Reimagining Education for the 21st Century
Tech Forward Initiative

A Vision for Essential Education
Agenda

1. Undergraduate Student Learning Goals
2. The Essential Education Framework
3. How Essential Education supports credit reductions
4. How Essential Education supports improvements to assessment
5. How Essential Education supports students
6. Resources for Essential Education
Undergraduate Student Learning Goals
Today’s Undergraduate Student Learning Goals

8 goals; 41 performance criteria

Creative & Critical Thinking

Global Literacy

Social Responsibility and Ethical Reasoning

Communication

Information Literacy

Knowledge of the Physical & Natural World

+ Disciplinary Knowledge

+ Technology
Proposed Essential Education Learning Goals

4 goals; 12 performance criteria

Think Critically
Adapt
Communicate
Transform
The Essential Education Framework
Current General Education Framework

Core
12 Credits
- Composition
- Global Issues
- Critical & Creative Thinking
- Social Responsibility & Ethical Reasoning

HASS
12 Credits
- Communication & Composition
- Social/Behavioral Science
- Humanities/Fine Arts
- HASS Elective

STEM
15 Credits
- Math
- Science 1
- Science 2
- STEM Elective

Co-Curricular
3 Units
- PE
- Army/Air Force ROTC
- Band & Music Lessons

STEM Gen Ed (15 credits) can double count toward major requirements

Units not included in GPA and do not count toward overall credits required for degree

39 credits + 3 units of co-curricular = 42
Proposed Essential Education Framework

First Year Experience
16 credits

Distribution Pathway Option
OR
Minor Pathway Option
18 credits

Activities for Well-being & Success
3 credits

37 Total Credits

A 5-credit reduction (plus truth in advertising)
Proposed Essential Education Framework

First Year Experience

1. Michigan Tech Seminar
2. Composition/Read Write Engage
3. Foundations in the Human World
4. Math
5. Natural and Physical Science
6. STEM

Distribution Pathway Option

Minor Pathway Option

SHAPE = Social Sciences
Humanities & the Arts for People
and the Economy/Environment

Activities for Well-being & Success
Proposed Essential Education Framework

First Year Experience

Distribution Pathway Option

OR

Minor Pathway Option

1. Communication Intensive
2. Arts and Culture
3. DEIS (upper division)
4. STEM
5. SHAPE Elective
6. Essential Education Experience (upper division)

SHAPE = Social Sciences
Humanities & the Arts for People
and the Economy/Environment
Proposed Essential Education Framework

SHAPE = Social Sciences, Humanities & the Arts for People and the Economy/Environment

First Year Experience

Distribution Pathway Option

Minor Pathway Option

1. Communication Intensive
2. DEIS (upper division)
3. Minor SHAPE Course
4. Minor SHAPE Course
5. Minor SHAPE Course or Essential Education Experience (upper division)
6. Minor Course (no list restrictions)

Activities for Well-being & Success
Proposed Essential Education Framework

Distribution Pathway Option

First Year Experience
16 credits

OR

Minor Pathway Option
18 credits

Activities for Well-being & Success
3 credits
Proposed Essential Education Framework

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37 Total Credits

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Activities for Well-being & Success
3 credits
New Essential Education Components
What is a Foundations in the Human World course?

- The Foundations in the Human World courses ensure that students have exposure to the arts, humanities, and/or social sciences in the first year, to complement first-year courses in math, natural and physical sciences, and composition.

- Student have a choice of which class to take.
What is an Essential Education Experience?

- An immersive project-based or experiential learning course that leverages, integrates, or expands upon coursework in the pathway.

- Intended to help prepare our students for an ever-changing, dynamic, and diverse world through an experience where the focus is on the application of the knowledge, skills, and perspectives of the SHAPE disciplines.

Option 1: Courses from SHAPE disciplines with a significant civic engagement or service learning component

Option 2: Planned student experiences like faculty led study away or the Pavlis immersion experience.

Option 3: SHAPE curricular course that leverages student’s co-curricular experiences, leadership roles, or other philanthropic activities.
How Essential Education supports credit reductions
What are the double-counting rules?

6 of the 13 Essential Education requirements can be satisfied through the major.

Michigan Tech Seminar

5 other requirements, not restricted by requirement type.
What are the double-counting rules?

Currently, most programs satisfy all STEM components of general education with major requirements. The ability to do so will remain unchanged.

Up to 5 of these can be satisfied by the major.

<table>
<thead>
<tr>
<th>Michigan Tech Seminar</th>
<th>Satisfied by Major</th>
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<tbody>
<tr>
<td>Mathematics</td>
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<td>Satisfied by Major</td>
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<td>Activities for Well-being and Success</td>
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</table>
What are the double-counting rules?

Flexibility in which requirements can be satisfied via major requirements ensures equity across programs and minimizes penalties for students who change majors.

Up to 5 of these can be satisfied by the major.

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<td>Activities for Well-being and Success</td>
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</table>
All programs will have an effective 3-credit savings, leading to “truth in advertising”.

Many programs will have an effective 6-credit savings.
Major Requirements: 86 credits

- CH 1150 (3)
- CH 1151 (1)
- EC 3400 (3)
- EE 3010 (3)
- ENG 1101 (3)
  - or ENG 1001 (2) and ENG 1100 (2)
- ENG 1102 (3)
- MA 1211 (4) or MA 1160 (4) or MA 1161 (5)
- MA 2160 (4)
- MA 2320 (2) or MA 2321 (2) or MA 2330 (3)
- MA 3160 (4)
- MA 3520 (2) or MA 3521 (2) or MA 3530 (3)
- MA 3710 (3) or MA 2710 (3) or MA 2720 (4)
- MEEM 2110 (3)
- MEEM 2150 (3)
- MEEM 2201 (3)
- MEEM 2700 (3)
- MEEM 2901 (2)
- MEEM 2911 (3)
- MEEM 3201 (4)
- MEEM 3400 (3)
- MEEM 3600 (3)
- MEEM 3750 (4)
- MEEM 3901 (2)
- MEEM 3911 (3)
- MEEM 4901 (2)
- MEEM 4911 (2)
- MSE 2100 (3)
- PH 1100 (1) or PH 1141 (1)
- PH 1200 (1)
- PH 2100 (3)
- PH 2200 (3)

Technical Electives: 15 credits

Select a minimum of 6 credits from the following:
Any 4000-level or 5000-level MEEM, non-research course except MEEM4990, MEEM 4901, MEEM4911, MEEM 4959, MEEM5010, MEEM5990, MEEM5994, MEEM5995, MEEM5999

Select remaining credits from the following:

OSM4300 or any 4000-level or 5000-level, non-research course in the College of Engineering except BE4100, BE4900, BE4901, BE4910, BE4930, BES5000, BES5900, CEE4100, CEE4900, CEE4905, CEE4910, CEE4915, CEE4916, CEE4920, CEE4930, CEE4990, CEE5190, CEE5250, CEE5390, CEE5490, CEE5560, CEE5561, CEE5562, CEE5563, CEE5590, CEE5600, CEE5800, CEE5920, CEE5930, CEE5950, CEE5991, CEE5992, CEE5994, CEE5997, CEE5998, CEE5999, CM4000, CM4020, CM4040, CM4060, CM4080, CM4855, CM4860, CM4861, CM4900, CM4910, CM4990, CM5900, CM5950, CM5990, EE4000, EE4800, EE4805, EE4870, EE4901, EE4910, EE5290, EE5805, EE5900, EE5990, EE5991, EE5992, EE5994, ENG4060, ENG4070, ENG4900, ENG4905, ENG4910, ENG4990, ENG5060, ENG5100, ENG5200, ENG5300, ENG5400, ENG5900, ENG5998, GE4000, GE4900, GE4910, GE4916, GE4930, GE4931, GE4933, GE4934, GE4961, GE4962, GE4970, GE5187, GE5830, GE5940, GE5950, GE5960, GE5970, GE5994, GE5995, GE5998, GE5999, MEEM4900, MEEM4901, MEEM4911, MEEM4959, MEEM5010, MEEM5990, MEEM5994, MEEM5995, MEEM5999, MSE4130, MSE4131, MSE4140, MSE4141, MSE4970, MSE4990, MSE5100, MSE5900, MSE5970, MSE5990 and all MET (MMET Department) courses.

Free Electives: 3 credit

Any coursework is allowable, excluding co-curricular and coursework below the 1000-level.
Michigan Technological University Bachelor of Science Degree Audit
Major Program: Mechanical Engineering
Program Code: EME, Academic Year 2022-2023
Total credits required for the degree: 128

**Major Requirements: 86 credits**
- CH 1150 (3)
- CH 1151 (1)
- EC 3400 (3)
- EE 3010 (3)
- ENG 1101 (3) or ENG 1102 (3)
- MA 1121 (4) or MA 1160 (4) or MA 1161 (5)
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- MSE 2100 (3)
- PH 1100 (1) or PH 1141 (1)
- PH 1200 (1)
- PH 2100 (3)
- PH 2200 (3)

**Technical Electives: 15 credits**
Select a minimum of 6 credits from the following:
- Any 4000-level or 5000-level non-research course except MEEM4990, MEEM4901, MEEM4911, MEEM4959, MEEMS5010, MEEMS5900, MEEMS5994, MEEMS5995, MEEMS5999

Select remaining credits from the following:
- OSM4300 or any 4000-level or 5000-level, non-research course in the College of Engineering except BE4100, BE4900, BE4910, BE4930, BE5000, BE5900, BE5930, CEE4105, CEE4900, CEE4905, CEE4910, CEE4915, CEE4916, CEE4920, CEE4930, CEE4940, CEE5190, CEE5250, CEE5390, CEE5490, CEE5560, CEE5561, CEE5562, CEE5563, CEE5590, CEE6000, CEE5800, CEE5920, CEE5930, CEE5950, CEE5991, CEE5992, CEE5994, CEE5997, CEE5998, CEE5999, CM4000, CM4020, CM4040, CM4060, CM4080, CM4855, CM4860, CM4861, CM4900, CM4910, CM4990, CM5900, CM5950, CM5990, EE4000, EE4800, EE4805, EE4870, EE4901, EE4910, EE5920, EE5905, EE5900, EE5990, EE5991, EE5992, EE5994, ENG4060, ENG4070, ENG4900, ENG4905, ENG4910, ENG4990, ENG5000, ENG5010, ENG5200, ENG5300, ENG5400, ENG5950, ENG4000, GE4000, GE4910, GE4915, GE4930, GE4931, GE4933, GE4934, GE4961, GE4962, GE4970, GE5187, GE5850, GE5940, GE5950, GE5960, GE5970, GE5994, GE5995, GE5998, MEEM4990, MEEM4901, MEEM4951, MEEM4959, MEEMS5010, MEEMS5900, MEEMS5994, MEEMS5995, MEEMS5999, MSE4130, MSE4131, MSE4140, MSE4141, MSE4970, MSE4990, MSE5100, MSE5900, MSE5970, MSE5990, MSE5990 and all MET (MMET Department) courses.

**Free Electives: 3 credit**
Any coursework is allowable, excluding co-curricular and coursework below the 1000-level.

**Old: 86 + 18 + 24 + 3 = 131 effective credits**

**New: 86 + 18 + 21 = 125 effective credits**

### General Education Core, Humanities, Fine Arts, and Social Science (HASS) Requirements: 24 credits
Courses used to complete Core and HASS requirements may not be used to complete other degree requirements.
Students must complete 12 credits of Core coursework and 12 credits of Humanities, Fine Arts, and Social Science (HASS) coursework. Repeatability courses may not be repeated for general education credit. Core and HASS courses can be found on the General Education page.

**Core: 12 credits**
- UN 1015 (3)
- UN 1025 or an upper level modern language (3)
- Critical and Creative Thinking (3)
- Social Responsibility and Ethical Reasoning (3)

**HASS: 12 credits, six of the 12 credits must be at the 3000- or 4000-level**
- Communication/Composition (minimum 3 credits)
- Humanities and Fine Arts (minimum 3 credits)
- Social and Behavioral Sciences (minimum 3 credits)
- Any course from the General Education Core, HASS, or Restricted HASS course list [0 to 3 credits]

### Co-curricular Activities: 3 credits
Required for graduation, but not included in the GPA calculation or in the overall credits required for the degree.
Only courses on the co-curricular course list are eligible. Half (0.5) credit courses may be repeated to a maximum of one time for co-curricular credit. Find eligible courses on the General Education page.

### Michigan Tech Experience
- Mathematics Satisfied by Major
- Natural & Physical Sciences Satisfied by Major
- STEM Satisfied by Major
- Communication Intensive 3
- Arts & Culture 3
- DEIS 3
- STEM Satisfied by Major
- SHAPE Elective Satisfied by Major
- Essential Education Experience 3
- Activities for Well-being and Success 3
How Essential Education supports improvements to assessment
How does Essential Education change USLG assessment?

- Fewer goals and performance criteria to manage
- More instructor choice in performance criteria to assess (only one in most courses)
- Two leadership teams engage faculty in conversations and provide help resources
- Student Learning Summit
- ePortfolio provides curated student artifacts and reflection that can be used to supplement instructor-based and programmatic assessment
How does this proposal set the stage for streamlined program assessment?

We believe the undergraduate student learning goals are the purview of general education upon which disciplinary programs can build.

We do not expect these USLGs to be imposed on disciplinary programs.

“The Interim Provost and the Associate Provost for Undergraduate Education have stated that they are committed to an ongoing evaluation and revision of the university's overall assessment structures to make them more efficient while producing meaningful and actionable data that can be used to improve programs and student learning.”
How Essential Education supports students
How does Essential Education support student outcomes and satisfaction?

<table>
<thead>
<tr>
<th></th>
<th>High Impact Practices</th>
<th>Increase student learning, retention, and satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Michigan Tech Seminar</td>
<td>Supports high school to college transition to support first to second year retention</td>
</tr>
<tr>
<td>3</td>
<td>Activities for Well-being and Success</td>
<td>Supports student mental and physical health which in turn supports retention and satisfaction</td>
</tr>
<tr>
<td>4</td>
<td>Minor Pathway</td>
<td>Makes earning a minor accessible to all students without increasing cost or time to degree</td>
</tr>
<tr>
<td>5</td>
<td>ePortfolios</td>
<td>Helps students synthesize, integrate, and communicate their learning</td>
</tr>
</tbody>
</table>
How does Essential Education support advising?

- Reduces bottlenecks in Essential Education program
- Provides themed lists of courses to help students choose courses that are more meaningful to them.
- For students who opt for an Essential Education Minor, the offering departments will provide support with minor advising.
Resources
Resources for Essential Education

1. Start-up Costs

2. Infrastructure Enhancement

3. Steady-State Operational Costs

“The effort of the faculty, staff and students represented in this proposal is impressive. The outcome is important and if approved, we are committed to help it succeed at its aspirational level.”

- President Koubek