Senior Capstone Design**:

Provides you with your "first job" to solve real-world problems sponsored by industry. The entire process flows from concept to development and fabrication to demonstration of a working prototype

- 2 semester requirement
- Teams of 4-6 students
- Direct interaction with industry

#### Enterprise:

Student-led organizations that work in a industry-like setting to solve real-world engineering problems. The projects can last for several semesters and may be industry sponsored.

- 4 semester requirement
- Large teams of students (depending on Enterprise)
- Direct interaction with sponsors
- Current ME focused enterprises: Aerospace, Blizzard Baja, BoardSport Technologies, Clean Snowmobile, Formula SAE, Hybrid Electric Vehicle, Supermileage Systems, Velovations

### **Credit Distributions**

Se	nior Capstone Design Option	Δcr.		Enterprise Option
24	General Education	0	24	General Education
3	Economic Decision Analysis	0	3	Economic Decision Analysis
31	Math and Science	0	31	Math and Science
6	1 <sup>st</sup> Year Engineering	0	6	1 <sup>st</sup> Year Engineering
3	Free Elective	-2	1	Free Elective
4	Senior Capstone Design	+5	9	Enterprise Modules
10	ME Practice Courses	0	10	ME Practice
26	ME Core Courses	0	26	ME Core Courses
3 3	Electrical Engineering Materials Science	0	3 3	Electrical Engineering Materials Science
15	Technical Electives	-3	12	Tech Electives
128 total			128 total	

### **Undergraduate Research**

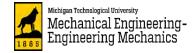
- Faculty hire undergraduate research assistants to help with projects funded by NASA, DoD, Dept. Energy, National Science Foundation, ARPA-E, and industry
- Faculty interests/expertise, research projects, and new grants can be found from the ME-EM webpage
- Experience can include lab experiments, computational experiments, modeling, data analysis, authorship on professional publications
- Can count towards technical electives (or you can get paid)
- Can give you a running start towards an Masters degree

### **Bachelors of Science in Aerospace Engineering**

- Program to begin Fall 2025
- 1<sup>st</sup> Year Courses are the same as BS Mechanical Engineering
- Stay tuned watch for info sessions later this semester

### Too early to think about Grad School?

- Masters degree is 30 credits beyond Bachelors.
- PhD is 30 credits beyond Masters degree.
- Why advanced degrees (MS,PhD) ?
  - Give you specialized knowledge and skills.
  - Opens up job markets and positions not available for Bachelors.
  - Expect ~+20% salary for MS vs BS.



You can complete your BSME and MSME within 5 years!

- Normally a MSME takes ~2 years to complete.
   4 for BS + 2 for MS = 6 years
- Two programs can speed this up
  - 1. Accelerated Masters Program
  - 2. <u>Sr Rule</u>



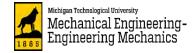
### Accelerated Masters

- Allows qualified students to obtain an MS degree in less time, with fewer credits, and at lower cost than if the BSME and MS are pursued separately.
- You must be accepted into the Accelerated MS *before* BSME graduation with a cumulative GPA of 3.25 or higher.
- Can apply 6 credits from the BSME toward the MS (doublecount credits) – can earn MS with 24 instead of 30 credids



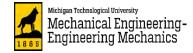
### Senior Rule

- While finishing an undergraduate degree, students are allowed to take courses that can apply to an MS degree up to 6 credits
- A course cannot be applied to both a graduate and an undergraduate degree
- Pay UG tuition for Graduate Courses!
  - Restrictions apply.



### Paying for Grad School

- 1. You can pay your own way (loans, savings, ect)
- 2. Graduate Research Assistantship
  - Work for a faculty on a research project
  - MS-Thesis, MS-Report or PhD options
  - Pays
    - 100% of tuition
    - Stipend (salary)
- 3. Graduate Teaching Assistantship
  - Work for the department to help teach lab courses
  - MS-Thesis, MS-Report or PhD options
  - Pays
    - 100% of tuition
    - Stipend (salary)
- 4. Other options ask

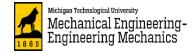


### Interested?

- It is not too early to start planning!!
- Come talk anytime for more details and help planning.
- MEEM Grad Director:

Dr. Wayne Weaver wwweaver@mtu.edu MEEM – 807

 MEEM Grad Program Assistant Mrs. Cindy Wadaga cawadaga@mtu.edu MEEM – 815



# Michigan Tech Mechanical Engineering (ME)

# Orientation Academic Advising Meeting August 19, 2024

# ME Academic Advisors meadvise@mtu.edu

#### **Ryan Towles**

- Michigan Tech grad (1999)
- ME advisor since 2010
- Copper Country Track Club & Keweenaw
   Ultra-Marathon Club Advisor

#### Mark Provoast

- Michigan Tech grad (1987)
- ME advisor since Fall 2022
- Long-time Admissions staff member

#### Sarah Sohlden

- Michigan Tech grad (2000)
- ME advisor since Fall 2022
- Extensive CAD experience

# Agenda

- ME Advising Center
- BSME curriculum
  - General Education
  - Co-curricular activities
- Scheduling/Registration
- Key dates
- University academic policies
- Study tips
- Campus resources
- Opportunities (Career Fair, Involvement)

**ME Advising Center** 8:00 am - 5:00 pm **Monday – Friday** 2<sup>nd</sup> Floor R.L. Smith (MEEM) (Building 20) within Engineering Learning Center (Inside MEEM 203)

906.487.2564

https://www.mtu.edu/mechanical-aerospace/undergraduate/advising/

Walk-in or by email/phone

# Academic advisor's role

- Advising Syllabus use as a guide/checklist for advising
- Assist students with:
  - Developing an academic/educational plan
  - Course scheduling/registration
  - Interpreting University policies and procedures
  - Seeking out services/resources as needed
  - Opportunities: internships, co-op, curricula, study abroad, etc.
  - Refer to faculty as needed for specific professional interests
  - Clarification of career and life goals

We are your primary contacts for questions and concerns and can refer you to the specialists you need if we are not the right resource.

Plan to meet with us at least before registration each semester, but anytime you need to also.

When faced with a difficult question or challenging situation, your academic advisor is always a good place to begin

### Be prepared to meet with academic advisors...

- Know your M number which is not your social security number. It's 8 digits after an 'M'. It is on your Tech ID.
- Bring any previously marked-up flow charts, notes, forms, etc. when you meet with us
  - Create and maintain a personal academic records folder
  - Take notes during advising meetings
- Do not email advisors separately
  - Use <u>meadvise@mtu.edu</u>
  - Use your Michigan Tech email account.
- Michigan Tech has an online directory and A2Z for looking up contact information:

```
https://www.mtu.edu/directory/
http://www.mtu.edu/a2z/
```

• This will save you time if you are just contacting us to find a location, phone number, or email address.

# ME Advising Web Page

https://www.mtu.edu/mechanical-aerospace/undergraduate/advising/

Lot's of FAQs, links, forms...

A good first stop for advising information, see an advisor with questions.

# **Advising Feedback**

Please feel free to come and see us with concerns or to discuss your advising experience. Please understand that advisors don't make decisions. We have to execute university and department policies.

# I heard that...

- If you hear things regarding curricular issues and/or academic policies from a friend, there is a good chance that you have incorrect information. Even though what they are saying may be correct **for them**.
- Verify with an ME Academic Advisor or department responsible for the policy

# MyMichiganTech

- Personal portal for academic information
- Links to BanWeb and many other useful sites
  - Confirm current incoming credits if applicable
- Interactive degree audit
- Guest access
  - Grant through BanWeb scroll to far right
  - Required if you want us to be able to talk to your parents regarding your academic record.

# Canvas

- Learning management system for coursework.
- Most courses will have a Canvas component.
- Be sure to fully participate in your courses.

# BSME degree requirements (Fall 2024)

General Education	24			
Major:				
Chemistry	4			
Electrical Engineering	3			
Engineering Fundamentals	6			
Material Science	3			
Mathematics	19			
Mechanical Eng	40			
Physics	8			
Economic Dec. Analysis	3			
Technical Electives	15 <mark>(6 must be MEEM)</mark>			
Free Electives	3			
Total: 128 credits				
Plus 3 units of co-curricular activities				

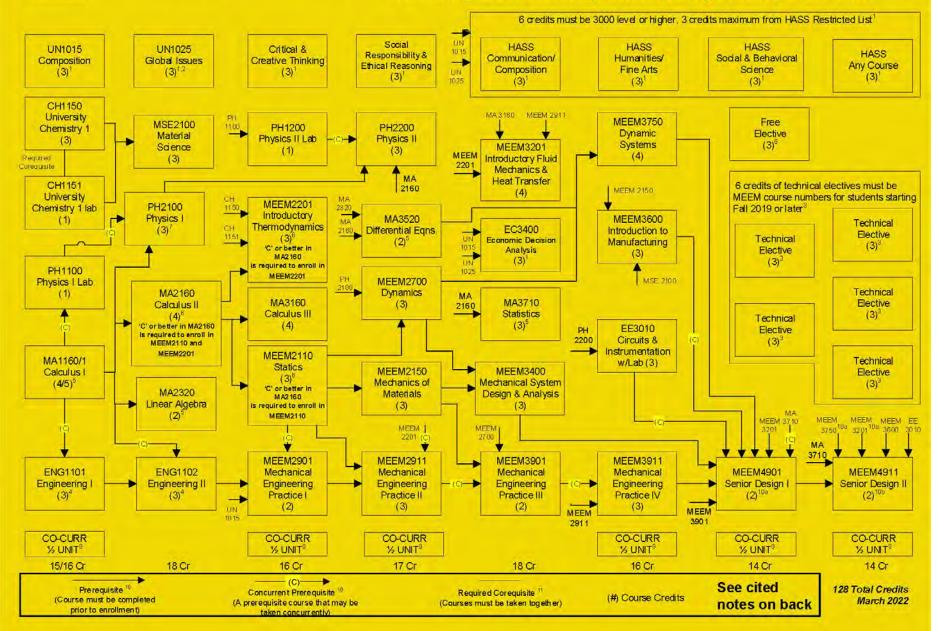
#### Michigan Tech

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#### **Bachelor of Science-Mechanical Engineering**

Sample Course Plan: All required courses are offered each fall and spring semester.

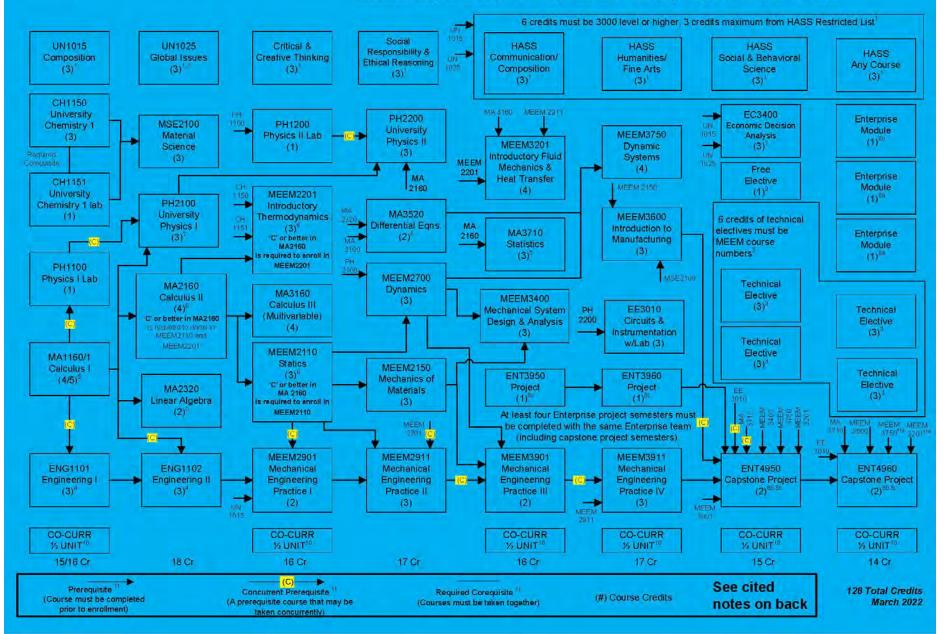
Students may take courses in any semester as long as pre-requisites are met.





#### Bachelor of Science-Mechanical Engineering Enterprise Concentration

Sample Course Plan: All required courses are offered each fall and spring semester. Students may take courses in any semester as long as pre-requisites are met.

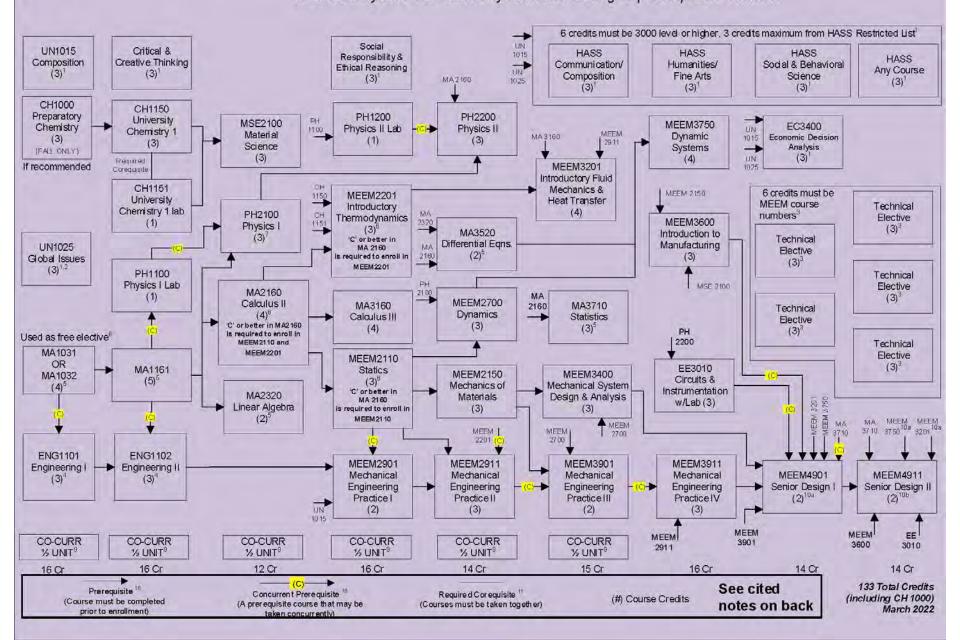




### Michigan Tech

#### **Bachelor of Science-Mechanical Engineering**

For students with math placement below calculus. Sample Course Plan: All required courses are offered each fall and spring semester. Students may take courses in any semester as long as pre-requisites are met.



General Education (24	4 credits)			
UN 1015 – Composition	3 credits			
UN 1025 – Global Issues	3 credits			
(or 3000-level language)				
Critical & Creative Thinking	3 credits			
Social Responsibility & Ethical Reasonin	g 3 credits			
HASS - Communication/Composition	3 credits			
HASS - Humanities/Fine Arts	3 credits			
HASS - Social & Behavioral Science	3 credits			
HASS - Any list	3 credits			
(6 of the above 12 HASS credits must be 3000+ level)				
Co-Curricular-3 units (6 half-units)Co-curricular units are counted towards semester credit totals (tuition total, part of 12 minimum semester credits for full-time student status), but not counted in total credits required for degree.				

# UN 1015 and UN 1025

- First year students are given first priority for scheduling these courses. One most likely added for fall if not previous credit.
- Make every effort to take these in your first year/summer, or transfer them in from another school the first summer.
- UN 1015 is a non-concurrent pre-req for MEEM 2901.
- UN1015 and UN1025 are prerequisites for all 3000-level HASS

# Modern Languages

- Take online placement exam if you have any experience in a language (French, German, Spanish). You may earn extra placement credits for taking your first course
- 3000-level language can replace UN1025 (see advisor to confirm)
- Language courses also count as HASS HU/FA or HASS Any or Free Electives (no double counting if used for UN1025)

## **Critical & Creative Thinking - 3 credits**

- ART1000 Art Appreciation
- ART2195 Art and Flora
- HU2130 Introduction to Rhetoric
- HU2324 Introduction to Film
- HU2501 American Experience in Literature
- HU2503 Introduction to Literature
- HU2538 British Experience in Literature
- HU2700 Introduction to Philosophy
- HU2701 Logical and Critical Thinking
- HU2820 Communication and Culture
- HU2910 Language and Mind
- MUS1000 Music Appreciation
- MUS1140 Popular Songwriting
- SND1000 Sound in Art and Science
- SS1500 Introduction to History
- SS2300 Environment and Society
- THEA1000 Theatre Appreciation
- TA2XX4 Critical & Creative Thinking Core (MTA only)

Semesters/years offered, pre-requisites, attributes, and restrictions, etc. subject to change. Refer to the schedule of classes in BanWeb for current offerings and course descriptions. After satisfying the CCT requirement, additional courses on this list are usable for HASS requirements provided the 6 credits of 3000-level or higher HASS requirement is also satisfied.

#### Social Responsibility & Ethical Reasoning - 3 credits

- EC2001 Principles of Economics
- PSY2000 Introduction to Psychology
- SS2100 Introduction to Cultural Anthropology
- SS2200 Introduction to Archaeology
- SS2400 Introduction to Human Geography
- SS2500 United States History to 1877
- SS2501 US History Since 1877
- SS2502 European History to 1650
- SS2503 European History Since 1650
- SS2504 World History to 1500
- SS2505 World History Since 1500
- SS2600 American Government and Politics
- SS2610 Introduction to Law and Society
- SS2700 Introduction to Sociology
- TA2XX8 Social Responsibility & Ethical Reasoning Core (MTA only)

Semesters/years offered, pre-requisites, attributes, and restrictions, etc. subject to change. Refer to the schedule of classes in BanWeb for current offerings and course descriptions. After satisfying the SRER requirement, additional courses on this list are usable for HASS requirements provided the 6 credits of 3000-level or higher HASS requirement is also satisfied.

# HASS Distribution courses (12 credits)

- Communication/Composition list 3 credits minimum
- 3 credits minimum from Humanities/Fine Arts list
- 3 credits minimum from Social & Behavioral Science list
- 3 more credits that can be from any list
  - No more than 3 credits from HASS restricted list
- Six credits <u>must be</u> at the 3000-level or higher
- See an advisor if you might need to add a CCT/ SRER/HASS course for Fall 2024

#### Co-curricular activities (3 units) Examples...

AF0120 Physical Conditioning	0.5
AF0340 Field Training	1.0
AR2068 Fall Military Physical Conditioning	1.0
MUS1510 Huskies Pep Band	1.0
MUS1511 Campus Concert Band	1.0
PE0101 Flag Football	0.5
PE0104 Ultimate Frisbee	0.5
PE1140 Tennis	1.0
PE2080 Varsity Track & Field	1.0

If you needed to take the ALEKS math placement assessment and did not, then you may have no class schedule.

#### **Math Placement:**

- AP (min score 2 on Calc AB exam)
- ACT/SAT Math
- Transfers
- ALEKS

If this is the case for you, please be sure to take ALEKS as soon as possible.

Current schedule may not be complete if you are not in at least 4 courses (plus labs and PE, etc) and at least 12 credits If needed, add:

UN1015 (email <u>schedule@mtu.edu</u>)

or, UN1025 (email schedule@mtu.edu)

or, CCT or SRER course (see academic advisor)

or, HASS course (see academic advisor)

and/or, Co-curricular unit (recommended, add with OTL)

• Note: Track B courses begin on October 14th

If you are in University Chemistry (CH 1150 & 1151):

You are encouraged to add optional recitation: CH 1153 – 1 credit

If you are in Prep Chemistry (CH 1000) and earned a 'B' or better in high school Algebra and Chemistry (and at least in MA 1031/1032 for this fall), then you may change from CH 1000 to CH 1150/1151.

You may contact Susan Liebau (206A Chem Sci, <u>slliebau@mtu.edu</u>) to discuss.

Email <u>schedule@mtu.edu</u> to change chemistry. Likewise you might need to change from CH 1150/1151 to CH 1000

www.mtu.edu/chemistry/undergraduate/first-year/

- You can move back in the math sequence (e.g., MA 2160 or 3160 to MA 1160/1161 or MA 1160/1161 to MA 1032), but once this decision is made it is final.
- Students may not change cohort classes on their own (MA/ENG).
- Contact the Registrar's Office (<u>schedule@mtu.edu</u>) for possible changes (with good reason).
- Do this ASAP if you need changes.
  - Athletics
  - ROTC
  - Changing Math or Chemistry courses

#### **Success Courses:**

- You may not drop UN 1010 this fall unless you are in UN 1000 also (Learning Communities requirement).
- You may not drop UN 1000 (ExSEL requirement).
- Contact Wahtera Student Success Center for possible section changes if needed (success@mtu.edu).

# Scheduling Other Courses:

- You may not drop HON 1150 (Pavlis Honors College requirement).
- You may not drop KIP 1900 (Athletics requirement).
- If you are declared for an associate's degree in Engineering, that means you have a TIP scholarship.
  <u>efadvise@mtu.edu</u>

CH1150/1151 credit and scheduled for MSE2100 or CH1160/1161?
See an ME Academic Advisor

# Starting in MA1030?See an ME Academic Advisor

**Calculus lab sections have no set times.** 

### **Registration webpage**

Includes video tutorial on how to register for classes

www.mtu.edu/registrar/students/registration/

Registrar's main page also contains links to things like:

- Evening exam schedule
- Final exam schedule
- Academic calendar
- GPA estimator
- Course descriptions
- Schedule of classes (without having to log into BanWeb)
- and more....
- Online (BanWeb) Orientation registration for first-year students is open today at noon through Wednesday at 5:00pm

# **Filled Sections**

Dept.	Contact Person (see complete list)
CH	Susan Liebau – 206A ChemSci (Bldg 19) - 487.2297 - slliebau
MA	Teresa Woods - 205A Fisher (15) - 487.1031 - tmthomps
PH	Wil Slough - 221 Fisher (15) - 487.2273 - wjslough
ENG	Darlene Saari – 112 Dillman (14) - 487.3057 - dfsaari
MSE	Dan Seguin– U101 M&M (12) - 487.3375 - djseguin

## **Transfer Credits**

Official transcripts should be sent to Michigan Tech Transfer Services as soon as the course has been completed. A grade of 'C' (2.00/4.00) or better is required for a course to transfer.

See FAQ #5 on the ME Advising page.

#### **Important dates for Fall 2024**

Friday, August 30 (Wk1) – Last day to add a full semester class.

Wednesday, September 4 (Wk2) – Last day to drop a full semester class with a refund if you drop below 12 credits– Financial Aid credit load established

Friday, September 13 (Wk3) - Last day to drop a full semester class without a grade

Tuesday, September 24 – Fall Semester Career Fair

Monday, October 14 (Wk8) – Mid-term Progress reports available (after 5 pm) and Track B begins

Sunday, October 20 (Wk9) – Spring/Summer Registration begins according to earned credits.

Friday, November 1 (Wk10) – Last day to drop a full semester class with a "W" grade Note: After 5:00 pm on November 3, you cannot drop a full-semester class unless there are clearly extenuating circumstances that prohibit you from completing the course (Late Drop policy). A "W" will appear on your transcript if a late drop request is approved. Late drops are not approved strictly to avoid poor grades.

**November 25-29** – Thanksgiving Break

December 9-13 – Final Exams

#### First-Year Students Adding or dropping a class

During Orientation and Week 1 (through August 30<sup>th</sup>):

 Contact academic advisor and/or Registrar's Office (<u>schedule@mtu.edu</u>) for changes

After Week 1:

- □ Fill out first-year add/drop slip with advisor
- Instructor signature (approval) required to add
- Instructor signature (approval) also required to drop after week 3.
- □ Can replace slip with email approvals.
  - Forward instructor email to advisor for submission.

### **Mid-Term Grades**

- Mid-Term grades of satisfactory or unsatisfactory are assigned for first-year students during the fall and spring semesters.
  - Satisfactory 'SA' = 'C' or better at mid-term
  - Unsatisfactory 'UN' = lower than 'C' at mid-term
- First-year students with 2 or more 'UN' midterm grades are considered in danger of academic probation and must meet with the student success center. Academic advisors will reach out as well.

## Academic probation if:

- After final semester grades:
  - Cumulative GPA is below 2.00, or
  - Most recent semester GPA is below 2.00, or
  - Departmental GPA is below 2.00, based on at least 16 credits of MEEM courses
- Changed (back) to 'good standing' when ALL of the above GPAs are 2.00 or higher
- A student who performs poorly in the Fall 2024 semester will be on probation for Fall 2024 (retroactive)
- All first-year students placed on academic probation should contact an ME academic advisor right away regarding registration for Spring 2025.

# If things don't go well...

- Repeat any grades lower than 'C' as soon as possible (especially MA, ENG, PH, CH, MEEM). Do not move ahead to the next course in a sequence with 'CD' or 'D' grades.
- You must earn a 'C' or better in MA 2160 to take MEEM 2110 or MEEM 2201.
- There may be consequences with financial aid with repeated coursework, so contact that office to discuss your status and options.
- □ Three attempts at a given course. W's do not count.

#### Advising Philosophy - Proper Course Loads

- Part of best-practice time management is taking on proper course loads.
- An appropriate graduation date is the result of appropriate academic planning. Strictly planning to a date can be dangerous.
- Academic performance ought to be your highest priority. Your employment opportunities are best at 3.00 GPA or higher.
- Number of courses can be more an indicator of load than number of credits.
  - Typically, a semester load should be 4-5 courses (plus maybe labs/PE/help, etc) with one of those 4-5 being a general education course if possible.

#### **Time Management**

- How much time is required to be successful in your college studies?
- Good rule of thumb Minimum 2-3 hours of study/prep time for each hour in class
- Typical 15 credit schedule means
   15 class hours + 30 study/prep hours minimum =
   45 hours minimum per week
- □ Use a calendar/planner (paper, phone, online, etc).
- Make a study schedule. Use semester planning.
- Study in a distraction-free environment.

#### MANAGE YOUR TIME WISELY!

#### **Time Log**

- How are you spending your time?
- Keep log for two weeks.
- Analyze your results:
  - Are you sleeping 7-8 hours per night (minimum)?
    - Trying to 'catch up' on sleep on the weekend is not as healthy as a consistent sleep schedule
    - Try to wake up within the same hour each day.
  - Are you getting enough exercise?
  - Are you attending <u>ALL</u> of your classes?
  - Are you studying 30-40 hours per week outside of class time?
- If you have the time, get involved in campus activities, but not over-involved.

#### **Repetitive Study**

- Why does it take this much time to be successful?
- Repetitive study is an effective strategy for good academic performance.
  - Preview material
  - Attend every class
  - Take good notes
  - Review notes and formulate questions
  - Complete homework/practice problems
  - Work on projects/labs as applicable
  - Learning Center appointments/usage
  - Instructor's office hours
  - Study for quizzes/exams

#### Be a Professional Student

- Come to campus and stay on campus.
  - Treat your studies like a full-time job.
  - Have purpose to your study locations and time periods.
  - Go to class, every class.
- Be detail-oriented
  - Check your Michigan Tech email at least daily.
  - Pay attention to communication:
    - Emails especially from instructors, advisors, Wahtera Center for Student Success, Dean of Students, etc.
    - Canvas will be VERY important for your classes.
    - BanWeb Checking schedule, changing classes, checking grades, current GPA, etc. OTLs will get you started.

#### Campus Resources – Use Them!!!

- Faculty (office hours and by appt)
- Learning Centers
  - For all subjects you are studying plus success coaches
  - Weekly appts recommended where available or walk-in
- Dean of Students Office
  - Wahtera Center for Student Success
  - Student Disability Services
- Resident/Commuter assistants
- Upper-class students (with caution)
- Center for Student Mental Health and Well-being (Counseling)
- Career Services
- Academic Advisors (can refer you as needed)
- Further Orientation Sessions

#### **Extra-Curricular Activities**



#### **Enterprise Teams**





#### **Career Services**

- www.mtu.edu/career/events/career-fest/
- Fall 2024 Career Fair Sept. 24<sup>th</sup>
- On-Campus Jobs Expo August 27<sup>th</sup>
- Spring Career Fair (February 2025)
- Internships for Summer 2025 are very appropriate for first-year students. Summer interns may be hired from either semester's Career Fair.

BE PREPARED & GO TO THE FALL CAREER FAIR!

## See you later in the fall...

- Fall first-year academic advising meeting Planned for Mid-October 2024
- Watch your email for meeting notices and plan to attend.
- Will cover spring semester scheduling and registration, longer-term academic planning, important university policies, curriculum and extra-curricular options, and more in greater detail...

#### **ME Academic Advisors**

Ryan Towles Mark Provoast Sarah Sohlden <u>meadvise@mtu.edu</u>

ME Advising Center Inside MEEM 203 906/487-2564

https://www.mtu.edu/mechanical-aerospace/undergraduate/advising/

Your education is the sum of your college experiences, not just the name of your major and the coursework you take.

# We are here to help, but ultimately, your success is up to you!

