

The University Senate of Michigan Technological University

Proposal 18-23

(Voting Units: Academic)

Proposal to Revise General Education Requirements (Essential Education) for Bachelor Degrees

1. Basic Program Information

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Proposed by IDEAhub and the Essential Education Implementation Committee:

- Jared Anderson, Chair, Visual and Performing Arts
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- Travis Wakeham, Assistant Teaching Professor, Academic Advisor, Biology

Program type: General Education

Program Title: Essential Education

Planned Implementation: Fall 2025

Program modality: on-campus

Target student population: current enrollment shift

General description and characteristics of program

Essential Education is:

- An opportunity for Michigan Tech to become a national leader and innovator in educating and preparing students to be leaders in the Fourth Industrial Revolution
- A forward-thinking curriculum that prepares students for a future where opportunities and careers might currently be unimagined
- A structure that further aligns our undergraduate curriculum with [business workforce needs](#) and enhances our students' career opportunities
- An integrated curriculum where students take ownership of their learning in and out of the classroom and are able to apply it to the complex challenges faced by a diverse and rapidly changing technological society

In the Essential Education program, all Michigan Tech students will:

- Build foundations of knowledge through a broad set of courses in both STEM and SHAPE¹ fields.
- Begin developing 21st century skills like communication, collaboration, and self-reflection in their very first year on campus as they develop a sense of belonging and map out their Michigan Tech journey.
- Think deeply and broadly about the big questions of our time through their pathway courses—applying the tools and insights of multiple disciplines to become agile, culturally-aware, and creative thinkers.
- Engage in the following [high impact practices \(HIP\)](#), known to increase student learning, satisfaction, and retention: first year seminars, writing intensive courses, diversity/global learning, community-based learning, and ePortfolio.

Rationale / Description of the Proposed Changes

In fall 2018, at the behest of newly-appointed Michigan Tech President Richard Koubek, the Michigan Tech community gathered at several forums to discuss the Michigan Tech student and graduate of the future. These conversations centered around the skillsets students would need to succeed and ways the current curriculum and structure of undergraduate education would need to change to more effectively develop these skills. As a result of these forums and other discussions related to inclusivity, research, and wellness, nine Tech Forward initiatives were announced. One of these initiatives, Education for the 21st Century (originally led by Dr. Lorelle Meadows, followed by Dr. Mary Raber), addresses how best to develop students who can lead inclusively, communicate with a wide range of audiences, learn collaboratively, and use their technical skills with agility in addressing complex problems.

Michigan Technological University excels in providing the technological education that is needed for the future. But technical skills alone will not help our graduates reach their full

¹ SHAPE = Social Sciences Humanities & the Arts for People and the Economy/Environment.
<https://www.thebritishacademy.ac.uk/this-is-shape/>

potential. [In today's rapidly-changing world of employment](#), many 21st century learners will be working in positions that do not currently exist, using tools that have yet to be invented, and solving problems that are at the intersection of the human, digital, built, and natural worlds.

As educators, it is our responsibility to ensure that our students are prepared to enter and succeed in this changing world – to have the skills to become culturally-responsive leaders who are civically engaged. This line of thinking is at the heart of Essential Education, a core component of our Tech Forward vision. The new program name, “Essential Education,” signals that the skills, abilities, and mindsets facilitated by a broad education in the foundational disciplinary areas of the sciences, math, social sciences, arts, and humanities are essential to students’ educational and professional development.

The proposed Essential Education program supports Michigan Tech’s strategic initiatives by:

- building 21st century skills sets that are critical for our students to become leaders who can respond to the increasingly frequent technological changes impacting our economy and society.
- ensuring that all students engage in high impact practices that support retention and student success.
- proposing new learning goals that support more meaningful and streamlined assessment of general education and that set the stage for changes in 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.
- working to reduce credit burdens for our students by reducing the number of credits in the general education component and increasing double counting opportunities with major requirements.
- opening new marketing opportunities (through the Essential Education minors and the Essential Education Experiences) that are aligned with Michigan Tech’s brand and help us tell our story to a new generation of Huskies.

Essential Education complements and builds upon our established strengths as a flagship technological university and allows students to maximize the return on their investment in a Michigan Tech education.

Related Programs

The proposed Essential Education program has been designed to work with the Michigan Transfer Agreement (MTA) and fit Michigan Tech’s unique context and needs. During the course of its development, however, programs at various institutions have served as inspiration for its various components:

Essential Education Experience:

- Worcester Polytechnic Institute’s integrative, [project-based undergraduate curriculum](#);
- Rensselaer Polytechnic University’s [The Arch International Opportunities Program](#).

An interdisciplinary approach to general education:

- Pavlis Honors College's [Honors Pathways Program](#);
- The Colorado College [Block Plan](#);
- [Purdue's Cornerstone Program](#);
- Clark University's [Liberal Education and Effective Practice \(LEEP\) Program](#);
- James Madison University's [X-labs program](#).

Learning Goals and ePortfolios, informed by team participation in the AAC&U Institute for General Education and Assessment (2021) and AAC&U Institute on ePortfolios (2022):

- Jefferson University's [Hallmarks Program](#);
- Stanford University's [Integrative Learning Portfolio Lab](#)

Although many of the high impact practices we have included in Essential Education have been piloted at smaller, private institutions, more recent general education revisions at public 4-year institutions like [The Ohio State University](#) demonstrate that these practices are possible on a larger scale. Adopting the Essential Education program gives Michigan Tech the opportunity to be leaders in curricular change to promote student success, retention, and satisfaction.

Projected Enrollment

Students currently enrolled may complete the general education program as described on their audit year. All baccalaureate degree-seeking students enrolling Fall 2025 or later will take part in this new Essential Education program.

Specialized Accreditation / Licensure Requirements

No specialized accreditation or licensure is needed for general education. The proposed program meets minimum requirements set by the Higher Learning Commission.

2. Curriculum Details

Learning Goal Framework

Michigan Tech students will be able to develop innovative and ethical solutions to challenges faced by a diverse and rapidly changing technological society.

This vision and its component goals and performance criteria (Table 1) were derived from multiple, campus-wide brainstorming sessions about what our students need to succeed and represent the main traits we would like graduates of Michigan Tech to embody.

“Measure what you value; don't value what you can easily measure.” – Andy Hargreaves²

² Andy Hargreaves: <https://www.andyhargreaves.com/press--news.html>

The aim of the learning goal framework is to help with the integration of student learning across the Essential Education program and undergraduate learning in general. The proposed set of undergraduate student learning goals focus on foundational and cross-cutting skillsets and mindsets. They are similar in both number and scope to those at our peer institutions.

The proposed learning goal framework reduces the number of undergraduate student learning goals from eight to four and the number of performance criteria from 41 to 12.

Reducing the number of goals and performance criteria ensures coverage across the Essential Education curriculum while reducing the number of criteria assessed in each class and providing faculty with more flexibility in which criteria are assessed in their courses. A smaller set of performance criteria allows us to target our assessment and continuous improvement efforts on a set of the most important student outcomes.

The proposed learning goals do not include disciplinary knowledge, in contrast to Michigan Tech’s current set of USLGs. This exclusion is deliberate, as undergraduate student learning goals are meant to be the purview of general education upon which disciplinary programs can build. Moving away from the discipline-specific learning goals sets the stage for providing clearer differentiation between assessment of the general education program and assessment of disciplinary programs that already have their own set of learning goals and assessment protocols, in many cases set forth by an external accrediting agency. For more information on the intended relationship between these goals and degree program assessment, please refer to the appendix³ (see [Vision Document](#) pg 20-21).

Table 1: Breakdown showing the proposed Goals and Performance Criteria (see [Vision Document](#) pg 6)

Goal	Essential Abilities: Performance Criteria
Think Critically	Question Assumptions
	Evaluate Information
	Analyze Ethical Implications
Communicate	Communicate Quantitatively
	Communicate Contextually
	Foster Collaboration
Adapt	Reflect
	Welcome Challenge

³ The appendices are not part of the senate proposal. They are provided as background information to aid in its evaluation.

	Explore Diverse Perspectives
Contribute/Transform	Engage in Civic Life
	Innovate Solutions
	Create

Assessment Plan

The proposed assessment plan for the Essential Education program will use instructor assessment and course group assessment (a process similar to what is currently in place for assessment of Goal 2 at the course level and has been successfully piloted by Goal 4 and 5 instructors).

Assessment will be supplemented by evaluation of sampled reflective portfolios created through each students' path through the Essential Education Program. Assessment processes within Essential Education will be overseen and modified by the Essential Education program administration team, charged by the provost to facilitate continual improvement of student learning.

Curriculum design

Total credits: 37

All course requirements will be selected from lists of approved courses.

16 credit core:

- 1 credit: Michigan Tech Seminar list
- 3 credits: Composition-focused course (e.g., UN1015)
- 9 credits STEM:
 - 3 credits (min): Math list
 - 3 credits (min): Science list
 - 3 credits (min): STEM list
- 3 credits: Foundations in the Human World ("Foundations") list: 1000 or 2000-level course in the SHAPE disciplines⁴

18 credit pathway:

Distribution Pathway

- 3 credits: Communication Intensive list
- 3 credits: Arts and Culture list
- 3 credits: DEIS list (3000-4000 level)
- 3 credits: STEM list
- 3 credits: SHAPE list
- 3 credits: Essential Education Experience (**E**³) list (3000-4000 level)

OR Essential Education Minor Pathway

- 3 credits: Communication Intensive list
- 3 credits: DEIS list (3000-4000 lvl)

⁴ Social Sciences Humanities & the Arts for People and the Economy/Environment. See [Vision Document](#).

- 3 credits: minor course from SHAPE list
- 3 credits: minor course from SHAPE list
- 3 credits: Minor elective⁵
- 3 credits: Essential Education Experience (**E³**) OR upper-level minor course from SHAPE list (either option at 3000-4000 level)

3 credits from Activities for Well-being and Success (“Activities”) list

NEW Course Descriptions

None.

Model schedule

	Year 1	Year 2	Year 3	Year 4
Core (16 cr)	Seminar, Math, Composition, Science, STEM, Foundations.			
Distribution (18 cr)	18 cr Distribution Pathway Courses or Essential Education Minor			
Activities (3 cr)	3 cr Activities for Well-being and Success			

Figure 2: Outline of the Essential Education program requirements.

Faculty Qualifications

All faculty employed to teach Essential Education courses will have appointments with an appropriate academic unit, disciplinary expertise, and will meet or surpass the basic qualification requirements for their appointment rank.

Program-specific policies

- **Overlap with major requirements:** The Michigan Tech Seminar and up to 5 Essential Education Components may be satisfied by major requirements and would be marked as “met by degree requirements” (or similar language) on degree audits.
 - Courses already included in existing major degree requirements that are also on the Essential Education course lists can be used to satisfy Essential Education requirements without additional approvals.
 - Majors that wish to change their degree requirements to include specific courses or choice points to satisfy an Essential Education requirement must seek approval from the course’s offering unit. This is consistent with the standard practice for proposals for new programs that expect the proposing unit to

⁵ Minor electives can be from outside SHAPE and STEM lists as long as the course is open to all students and only includes prerequisites that can be completed as part of Essential Education.

demonstrate approval for the inclusion of any courses from outside their own unit.

- Programs may not dictate students' Essential Education minor or elective choices, beyond the fact that some major courses may also satisfy Essential Education or Minor requirements.
- In the effort to reduce the credit burden on our students, programs shall not use the credit reduction between the general education and Essential Education programs as an opportunity to add credits to their degree totals, except in those cases where the revision will bring the total number of degree credits below the 120-credit minimum. This does not preclude future, well-reasoned, curricular changes that impact degree totals.
- Approval of all changes to degree requirements, which are initiated by the degree program, will be in accordance with established practices and procedures.
- Proposed rules for inclusion for course categories are included in [Appendix E](#) to demonstrate the initial working definitions and operational intent of the proposing committee. These are not included in the formal senate proposal to allow flexibility for future innovation and to ensure that specific definitions and rules can be adapted to address concerns that emerge through the first several years of implementation of the program. Course lists and rules for inclusion will be overseen by the Essential Education program administration team with approval from the provost (or their designee).
- As it is expected by our institutional accreditor that assessment practices lead to program changes in an effort to improve student learning, structural updates to the Essential Education program may be completed through the annual curricular update process, as used by other academic programs on campus, with the limit that no more than 10% of credits (4 credits, rounded up) may change compared to the senate-approved program without additional senate approval. Such changes would only occur with the approval of the Essential Education program administration team and the provost (or their designee).
- The proposed learning goals and Essential Abilities may evolve over time as part of assessment-driven continuous improvement. Such changes would only occur with the approval of the Essential Education program administration team and the provost (or their designee).

Program Administration

The Essential Education Program will be overseen by the Office of the Provost, who will assemble a team of representative stakeholders to provide guidance for the interpretation and continuous improvement of the curriculum. This team will work with the associate provost to evaluate all proposed revisions to the Essential Education curriculum for consistency with the philosophy and goals of Essential Education.

Course and Minor Approvals:

- Courses currently on the HASS, HASS restricted, STEM, and STEM restricted lists will be automatically included in the Essential Education lists. During the implementation phase, individual departments/units will be asked to determine which Essential Education designators are appropriate for their courses (for example, Foundations in the Human World, Communication-intensive, DEIS, Arts and Culture) based on rules for

inclusion provided by the associate provost and the Essential Education implementation team. Lists developed by departments/units will be reviewed by the associate provost and the Essential Education implementation team.

- New courses may be proposed for inclusion in the Essential Education program by following procedures outlined by the associate provost and the Essential Education program administration team. At a minimum, this procedure will include a course description, syllabus, and declaration of which Goals/Essential Abilities the course intends to support and assess.
 - Courses that are not offered on a regular basis or whose assessment results over time do not demonstrate that the course is meeting its learning goals may be removed from the approved list of Essential Education courses.
- In addition to the requirements for inclusion in Essential Education, minors must follow all normal senate policies and procedures related to minors.
 - The Essential Education program administration team will approve requests for an existing or proposed minor to be included in the approved minors list.
 - Units proposing new Essential Education minors should work with the Essential Education program administration team as part of the proposal development phase to ensure that the following considerations are met:
 - Essential Education Minors should be interdisciplinary, with courses representing multiple disciplinary perspectives on cross-cutting themes (e.g. sustainability, health and well-being, social justice, entrepreneurship). A minimum of 6 credits ($\frac{1}{3}$ of the overall minor credits) must come from outside of the proposing department.
 - Essential Education Minors are intended to provide breadth to a student's overall academic journey. Accordingly, Essential Education Minors in a given department will typically be restricted from students majoring in the same department. Proposing departments may apply for an exemption to this rule if they demonstrate that there is not significant overlap (more than 6 cr.) with existing major course requirements. For example, we envision Essential Education Minors related to Modern Languages would be open to all majors.
 - Essential Education minors that do not include an Essential Education Experience must require the submission of a showcase ePortfolio. Mechanisms for recording the completion of the ePortfolio will be implemented by the Registrar's Office.
 - Essential Education minors must designate choice points within the minor in a way that ensures all students will meet the Essential Education minor requirements.
 - Courses/choice points included in the proposed Essential Education minor must have the capacity to accommodate likely student enrollment.
 - Minors must be designed so it is possible to complete them in no more than three years. Offering units should demonstrate this ability by indicating semester offerings and capacity. Consideration should be given to any courses that are offered in alternate years only.

- Minors proposed as Essential Education minors should not have substantial overlap with other Essential Education minors. In an effort to maintain a curated list of Essential Education minors with clearly distinguished objectives, and to avoid student confusion, the program administration team will consider overlap between minors as part of the approval process.
- During the implementation phase, the Essential Education implementation team will work with units interested in developing Essential Education minors.

Library and Other Learning Resources

No additional library resources would be needed.

Suitability of Existing Resources

No additional space or specialized equipment will be needed.

Program costs

There are at least three categories of spending necessary to achieve a successful launch of the Essential Education program by fall 2025:

1. **Start-up Costs:** As with other Tech Forward investments made on campus, there will be start-up costs to support faculty and staff for efforts beyond the usual and customary activities to develop, pilot test, and implement this new program. We outline below a summary of these costs. President Koubek has indicated that he sees these one-time implementation costs as an augmentation of the initial Tech Forward investment in Education for the 21st Century.

2. **Infrastructure enhancement:** We anticipate that there will be support system updates needed around campus to be congruent with the high level of delivery being proposed. This will likely include software upgrades in the Registrar's office to enhance student degree planning and degree audit reporting as well as a subscription to an ePortfolio platform. The implementation of this new curriculum provides the impetus to make these investments at this time. President Koubek has indicated his support for this infrastructure investment, which is beyond the scope of this proposal.

3. **Steady-State Operational Costs:** Steady-state operational costs will be addressed in the larger context of the university's budget process in order to ensure sustainable support for Essential Education that meets the highest levels of pedagogical standards. As per President Koubek: "Budgeting and reallocation exercises for campus-wide programming occur at a university-wide level and are always an ongoing process. Supporting this project will be worked into the normal budget development/reallocation process as necessary to assure resources are there to achieve success."

Start-up Costs

The successful launch of Essential Education in Fall 2025, with full scale delivery by Fall 2027, will require funds to support the following:

- Course development grants (buyouts/summer pay): Michigan Tech Seminars and Essential Education Experiences (\$278k)
- Essential Education Minor development grants (buyouts/summer pay): (\$44k)
- Buyouts/summer pay for working groups: (\$206k)
- Advising workshops: advisor stipends and event costs (\$40k)
- ePortfolio piloting: 200 accounts/year (\$10k)
- Project management: (\$173k)
- Temporary staffing for the registrar's office to support encoding of the new program (\$158k)
- Buyouts/summer pay for implementation team leadership: (\$48k)
- Marketing: internal and external communications, materials for recruiting, website (\$200k)

We expect that total start up costs will total approximately \$1.2 Million over 4 years.

Infrastructure enhancements

Implementation of the new program requires enhancements of Michigan Tech's technological infrastructure, including the procurement of an ePortfolio platform to support the use of ePortfolios as a high impact practice to support student learning and supplement assessment. We also strongly recommend the procurement of an integrated degree planning and course demand planning system as part of the transition to Essential Education.

Software: ePortfolio Platform

- To support student integration of learning and reflection throughout the curriculum as well as enhanced opportunities for meaningful assessment, we recommend a subscription to an ePortfolio platform. All Michigan Tech undergraduate students and faculty would have unlimited access to the platform, and for the single subscription price, they could create multiple ePortfolios (perhaps for major capstone projects, career preparation, job searching) in addition to their use in Essential Education.
- Implementation-year estimated cost would be \$21,000 based on 2000 student accounts. Annual cost would rise as the number of students in Essential Education increases. Based on 6000 users, the annual cost is estimated at \$52,500 per year. Faculty and alumni accounts are provided free of charge. A limited pilot would cost \$4,800/year for 200 accounts and is included in the expected start-up costs.
 - The cost of this software could be covered by a \$10/year student fee or equivalent course fees. It is a resource students can keep after graduation if they choose.

- The cost per account drops to \$9 with 5000 or more users. Any fees collected in excess of the annual subscription cost will fund ePortfolio support in general and related professional development opportunities for faculty.

Integrated degree planning (audit) and course management software

- Michigan Tech currently subscribes to u.achieve as a degree audit tool. With subscription fees around \$10-15k/year, this is a low-frills audit system that provides limited ability for students to plan their schedules or simulate the effects of changing majors. Importantly, u.achieve has no ability to simulate the effect of adding or changing a minor, a function that would greatly support advising of Essential Education minors. Moreover, the system does not support course demand planning, leaving departments to plan only based on past enrollment trends.
- Integrated software solutions are available to support both degree planning and course demand planning. Subscriptions to these systems typically cost approximately \$100k per year. Adopting a more advanced system with improved usability would increase student satisfaction and reduce bottlenecks in advising by providing students with robust course planning tools. Despite the increased subscription costs, there is potential for overall cost savings across the university.
 - Subscribing to a cloud-based system would reduce IT responsibility and upgrade time/costs.
 - Improved system usability would make it easier for the registrar's office to encode courses, saving personnel time.
 - The ability to simulate the effect of selecting among Essential Education minors will reduce demands for additional advising resources.
 - The ability to forecast demand for certain courses (and certain minors) will allow units to distribute resources more intentionally and make hiring decisions proactively, reducing bottlenecks and reliance on last-minute hires to meet general education course demands.
- Adoption of a more integrated degree planning and course management system is a matter of when, not if. We recommend that an investment is made in these software systems in coordination with the implementation of the Essential Education program to ensure that the registrar's office does not need to re-encode the system twice, once in u.achieve and then later in a more modern system.

Steady-state operational costs

To realize the promise of the Essential Education program requires both an initial investment of resources and sustained support to ensure that we have the faculty in place to deliver these programs and meet the capacity that comes with growing enrollment. Essential Education should be delivered on a model that relies primarily on full-time faculty to ensure that students have high quality instruction in the first year by faculty who understand and are invested in Essential Education.

We anticipate the following on-going program costs:

Faculty Lines

- To ensure program success, an increase in budget allocation for instruction should include several strategic hires in Essential Education to reduce our dependence on adjunct instruction to meet capacity demands. Additional hires to support Essential Education instruction will be needed as Michigan Tech's enrollment grows.
 - Currently, annual budget allocations do not fully cover the demands of general education courses. To provide enough capacity, the annual budget allocation is supplemented with funds from other sources, including summer tuition returns.⁶ Eight faculty hires are required simply to replace current general education instruction delivered by temporary faculty funded by other means.
 - The transition to Essential Education will require at least similar teaching capacity to the current system, though some realignment of resources may be needed to deliver the new program effectively.
 - Growth to any undergraduate program anywhere on campus demands growth in our capacity to teach Essential Education. Commitment to ensuring maintenance of and increases in resources as the student body grows is necessary to ensure that the promise of Essential Education is fully realized for all students. As the Essential Education minors grow in popularity, enrollment in those minors should be used as one of the metrics that informs decisions regarding where teaching capacity is required.

Program Staff Support

- Program Director. Given the large number of responsibilities currently assigned to the Associate Provost for Undergraduate Education, we recommend the formation of a position of Program Director for Essential Education. The details of this position would be determined by the Office of the Provost, but might include involvement in administration of the Essential Education program and pursuing grant funding to support curricular innovation through sources such as NSF DUE, S-STEM, IUSE; NEH or NEA funding; foundations such as KEEN, etc. We envision this role as a faculty line, with a 0.5 FTE allocation to Essential Education, similar to the model used in Purdue's Cornerstone program.
- Integrative Learning Support. To get the most out of our High Impact Practices, we recommend the creation of a faculty position for integrative learning support. We envision this as a .5 FTE reallocation of a current instructional track faculty position to support Essential Education. This person should be involved in the pedagogical oversight of at least one Essential Education Experience course. This position would support faculty development in ePortfolio pedagogy, coordinate resources for faculty and student ePortfolio use, support ePortfolio assessment-related needs, and facilitate continuous improvement stemming from assessment results.

⁶ For example, the College of Sciences and Arts spends approximately \$1.2 million annually on temporary instruction. Over half of these expenditures support general education instruction, with funding drawn from sources outside of the annual budget allocations for salary and fringes.

- Essential Education Experience Coordinator. We propose the creation of a new full-time staff position dedicated to coordinating community engagement and programmatic efforts related to the high-impact Essential Education Experiences, including faculty-led study abroad.
 - To ensure positive university relationships with local communities and organizations, (including protecting partners from research/engagement fatigue) it is critical that communication is coordinated and centralized to avoid overwhelming these partners and to maintain institutional awareness of the number and nature of requests. We expect that this position would also coordinate with other Michigan Tech offices that engage in outreach activities.
 - The Essential Education Experience Coordinator will facilitate faculty who aim to collaborate to design and deliver cross-cutting high impact E³ experiences for students. This will include coordinating with departments when courses are co-taught or need to be co-scheduled, making travel arrangements, setting up meetings for external partners, managing finances of E³ experiences.
 - Currently, faculty-led study abroad coordination is spread across several units without a clear mechanism for faculty collaboration and support or a strategy for promoting student awareness of the range of study-away options at Michigan Tech. Developing a single, centralized position could be seen as a cost-saving reallocation of resources.

Suggested External Support

- Writing Center: We recommend the allocation of additional funds to allow the Michigan Tech Writing Center to provide support for ePortfolios and Writing Across the Curriculum for both faculty and students. Writing Center peer tutors can help support student reflection in the Essential Education curriculum and some ePortfolio mechanics. Already, faculty are increasingly using the Writing Center for help with issues related to Writing Across the Curriculum but the center is not currently funded to support this. This is a current unmet need and this will only increase with the proposed changes.
- Humanities Digital Media Zone (HDMZ): We recommend the allocation of funds to support regular workshops to support students in the design and visual communication aspects of the ePortfolio. Some of the expected student fees related to ePortfolio could go to support the Writing Center and HDMZ as ePortfolio use grows.

Additional Program Support Costs

- On-going internal training suggested through a periodic Lunch n' Learn model.

Use of Resources Currently Allotted to General Education

- Resources currently used by the general education program for assessment processes will be reallocated to Essential Education: staffing, stipends for assessors, and administrators.

- Teaching: many courses will continue with minimal changes. Some teaching responsibilities currently associated with Global Issues will be reallocated to support new offerings in Essential Education.

Financial Information for Senate Finance Committee (108.1.2)

1. Relation to University Strategic Plan
 - a. Relation of program to the university's educational and research goals.
 - i. The proposed Essential Education program supports Michigan Tech's strategic initiatives by:
 1. building 21st century skills sets that are critical for our students to become leaders who can respond to the increasingly frequent technological changes impacting our economy and society.
 2. ensuring that all students engage in high impact practices that support retention and student success.
 3. proposing new learning goals that support more meaningful and streamlined assessment of general education and that sets the stage for changes in 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.
 4. working to reduce credit burdens for our students by reducing the number of credits in the general education component and increasing double counting opportunities with major requirements.
 5. opening new marketing opportunities (through the Essential Education minors and the Essential Education Experiences) that are aligned with Michigan Tech's brand and help us tell our story to a new generation of Huskies.
 - b. Consistency with the university's resource allocation criteria.
 - i. This Essential Education proposal is the result of one of the Tech Forward Initiatives and is therefore aligned with Michigan Tech's institutional strategic priorities that should guide university resource allocation.
2. Impact on University Enrollment
 - a. Projected number of students in the program.
 - i. All new undergraduate students would participate in this program. With a university goal of reaching 8000 undergraduate students by 2035, it is expected that enrollment may increase by 45 new students per year. As the proposed program implements a number of high impact practices known to support retention, we anticipate that this new program will support university efforts to increase retention.
 - ii. Source of new students; in particular, will the students be drawn from existing programs, or will they be students who would otherwise not have come to MTU? Not Applicable
 - b. What is the likely correlation between demand for the new program and existing enrollment patterns at MTU?

- i. Essential Education will serve nearly all Michigan Tech students. (The exception is students who come in having satisfied the full MTA.) The Essential Education program is aligned with Michigan Tech’s identity as a flagship technological university that prepares students to be leaders in the Fourth Industrial Revolution. The Essential Education minors and Essential Education Experience are both well aligned with the wants and needs of the “New Husky,” students that are self-directed, pragmatic, creative, future-oriented, altruistic, and focused on self-optimization.⁷ These elements of the Essential Education program add value to Michigan Tech’s major programs, maximizing students’ return on investment from their Michigan Tech education. As such, these programs add to the suite of Michigan Tech signature programs that can be marketed as part of the University’s strategy to meet enrollment targets.
 - c. What is the current enrollment in the unit?
 - i. Not Applicable
3. Impact on Resources Required by Department in Which the Program is housed. This would include, but not be limited to:
- a. Faculty lines:
 - i. See section on Steady-state Operational Costs.
 - b. Faculty and student labs, including ongoing maintenance:
 - i. Not Applicable
 - c. Advising:
 - i. Essential Education minors will increase advising needs in the units that house those minors. As the popularity of minors grows, resources will be needed to increase advisor capacity. If the university procures new audit management software as part of the implementation of Essential Education, new advising costs will be minimized as the software puts some routine advising into the hands of the students by allowing them to plan their schedules in advance and simulate the effects of choosing among the set of Essential Education minors.
 - d. Assessment:
 - i. Resources currently used for general education assessment will be reallocated for Essential Education assessment. Savings from the decrease in the number of goal committees and members will be used to provide resources for faculty doing instructor assessment of courses and also to provide more opportunities for sharing assessment results across campus (such as a possible Student Learning Summit, see [Vision Statement](#))
 - ii. Current assessment staff would transition to supporting assessment in the new program.
4. Impact on Resources Required By Other Units Within the University. This analysis would include, but not necessarily be limited to, the impacts on:

⁷ Michigan Tech (2022). *Together We Move Forward*.

- a. Other academic (e.g., Gen Ed) units with regard to faculty, labs and assessment. (NOTE: The current Student to Faculty ratio for the university as a whole is approximately 12:1 per Institutional Analysis.)
 - i. Assessment: programs will not be required to assess the new USLGs. They are encouraged to adopt or align their goals to the USLGs but it would not be required.
 - ii. Advising and recruiting will be impacted during the transition, particularly as we will have students in older audit years participating in the current general education program, new students in the proposed Essential Education program, and some students who might opt to switch.
 - b. Information Technology, the Library, central administration and career planning with respect to the impact on the need for computing services, library resources, advising, record keeping, development of employer relations etc.
 - i. The implementation of the selected ePortfolio platform will likely be a project for IT but discussions with EAS suggest it would not likely require additional personnel.
 - ii. Significant additional workload is expected in the Registrar's office to handle all the changes necessary for the switch as this will impact all existing degree audits. We have accounted for this in our budget for start-up costs.
 - iii. It is also expected that demands on the Writing Center will also increase. More faculty have been using the center for assistance with Writing Across the Curriculum-type needs and as the proposed Communication Intensive requirement opens up the ability for other units to offer such courses to meet Essential Education requirements, this need will likely increase. This is currently outside the Writing Center's funded scope. Student peer-to-peer mentors will need training on ePortfolios and there may be additional demand for that help as ePortfolio use grows. This need has been addressed as part of our steady-state operational costs budget.
5. Assessment of the ability to obtain the necessary resources assuming requested funds are obtained
- a. For high demand fields (e.g., business fields, etc.), will it be possible to fill allocated lines
 - i. Difficulty filling the proposed roles is not expected.
6. Past proposals. Has the department initiated any other new degree programs in the last five years?
- a. Not Applicable
7. Departmental Budget contribution
- a. What is the department's total general fund budget?
 - i. Not Applicable
 - b. How much tuition does the department generate? This information should be provided for both the credit hours taught by the department and the number of credit hours taken by the department's majors.

- i. All non-transfer students would be taking the full 37 credit hours in this program.
 - ii. It is estimated that \$35.4 million in tuition dollars per year would be generated in the Essential Education program. This would increase as enrollments increase to hit the desired target of 8000 undergraduate students by 2035. This calculation is based on:
 1. [current undergraduate enrollment](#) in each class,
 2. The following credit distribution taken by the population in each class: year 1 (16 credits), year 2 (11 credits), year 3 (10 credits), and
 3. in-state per-credit tuition (\$653/credit).
8. How do the benefits from this program compare to other alternatives that are currently under consideration or development. Will approval and allocation of resources to this program preclude the development of other programs?
 - a. The main alternative is no change.
 - b. The proposed resources will serve to correct existing instructional shortages and support units that will be critical to implementing this change.
 - c. Allocation of these resources will not preclude development of other programs but is expected to have many benefits to our existing degree programs (by reduced total credit counts, simplified assessment), students (reduced time to degree through lowered total credits in engineering programs and fewer bottlenecks in required Essential Education courses, simplified transfer in, more opportunities to credentialize and showcase their learning in Essential Education program), and university (hopefully enhanced enrollments, transfer-in, and retainment).

Appendices: Proposed Guidance and Operating Documents

The appendices are not part of the senate proposal. They are provided as background information to aid in its evaluation.

It is the intent that the following documents provide guidance on the initial implementation of the Essential Education program, but that the definitions and guidelines therein will be overseen by the administrative structure tasked with oversight of the program (e.g., program director and Essential Education Committee). As operating procedures should be dynamic to address emergent needs, particularly in the first several years following implementation, these documents serve to indicate the initial intent of the IDEAhub Implementation Committee but should not be considered binding. For transparency, operating procedures for the Essential Education program, particularly the criteria for course inclusion into any Essential Education category, should be kept updated and made publicly available.

Appendix A: Implementation Process

Proposed program start is Fall 2025 with a two-year implementation plan:

	23-24	24-25	25-26	26-27	27-28
	Prep	Prep	First AY	Second AY	Third AY
Registrar's office/EAS					
New tags for courses					
Update degree audits					
Encode Essential Education minors					
Develop new processes: scheduling and registration (1)					
Additional updates to systems					
ePortfolio platform integration	pilot	expanded capacity	30% capacity	60% capacity	100% capacity
Departments					
Re-classifying courses in new categories					
"White binder": changes in courses, new course proposals, degree audits					
Adapt existing minors/develop new minors for Essential Ed minor (as desired)					
Develop/adapts and pilot course for Seminar, Experience (as desired)					
Michigan Tech Seminar courses in place			100%		
ePortfolio reflection assignments integrated in Essential Ed courses					
Essential Education Experience courses in place			30%	60%	100%
Implementation team					
Workshops for developing Essential Ed minors					
Course development/Essential Ed minor development grants					
Advisor training workshops					
Faculty development workshops: ePortfolio, reflection					
ePortfolio pilots					
Assessment					
Assessment leadership teams established					
Learning goal resources developed for faculty					
Assessment workshops for faculty					
Marketing					
Create webpages and other materials highlighting Essential Ed					
Marketing: prospective students, community college partners (2)					

Notes

(1) for example: mechanism for incoming first year students to choose foundation course

(2) for example: added value of new Essential Ed features, AP and transfer equivalencies, etc.

Transition Issues

Students may adopt the Essential Education program as soon as it's available, regardless of degree year. Many courses in the current general education model will be part of the Essential Education structure, distributed between sub-lists differently. Internally, the mapping of courses between general education and the MTA could potentially be used to help students transition to Essential Education if needed.

General Education	Michigan Transfer Agreement	Essential Education
N/A	N/A	Michigan Tech Seminar*
UN 1015 Composition	1st course in English Composition	UN 1015 Composition
UN 1025 Global Issues	1st course in Social Sciences	Foundations in the Human World
Critical and Creative Thinking Core	1st course in Humanities and Fine Arts	Arts & Culture
Social Responsibility and Ethical Reasoning Core	2nd course in Social Sciences	SHAPE elective
Communication course	2nd course in English Composition or Communications	Communication Intensive
HU/FA	2nd course in Humanities and Fine Arts	(depends on course) SHAPE Elective OR DEIS
SBS	N/A	(depends on course) STEM-list, SHAPE Elective, OR DEIS
HASS	N/A	(depends on course) STEM-list, SHAPE Elective, OR DEIS
Math	1 course in quantitative reasoning	Math
Science	Natural sciences	Natural/Physical Science
Science w/ lab	Natural sciences w/ lab	STEM-list
STEM (to get to 15 cr total)	N/A	STEM-list
Co-curriculars	N/A	Activities for Well-being and Success

*could be met through major requirements taken prior to fall 2025

Appendix B: Alignment with Michigan Transfer Agreement

This Michigan Transfer Agreement (MTA) is a basic distribution model and facilitates transfer from community colleges and between universities.

For transfer students with an MTA-satisfied transcript, all Essential Education requirements will be considered complete. As students must meet the total credits required for their degree this may require additional free elective credits.

Essential Education Component:	MTA-Satisfied Transcript
Read, Write, Engage / Composition	<ul style="list-style-type: none"> All Essential Education Components listed are considered satisfied by a MTA-satisfied transcript.
Communication Intensive	
Mathematics	
Foundations in the Human World	
Arts and Culture	
SHAPE Elective	
Natural/Physical Science	
STEM (first course)	
STEM (second course)	
1 credit: Michigan Tech Seminar	<ul style="list-style-type: none"> Essential Education Components that do not map to MTA requirements are waived with a MTA-satisfied transcript.
3 credits: DEIS (3000-4000 lvl)	
3 credits: Essential Education Experience (3000-4000 lvl)	
3 credits: Activities for Well-being and Success	

Students who do not complete the entire block of courses required for the MTA will receive credit for the courses they do complete on the basis of individual course evaluation and established transfer equivalencies.

While Michigan Tech is not currently a MTA-sending institution, students intending to transfer from Michigan Tech can be advised to select courses from the Essential Education distribution lists such that they align with the MTA distribution requirements (See [Transition Issues](#)).

Appendix C: IDEAhub Background and Engagement Record

The original focus of the Education for the 21st Century initiative was the delivery of an education for undergraduate residential students that encourages the development of key competencies and mindsets to uniquely prepare them for the rapidly changing world they will encounter after graduation. Driven to address this immediate challenge, and awed by the rapid changes in the world around us, we soon realized that Michigan Tech needs to anticipate engaging in more than a single transformational change. To assure Michigan Tech's future relevance, we realized that what is also needed is an agile structure that continuously challenges the status quo and pushes us as an institution to be at the forefront of the rapidly changing needs of society--this need for agility is especially highlighted by the rapid changes necessitated by the COVID-19 crisis. As a result, IDEAhub (Innovate, Design, Engage & Act) was created--an interdisciplinary organization to serve as our campus incubator for the solution of complex problems. During the spring 2019 semester, Dr. Meadows and Dr. Raber guided a team of interested faculty and staff through the design-thinking process to continue brainstorming ideas for developing those aforementioned skill sets. These ideas were distilled into what became the IDEAhub.

IDEAhub is a broad-reaching resource and incubator for creative interdisciplinary solutions to complex problems facing Michigan Tech, the community and the world. IDEAhub engages faculty, staff, students, and community members in the design thinking process in combination with a lean startup approach to identify and act on opportunities for innovation. Through a number of working groups of more than a hundred faculty and staff from units across campus, including Student Affairs and all five colleges, IDEAhub is now poised to propose a new general education program—to be renamed Essential Education—with a learning goal framework that emphasizes abilities key to student success in the 21st century.

The Essential Education Implementation Committee built on working group reports to refine details and prepare this proposal. Throughout the process, we have given presentations and sought feedback from a variety of stakeholders, including departments and colleges and the General Education and Assessment Councils.

Statement of Engagement

In addition to drawing from the open Tech Forward and IDEAhub conversations described above, the proposal has been written in direct consultation with the Dean of the College of Sciences and Arts and the chairs of Humanities, Social Sciences, Visual and Performing Arts, Cognitive and Learning Sciences, and Engineering Fundamentals. Elements of this framework have been presented to the Senate, various departments and colleges around campus, and

General Education and Assessment Councils. The Provost has been briefed periodically on the status of the proposal.

Additionally, team members have participated in the AAC&U Institutes on Integrative Learning and Signature Work (2020), General Education Assessment (2021), and ePortfolios (2022).

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...and the many more faculty, staff, students and alumni who have engaged in the design process and shared their feedback over the past three years

Appendix D: FAQ and What-Ifs

Frequently Asked Questions

1. Will my students be able to satisfy the same number of general education courses with courses in their major as they do currently?
 - Yes!
 - Under the current general education model, most of the science and engineering majors satisfy the following 4 general education program components through major requirements: Mathematics, two Science Courses, and one STEM course.
 - In Essential Education, degree programs may satisfy the Seminar plus any 5 Essential Education components with major requirements. All programs that currently satisfy the STEM requirement in the current general education program will still be able to. With no restrictions on which components may be satisfied by major requirements, this opens up the ability to overlap major and Essential Education requirements to all degree programs and allows courses like EC3400 (required by several engineering majors) to be used to satisfy an additional Essential Education component.
2. What if a program requires a 4 or 5-credit Math class as this model requires only 3 credits?
 - A larger-credit math class will meet the requirement and isn't much different than the current requirement being 4 credits minimum when there are 5- and 6-credit options in the list. Setting the minimum to 3-credits opens the doors to other math/quantitative courses that are currently on our STEM mathematics course list (e.g. BUS2300, SS4010), and for perhaps others to be added (e.g. MA2710 Statistics, which students can earn AP credit for), to fulfill the requirements. This will be helpful for students who are in programs without a specific math requirement.
3. What exactly will be on each of these distribution lists?
 - All courses currently on the HASS, HASS restricted, STEM, and STEM restricted lists will be brought into Essential Education lists.
 - Initial distribution lists will be created in collaboration with the academic units and faculty based on the definitions and criteria articulated in the [Vision document](#)
 - Lists will be managed moving forward by the Essential Education program leadership team (or their designee).
4. How will AP, IB, CLEP, and dual enrollment credits count?
 - Course equivalencies for exam-based credits (AP, IB, CLEP) are [available online](#) and courses will count based on what specific credit is awarded and where that course is represented in the distribution lists.
 - Credit earned through dual enrollment will count based on where the courses (whether taken through Michigan Tech or their transfer equivalencies) are represented in the distribution lists.
 - Guidance will be developed to help advisors and recruiters answer student questions about strategically planning ahead with these options.

5. Will a student who, for example, comes in with AP credit for a math course be penalized for not having an ePortfolio artifact for that class?
 - No. There is no requirement to provide artifacts and reflections for each component of Essential Education in order to complete the requirement.
 - While this activity is built into courses throughout the Essential Education program, there would be no penalty for transfer students who are “missing” materials due to transfer.
6. How will this work with the Michigan Transfer Agreement (MTA)?
 - See [Appendix B: Alignment with Michigan Transfer Agreement](#)
7. Will all students be switched to Essential Education?
 - No. All new incoming students starting in and after Fall 2025 would be part of audit years that have Essential Education built-in. Students who start before full implementation could have the option to change their audit year but would not be required to do so.
8. What happened to the “themed pathway” idea?
 - “Themes” are being viewed primarily as an advising tool, where courses that support specific themes (e.g., Sustainability) can be identified in the normal distribution lists to help students focus on particular interests. The implementation committee will develop and publish themed course lists for advisors and students to use in course planning. Themed course lists will be rolled out in Fall 2025 as part of the overall Essential Education marketing strategy. No credential had been planned for completing a theme so there is no fundamental change, but by being informal, students may feel they have more freedom to navigate the course options. The current model leans more into the minor option.
9. Given the similarity between the distribution and minor pathways, can you simply collapse them so the requirements are the same?
 - The minors are a substantial and intentional departure from the Michigan Transfer Agreement, allowing us to create interdisciplinary minors that are aligned with topics of interest at Michigan Tech. The distribution pathway ensures that we have a place for transfer students who come in and may not easily transfer into a minor, students who are planning to transfer out, students who aren't sure what minor they want to do or students who change their mind about a minor. Providing two pathways provides the most flexibility for all students.
10. Will our unit have to change our minors to be Essential Education minors?
 - No existing minor will be forced to become an Essential Education minor. It is at the discretion of the offering department to determine whether they would like to adapt existing minors, propose new minors for Essential Education, or participate at all.
11. Will it literally be a “minor in Essential Education”? How will an Essential Education minor look on transcripts and diplomas?
 - No.

- Essential Education minors will look exactly the same as disciplinary minors, and each minor will have its own unique title. They will not be referred to as an “Essential Education minor” on transcripts or diplomas. “Essential Education minor” simply designates those minors that meet the restrictions for use in the Essential Education pathway.
12. Can a student still earn a disciplinary or STEM minor?
- Yes! Minors can overlap with major requirements, just not with the requirements for another minor as established by current policy. So, for example, as long as the courses aren’t also being used to earn an Essential Education minor, students could earn a STEM minor with the same STEM courses used for Essential Education, with courses from their major, and/or by using available free electives.
13. The current Communication/Composition requirement is a significant bottleneck, how will Essential Education make that situation better?
- This is a recognized issue in the current general education program. As described in the [Vision Document](#), the rules for getting a course onto the Communication List will be less restrictive than currently in place. It is expected that most courses on this list will be offered by the Humanities department, but it is not a requirement, which opens up opportunities for other units to propose and develop courses for this list.
14. Will faculty be expected to grade all the reflections students submit for their ePortfolio? Won't this take a lot of additional faculty time?
- There is no expectation that instructors will "grade" the reflections (with the exception of the Michigan Tech Seminar, where students will get formative feedback on reflective writing, and the Michigan Tech Experience, where a showcase ePortfolio is required). The assignment that is submitted to the ePortfolio should be something the instructor would assign and grade anyway, and the reflection requires just a checkpoint to see that it is submitted. Faculty will be provided with a wide range of suggested reflection prompts to give them options that are well-aligned with their existing course learning goals and the Essential Abilities. The ePortfolio platform we are recommending is integrated with Canvas, so faculty will not have to go into a student’s ePortfolio to see that they have completed this requirement.
 - Instructors who participated in a prior IDEAhub pilot program on reflection in the classroom found that student reflections, as a high-impact practice, supported student learning and provided information about students’ progress toward learning objectives that went beyond the information available through traditional tests and assignments.
15. What happens if a student avoids the ePortfolio altogether? Will they still be able to graduate?
- The completion of an ePortfolio is not required for graduation. However, the ePortfolio is built into courses in the program, so a student will be expected to

complete ePortfolio steps as part of their course requirements (losing points toward their final grade in the course if they do not). A showcase ePortfolio will be a required element of the Essential Education Experience courses. ePortfolio checks will also be built into Essential Education minors if they do not include an Essential Education Experience.

16. Are you bringing back Perspectives?

- No.

17. Are you bringing back Thematic Clusters?

- No.

What-if Scenarios

What if...

1. ...a student starts an Essential Education minor but before finishing switches to the distribution pathway?
 - The minor and distribution pathways contain the following components in common: Communication Intensive course, DEIS course, and SHAPE elective course, so those courses would automatically map between the pathways. If the minor requires an Essential Education Experience, that would also automatically map over. If not, the unspecified minor courses from the SHAPE lists could align with the Arts and Culture and/or STEM list (as that will have some overlap with the SHAPE lists).
 - If a student takes the minor-specific course (that is not restricted to the SHAPE lists) before switching and it doesn't count in that student's major, that would have to count as a free elective if the student has those credits available.
 - It is envisioned that these minors would have rather broad course lists for students to select from, which will hopefully avoid scheduling issues that prevent completion. It's possible that some Essential Education minors could be intentionally built to maximize the overlap with the distribution pathway.
2. ...a student starts an Essential Education minor but before finishing switches to a similar disciplinary minor that provides more depth, considering that current policy prohibits double counting between minors?
 - Example: a student begins in a (hypothetical) Global Languages and Cultures Essential Education minor but decides they would like to take the extra classes to earn a Spanish, German, or French language minor. They can't double-count credits for two minors per the current policy on minors ([406.1](#)).
 - Most courses in the Essential Education minors would also satisfy the pathway distribution. If students had already taken a minor-specific course that was not part of the Pathway distribution lists, those would either count towards the new minor or free electives and the remaining credits would need to be satisfied in the Essential Education program.
3. ...a student *completes* an approved Essential Education minor and a related disciplinary minor?
 - As credits may not overlap between two minors, students will need to designate only one for a credential.
 - We will have a mechanism for students to choose which credential they want to earn. The student can complete the requirements for the Essential Education minor as their general education credits, but choose not to earn that minor as their credential.
 - We will employ a mechanism in Banner or the audit system (as most appropriate) to track that the Essential Education requirements are met, even if the minor is not awarded.
4. ...a student completes the requirements for an Essential Education minor that requires a showcase ePortfolio, but doesn't submit the ePortfolio?

- Students who take all the required classes for an Essential Education minor but do not submit an ePortfolio (where required) will be considered to have completed their Essential Education requirements but will not earn the minor credential.
5. ...a student transfers in but has not completed the MTA or transfers from out of state?
- Follow current practice: “Students who do not complete the entire block of courses required for the MTA will receive credit for the courses they do complete on the basis of individual course evaluation and established transfer equivalencies.” The structure of Essential Education should allow for most normal courses to slot in. See the description in [Appendix E: Essential Education Vision Statement](#).

Appendix E: Essential Education Vision Statement

Reimagining Education for the 21st Century

Tech Forward Initiative

A Vision for Essential Education at Michigan Tech

January 29, 2023

(lightly modified from Jan 23, 2023 shared draft)



A Vision for Essential Education at Michigan Tech

At Michigan Technological University, we strive to prepare our students to create innovative solutions to tomorrow's problems. Michigan Technological University excels in providing the technological education that is needed for the future. But technical skills alone will not help our graduates reach their full potential. [In today's rapidly-changing world of employment](#), many 21st century learners will be working in positions that do not currently exist, using tools that have yet to be invented, and solving problems that are at the intersection of the human, digital, built, and natural worlds.

As educators, it is our responsibility to ensure that our students are prepared to enter and succeed in this changing world – to have the skills to become culturally-responsive leaders who are civically engaged. This line of thinking is at the heart of Essential Education, a core component of our Tech Forward vision. After many refinements based on input from hundreds of faculty members, administrators, staff, students, and alumni, we believe the proposed model aligns with our Tech Forward vision and will help us connect with prospective students nationally and internationally who are looking for an educational experience that fully and comprehensively prepares them to become technology leaders and innovators.

Essential Education is:

- An opportunity for Michigan Tech to become a national leader and innovator in educating and preparing students to be leaders in the Fourth Industrial Revolution
- A forward-thinking curriculum that prepares students for a future where opportunities and careers might currently be unimagined
- A structure that further aligns our undergraduate curriculum with [business workforce needs](#) and enhances our students' career opportunities
- An integrated curriculum where students take ownership of their learning in and out of the classroom and are able to apply it to the complex challenges faced by a diverse and rapidly changing technological society

In the Essential Education program, all Michigan Tech students will:

- Build foundations of knowledge through a broad set of courses in both STEM and SHAPE⁸ fields.
- Begin developing 21st century skills like communication, collaboration, and self-reflection in their very first year on campus as they develop a sense of belonging and map out their Michigan Tech journey
- Think deeply and broadly about the big questions of our time through their pathway courses—applying the tools and insights of multiple disciplines to become agile, culturally-aware, and creative thinkers.
- Engage in the following [high impact practices \(HIP\)](#), known to increase student learning, satisfaction, and retention: first year seminars, writing intensive courses, diversity/global learning, community-based learning, and ePortfolio

⁸ SHAPE = Social Sciences Humanities & the Arts for People and the Economy/Environment.
<https://www.thebritishacademy.ac.uk/this-is-shape/>

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List of Abbreviations and Definitions

A&C: Arts and Culture

ABET: Accreditation Board for Engineering and Technology

CI: Communication Intensive

DEIS: Diversity, Equity, Inclusion, and Sense of Belonging

HIP: [High Impact Practices](#)

HLC: Higher Learning Commission

MTA: Michigan Transfer Agreement

SHAPE: [Social Sciences Humanities & the Arts for People and the Economy/Environment](#)

STEM: Science, Technology, Engineering, and Mathematics

USLG: Undergraduate Student Learning Goals

A Vision for Essential Education at Michigan Tech

Overall Structure

The proposed Essential Education program includes 37 credit hours. This includes 3 credits of Activities for Well-being and Success (formerly co-curriculars).

This represents an overall 5-credit reduction from the current general education program.

The Essential Education framework includes 13 requirements, divided into three segments: The first-year Experience, the Pathway, and Activities for Well-being and Success. Students can choose one of two pathways: a Distribution Pathway or an Essential Education Minor Pathway. Details on each type of course and on the composition of an Essential Education Minor are included in the sections below.

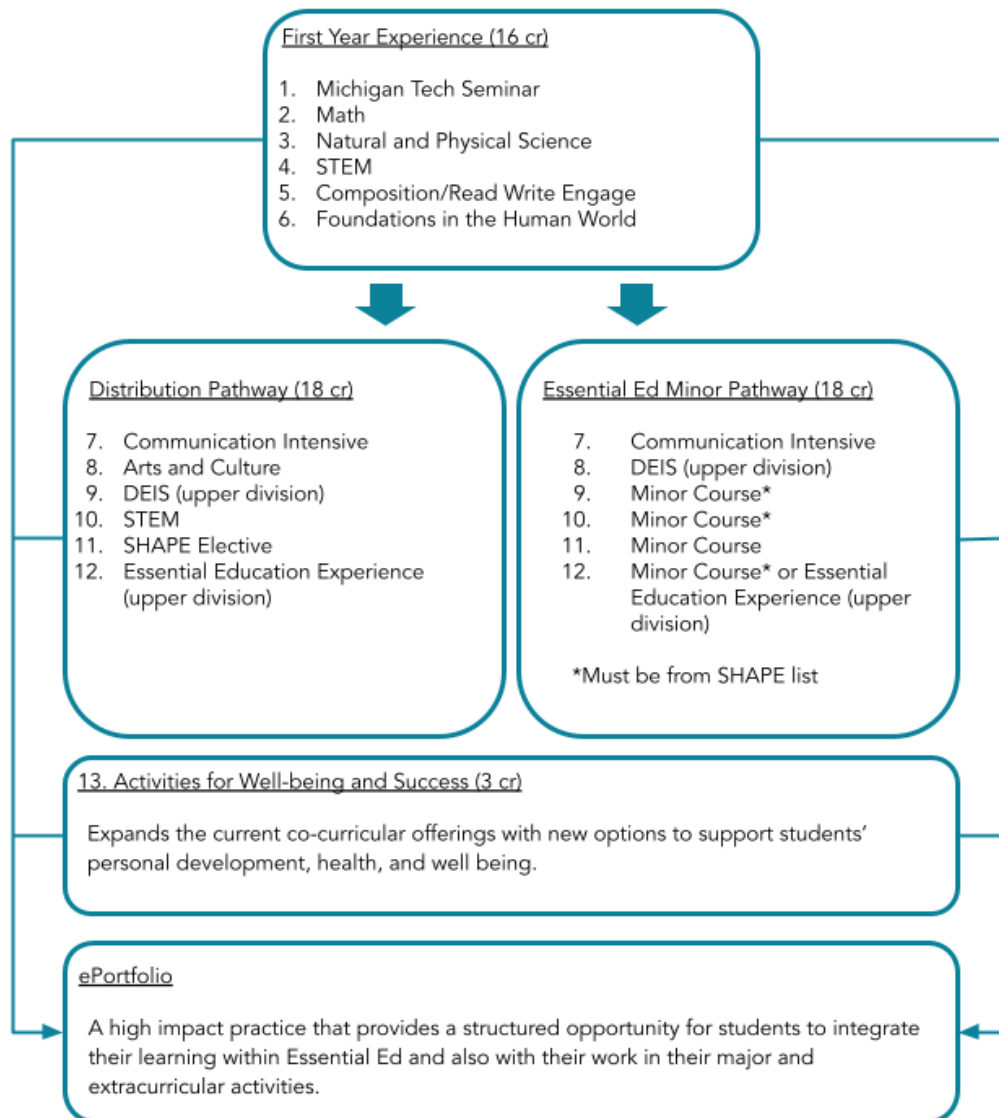


Figure 1. Structure of Essential Education Program

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Learning Goals

Michigan Tech currently has 8 undergraduate student learning goals, of which 6 are used in the assessment of general education. These 6 USLGs include a total of 41 performance criteria. The Essential Education program proposes a reduction to 4 undergraduate student learning goals with 12 performance criteria that we call Essential Abilities. This reduction will bring us in line with the number of learning goals and performance criteria at peer institutions and simplify assessment within general education.

Goal	Essential Abilities
<p>Think Critically The ability to think critically about complex issues is vital for all students. While the disciplinary context and subject matter will vary, abilities to carefully consider assumptions, available information, and the ethical dimensions of problems and proposed solutions are key skills. Collectively, these skills help students make sense of large amounts of information, detect and avoid fallacies, facilitate dialogue, attend to diverse perspectives, and cultivate a deeper awareness of how to connect and synthesize cultural, social, economic, and scientific ideas.</p>	<ul style="list-style-type: none"> ● Question Assumptions ● Evaluate Information ● Analyze Ethical Implications
<p>Communicate The challenges of the 21st Century require the ability to communicate information and ideas intentionally, strategically, and responsibly—across a range of audiences, disciplines, and media—using a variety of modes (written, spoken, quantitative). Such communication requires attention to the diversity of contexts (global, local, intercultural). Skillfulness in this area involves the ability to connect with others through interpersonal and group communication skills.</p>	<ul style="list-style-type: none"> ● Communicate Quantitatively ● Communicate Contextually ● Foster Collaboration
<p>Adapt Working and living in a diverse and rapidly changing technological society requires skills and mindsets that support lifelong learning, personal and professional growth, agility, and resilience. It is important that students are able and willing to take appropriate personal or intellectual risks, reflect on their own performance (successes and failures), and consider diverse perspectives that may evolve over time.</p>	<ul style="list-style-type: none"> ● Reflect ● Welcome Challenge ● Explore Diverse Perspectives
<p>Contribute/Transform A new frontier is emerging where the solutions to societal problems will be found in a rapidly changing world where science, technology, humanities, arts, and social sciences intersect. In this environment, those who seek to make significant contributions to society must engage with multiple perspectives and use well-developed creative thinking skills to form new ideas that inform their actions. It is essential for students to develop, share, and inspire creativity— such as by pursuing opportunities in the creative arts, collaborating to find innovative and ethical solutions, and contributing to their communities and the broader world.</p>	<ul style="list-style-type: none"> ● Engage in Civic Life ● Innovate Solutions ● Create

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Essential Education Curricular Elements

Listed in the order shown in Figure 1.

Michigan Tech Seminar

Description

First-year students often struggle with the adjustment to college life. This requirement is designed to help students map out their path through college, to develop the habits and mindsets of successful students, and to build a sense of community and belonging with Michigan Tech. Courses fulfilling this requirement are also intended to introduce students to, and encourage an understanding of, the undergraduate student learning goals and their connection to 21st century skills desired by employers. Students will learn skills in reflection and folio thinking and will begin their ePortfolios.

Rules/Criteria

Courses that are used to fulfill this requirement must incorporate the process of reflection, an introduction to the undergraduate student learning goals, and the establishment of an ePortfolio. It is envisioned that these requirements can be satisfied through a variety of existing 1-3 credit first-year courses, providing they incorporate the required elements. Some initial examples where we have faculty buy-in include:

- ENG 1101 Engineering Analysis and Problem Solving
- Intro to the major courses
- Pavlis Honors first-year seminar
- First-year student success courses
- A seminar specific to transfer students will also be developed to address their particular needs for developing community at Michigan Tech, reflecting on the learning goals, and beginning their ePortfolio

Guidelines and support for integrating this material into existing courses will be developed and provided.

Math Requirement

Description

The Math list will include all courses on Michigan Tech's [current general education Math list](#). A key change is that we are requiring 3 credits of math rather than 4.

Rules/Criteria

All courses on the Math list will assess at least one of the Essential Abilities and require students to submit an assignment plus a reflection to their ePortfolio. Math courses will be taught primarily by the Department of Mathematical Sciences, with exceptions made for

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discipline-specific courses in statistics and quantitative problem solving inline with current practices.

Natural and Physical Science Requirement

Description

The Natural and Physical Science list includes all courses on the current [General Education Science List](#). Other courses in natural and physical sciences may be proposed for this list, provided they meet the criteria below.

Rules/Criteria

All courses on the Natural and Physical Science list will assess at least one of the Essential Abilities and require students to submit an assignment plus a reflection to their ePortfolio. Consistent with current practices, Natural and Physical Science courses will be taught primarily by the Departments of Biological Sciences, Chemistry, Physics, Geological and Mining Engineering and Sciences, Kinesiology & Integrated Physiology, and the College of Forest Resources and Environmental Science.

STEM Requirement

Description

The STEM list includes all courses on the Essential Education Math and Natural and Physical Science list. Courses currently on the [restricted STEM list](#) will also be automatically included with the approval of the course's home department. Other courses in Science, Technology, Engineering, and Math may be proposed for this list, provided they meet the criteria below.

Rules/Criteria

All courses on the STEM list will assess at least one of the Essential Abilities and will require students to submit an assignment plus a reflection to their ePortfolio. STEM courses will be taught primarily by the Departments of Mathematics, Biological Sciences, Chemistry, Physics, College of Engineering, College of Computing, and College of Forest Resources and Environmental Science. In line with current practice, STEM courses are not restricted by college or department and may include courses in the human sciences and other technology related fields. (See the current STEM-restricted list for examples.) STEM courses must be open to students in all majors and may have pre- or co-requisites as long as those courses are on the overall Essential Education course list.

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Composition or First-Year Read, Write, Engage Course

Description

As in our current general education structure, all students will take a first-year course focused on writing in a variety of modes with attention to audience, purpose, and context.

In fall 2022, an alternative first-year writing course was piloted: “Read, Write, Engage.” This course introduces students to several disciplinary perspectives on a big idea. Through attentive reading of texts from different traditions, students build their critical thinking and communication abilities. The course projects are comparable in scope to those in composition and similarly require students to practice writing in a variety of modes with attention to audience, purpose, and context.

Rules/Criteria

All Composition courses will assess the “Communicate Contextually” Essential Ability and require students to submit an assignment plus a reflection to their ePortfolio. The Humanities department will continue to offer all first-year composition courses. Read, Write, Engage, as a potential new model for addressing the same learning outcomes as UN 1015 Composition, will continue in a pilot phase with the goal of developing further the rules/criteria for inclusion.

Foundations in the Human World Choice Point

Description

Taking the spot previously held by Global Issues, we propose a choice point called Foundations in the Human World. The initial list of courses will be an amalgamation of the current [Creative and Critical Thinking and Social Responsibility and Ethical Reasoning Core lists](#), with modest changes that combine, eliminate, or propose new courses in line with the unit's changing contributions to Essential Education. These courses are gateways to the disciplines that comprise the SHAPE units: Departments of Social Sciences, Humanities, Visual and Performing Arts, Cognitive and Learning Sciences, and the College of Business. The Foundations in the Human World courses ensure that students have exposure to the arts, humanities, and/or human sciences in the first year, to complement first-year courses in math, natural and physical sciences, and composition. As a whole, the first-year experience encourages critical thinking through a variety of disciplinary lenses.

In contrast with Global Issues, the Foundations in the Human World requirement will give students a choice between several courses. We are working with the registrar on a process for first-year students to provide their top choices prior to arriving at Michigan Tech, allowing us to balance the benefits of cohorting (used in first-year engineering) with student curricular choice.

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Rules/Criteria

All courses on the Foundations in the Human World list will assess at least one of the Essential Abilities and will require students to submit an assignment plus a reflection to their ePortfolio.

To be included, courses must be 1000- or 2000-level foundational courses in the SHAPE disciplines, including social and behavioral sciences, humanities, arts, and economics.

Communication Intensive Choice Point

Description

These courses focus on instruction in at least one form of communication (e.g., written or oral). Assignments will require students to draft and revise communication products in response to detailed feedback from peers and instructors. In the process, students will learn to give actionable feedback and expand their knowledge of best practices in communication processes and products.

The second communication/composition requirement is a bottleneck in the current general education system. We expect that changes in the rules/criteria below will expand this list of courses further and help eliminate this bottleneck.

Rules/Criteria

All courses on the Communication Intensive list will assess at least one of the Essential Abilities and will require students to submit an assignment plus a reflection to their ePortfolio.

To be included, a course cannot be limited to students in specific majors or colleges. Communication-intensive courses must explicitly include assignments that address at least one form of communication and incorporate a process including drafts, feedback (peer-to-peer feedback as well as instructor feedback) and revision. Assignments must be explicitly and separately evaluated on the merits of the written/oral communication itself (not only on the subject matter content). It is expected that at least half of the course learning goals should explicitly focus on communication topics, supported by readings and assignments. In order to qualify to teach this course, instructors need to demonstrate their expertise in discussing, evaluating, and studying written/oral communication as a topic.

While these rules have been intentionally designed to allow flexibility in which units may offer Communication-Intensive courses, we expect that Humanities will continue to be the primary unit responsible for meeting campus demand for this Essential Education requirement.

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Arts and Culture Choice Point

Description

Arts and Culture courses prepare students to critically engage with the socio-cultural contexts of our contemporary world. These courses will develop skills for critical and creative analysis, encourage innovative problem solving, and support practices of engagement that will empower students to be active participants in the creation of knowledge and understanding.

Arts and Culture courses will ask students to do one or more of the following:

- Create their own response to the modern world by understanding and exploring their personal traditions and the traditions of others.
- Investigate the historical and contemporary perspectives of cultural, aesthetic, and intellectual expression to explore how these shape societies.
- Develop skills in a diverse set of artistic and practical techniques and apply these to create works of art or artisanship.
- Develop the ability to understand and interpret art and artifacts as meaningful expressions of the human experience (including writing, visual arts, dramatic performance, music, human history, language, and culture)

Rules/Criteria

All courses on the Arts and Culture list will assess at least one of the Essential Abilities and will require students to submit an assignment plus a reflection to their ePortfolio.

Courses in the Arts and Culture category are not restricted by level. It is anticipated that most of these courses will be delivered by the Departments of Visual and Performing Arts, Humanities, Social Sciences, and Cognitive and Learning Sciences. To be considered for inclusion, at least two of the course learning objectives must align with the one or more of the four major themes:

- Cultural Contingency: the ways in which cultural rules and biases influence our awareness of “others,” the global variety of existing cultural systems, the impact of this diversity on alternative ways of viewing and understanding the world, local systems, and/or current power structures and inequalities.
- Historical Context: the historical development of the modern world, an understanding of broader explanatory connections, including contemporary perspectives on cultural, aesthetic, and intellectual expression, that contextualize the structures responsible for supporting the current and future global system.
- Creative and Critical Analysis: critical and comprehensive exploration of an issue or idea and creative analyses that allow for the possibility of new ideas, interpretations, actions, or responses to those issues, ideas, or works of art and artisanship.
- Artistic Expression: the application of a diverse set of artistic and practical techniques to create works of art and artisanship.

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Diversity/Equity/Inclusion and Sense of Belonging (DEIS) Choice Point

Description

The DEIS requirement is aligned with Michigan Tech's vision to be "a globally recognized technological university that educates students, advances knowledge, and innovates to improve the quality of life and to promote mutual respect and equity for all people within the state, the nation, and the global community."

The DEIS requirement is designed to support students in their development of a critical understanding of diversity, inclusion, power, and privilege, in addition but not limited to identities impacted by the intersections of race, ethnicity, culture, gender, sexuality, social class, and disability. Courses may address how political and economic processes impact people of different social identities, including either domestic or international issues or implications.

A non-exhaustive list of existing courses that may meet the spirit and intention of the DEIS requirement includes:

- ART3420 World Sculpture Traditions
- EC4710 Labor/Human Resource Economics
- FW4111 Indigenous Natural Resources Management
- HU3261 Communicating Across Cultures
- HU3262 Topics in Francophone Cultures
- HU3264 Topics in Spanish-Speaking Cultures
- HU3400 Topics in Diversity Studies
- HU3401 Gender and Culture
- HU3410 Introduction to Diversity Studies
- HU3802 Media and Globalization
- PSY3340 Psychology of Race
- PSY3720 Social Psychology
- PSY4340 Culture and Cognition
- SS3105 Native American and Indigenous Communities
- SS3225 Capitalism and the Modern World
- SS3260 Latin American Cultural History
- SS3270 Archaeology of the African Diaspora
- SS3542 History of Detroit
- SS3661 Civil Rights & Civil Liberties
- SS3665 Crime, Incarceration, and Policy
- SS3910 Histories and Cultures
- SS3961 Preparing for Cross-Cultural Immersion Experiences

We expect that other current courses will be adapted to address this requirement and that new courses will be proposed as part of the College of Sciences and Arts' DEIS Strategic Plan.

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Rules/Criteria

All courses on the DEIS list will assess at least one of the Essential Abilities and will require students to submit an assignment plus a reflection to their ePortfolio.

DEIS classes are restricted to upper-division courses (3000/4000 level). DEIS courses must address two or more of the following thematic topics in the learning goals, materials, and assignments: diversity, equity, inclusion, social justice, access, participation, human rights, power structures, colonial legacies, LGBTQIA+, intersectionality, critical cross-cultural immersion.

All approved DEIS courses will include at least two of the following learning objectives:

- Students will be able to demonstrate an understanding of and engage with the principles of diversity, equity, inclusion and social justice including but not limited to one or more of the following: equity, access, diversity, participation, and/or human rights.
- Students will be able to identify how various groups navigate the world with different and ever changing amounts of power and vulnerability.
- Students will be able to critically reflect on their own position(s) within a myriad of power structures.
- Students will be able to demonstrate an understanding of the historical context(s) of current inequities.

The majority of DEIS courses will be delivered by the Departments of Social Sciences, Humanities, Cognitive and Learning Sciences, and Visual and Performing Arts; however, the ability to offer DEIS courses is not restricted. DEIS courses from outside of these units may be approved on a case-by-case basis as long as the course is open to all students on campus and meets the required learning objectives.

SHAPE Electives

Description

SHAPE stands for Social Sciences Humanities & the Arts for People and the Economy/Environment. Coined by the British Academy, the term was developed as a collective name for the disciplines that we've previously referred to as HASS (Humanities, Arts, and Social Sciences) that "help us make sense of the human world, to value and express the complexity of life and culture, and to understand and solve global issues."⁹

The SHAPE list include all courses on the following lists:

- Foundations in the Human World
- Arts & Culture

⁹ <https://www.thebritishacademy.ac.uk/this-is-shape/>

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- Communication Intensive
- Diversity/Equity/Inclusion/Sense of Belonging
- All other courses currently listed on Michigan Tech's HASS and HASS-restricted lists.

Rules/Criteria

All courses on the SHAPE list will assess at least one of the Essential Abilities and will require students to submit an assignment plus a reflection to their ePortfolio. SHAPE Electives will be primarily taught by the SHAPE disciplines.

Essential Education Experience

Description

These experiences are meant to help prepare our students for an ever-changing, dynamic, and diverse world. This active, hands-on experience is expected to expand interaction with the greater society (beyond self) and allow for connections among general education courses. Civic engagement is defined as experiences where students identify issues of public concern, seeking to understand patterns, outcomes of actions, and/or complexity. These experiences will increase their social awareness, global understandings, or cultural competencies through experiential learning. This may include the specific use of disciplinary knowledge but it must extend significantly beyond in a manner that supports society in a meaningful way.

Michigan Tech is known for its hands-on approach to learning, however this largely applies only within the major. Extending this to the Essential Education curriculum will allow students to actively apply their general education knowledge through experiential learning that is designed to increase their social awareness, global understanding, and cultural competencies in a way that fosters lifelong global citizenship through their personal and professional lives.

Rules/Criteria

Essential Education Experiences are upper-division courses. The 3-credits of Essential Education Experience may be obtained through a combination of several upper-division courses or a single, 3-credit, course with the following required and desirable components:

Required Components of a Essential Education Experience

- Interdisciplinary approaches integrating SHAPE disciplines
- Reflection and critical analysis of problems/opportunities, critical needs, or career/life pathway exploration
- An emphasis on immersive project-based or experiential learning
- Student production of a showcase ePortfolio that includes reflection and integration of learning from across the Essential Education curriculum
- Upper division

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Desirable Components

- Team work (which is specifically assessed)
- Dissemination of results (e.g., portfolio, conferences, reports, poster fairs)
- Student-led project in which students manage and take an active leadership role while faculty facilitate and guide
- Sustainable collaboration with external partners
- Interdisciplinary teams that effectively utilize skills from multiple SHAPE disciplines

The Essential Education Experience is intended as a culminating or near-culminating curricular element, requiring that students have completed at least 3 requirements in the Pathway.

To avoid student confusion in advising and prevent bottleneck problems, Essential Education Experiences will not be dual listed on other Essential Education course-type lists.

Logistics

Students will have three different options for meeting the Essential Education Experience requirement:

- Option 1: Courses from SHAPE disciplines with a significant civic engagement or service learning component. We expect that the responsibility for teaching these courses will be distributed across SS, HU, VPA, CLS, and COB (home to the SHAPE disciplines). A non-exhaustive list of existing courses that could meet the spirit and intention of this option include:
 - SS3090 Undergraduate Program for Exploration and Research in the Social Sciences
 - SS3905 Environmental Justice
 - SS4120 Sustainable Development and Communities
 - SS4450 Sustainable Tourism and Planning
 - SS4700 Communities and Research
 - HU3694 Grant Writing
 - HU3703 Environmental Philosophy
 - PSY4080 Nature Psychology
 - ART3180 Color and Creativity
 - ART3950 International Arts Immersion
 - ART4410 Advanced Sculpture Studio
 - ART4440 Advanced Ceramics
 - ART4450 Advanced Creative Drawing and Painting Studio

Assuming incoming classes of 2000 students, we anticipate needing approximately 28 sections of Essential Education Experience courses per semester to meet demand. The Department of Social Sciences is expected to cover approximately half of this demand,

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leveraging existing course work and new courses developed and supported through resources previously used for Global Issues.

- Option 2: Planned student experiences. Faculty-led study abroad would be one way for students to satisfy this requirement. We also anticipate that the Pavlis Honors College project experience or immersion requirement can be adapted as an Essential Education Experience component. To count as an Essential Education Experience, experiences must include an integrated curricular component. Examples of existing opportunities that meet the spirit and intention of the Essential Education Experience include
 - Costa Rica study abroad
 - Amtrak study away

We recognize that study away and study abroad are not accessible to all students; however, this choice point is well aligned with Michigan Tech's mission to grow and increase access to these opportunities for Michigan Tech students. Currently, SHAPE departments offer approximately 6-8 sections of study away per year with growth expected over the next 2-3 years.

- Option 3: Curricular course that leverages student's extracurricular experiences, leadership roles, or other philanthropic activities. These would involve a 3-credit preparatory course that supports developing cultural competency and skill in community-based collaborations to support the student-driven experience. We anticipate that a course with a curriculum similar to SS4700 Communities and Research or MGT2000 Team Dynamics and Decision Making could be a blueprint for this course. We expect that these courses could be provided by all of the SHAPE disciplines, as demand requires.

It is expected that this area of Essential Education will have tremendous innovation, development, and change as this educational experience matures and grows.

Essential Education Pathways

Description

Students will have the choice of two 18-credit pathways through Essential Education: a distributive pathway with guided course lists that can be used in advising and course selection to encourage students to choose courses that work together to address broad themes (Sustainability, Health, Social Justice, etc.). Or, students can choose an Essential Education Minor pathway that allows them to earn a credential completely within the structure of Essential Education. These are specific minors that are created to satisfy the spirit of Essential Education by introducing students to multiple disciplinary perspectives, as a complement to their major. Having two paths (one more open, the other more specific) will also preserve flexibility for students to change their minds as they move through the program or forge their own connections and make meaning for themselves through course selection. Both paths ask

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students to produce a showcase ePortfolio that encourages them to look for and make connections between their general education courses, their major courses, and their career interests/goals.

Essential Education Minors may address the same broad themes as the course lists or may be developed around other interdisciplinary topics. Essential Education Minors allow students to pursue a more focused path through their general education and to earn a credential without taking any extra courses beyond their degree requirements.

Rules/Criteria: Distribution Pathway (18 credits)

- 3 credits: Communication Intensive Course
- 3 credits: DEIS (3000-4000 lvl)
- 3 credits: Arts & Culture
- 3 credits: STEM
- 3 credits: SHAPE elective
- 3 credits: Essential Education Experience

Thematic course lists will be introduced in the Michigan Tech Seminar to aid students in mapping out their academic journey. Themes are intended to support advising and build coherence in the Essential Education program, but are not prescriptive. Students will not be required to declare a theme or take all of their courses in a single particular theme.

Rules/Criteria: Essential Education Minors (18 credits)

To be approved as an Essential Education Minor, units must curate a set of minor courses that ensure that students will fulfill the following distribution requirements:

- 3 credits: Communication Intensive Course
- 3 credits: DEIS
- 3 credits: SHAPE course
- 3 credits: SHAPE course
- 3 credits: Unrestricted course
- 3 credits: Essential Education Experience or upper division SHAPE course

Additionally, the following requirement must be met:

- Essential Education Minors should be interdisciplinary, with at least $\frac{1}{3}$ of the credits (6 credits) coming from outside of the proposing unit.

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- At least 15 credits of the minor must be drawn from the SHAPE or Essential Education Experience lists.
- An unrestricted course—not part of any Essential Education course list—can be from any unit on campus, at any level. However, the course must have no pre-requisites or only prerequisites that can be completed as part of Essential Education.
- Courses/choice points included in the proposed Essential Education minor must have the capacity to accommodate likely student enrollment. In addition, units proposing Essential Education minors must demonstrate that it is possible to complete the minor in no more than three years. Offering units should demonstrate this ability by indicating semester offerings and capacity. Consideration should be given to any courses that are offered in alternate years only.
- Essential Education Minors are intended to provide breadth to a student's overall academic journey. Accordingly, Essential Education Minors in a given department will typically be restricted from students majoring in the same department. Proposing departments may apply for an exemption to this rule if they demonstrate that there is not significant overlap (more than 6 cr.) with existing major course requirements. For example, we envision Essential Education Minors related to Modern Languages would be open to all majors.
- To earn the Essential Education Minor credential, students will submit a showcase ePortfolio to the sponsoring department. Students who take all the required classes for the minor but do not submit an ePortfolio will be considered to have completed their general education requirements but will not earn the minor credential. (We envision this as a possibility for students who have completed the requirements for both an Essential Education Minor and a related disciplinary minor. As credits may not overlap between two minors, students will need to designate only one for a credential.)

Essential Education Minors are not disciplinary minors and will not replace them. Some current minors (e.g., [Sustainability Science & Society \(SSSM\)](#), [Diversity Studies \(HUDS\)](#), [Enterprise \(ENTM\)](#), [Leadership \(IMLE\)](#)) could be re-designed as Essential Education Minors with modest changes in how courses are grouped on the minor audit. An additional 20 existing minors include significant overlap with the Essential Education Minor requirements described above.

It is expected that this area of Essential Education will provide ongoing opportunities for innovation and collaboration across units to develop new Essential Education Minors, especially in emerging interdisciplinary areas, as motivated by the [Education Goals](#) listed in Michigan Tech's Strategic Plan. We invite departments across campus to collaborate with the SHAPE departments on the creation of Essential Education Minors that may be particularly relevant or interesting to their students and may include a major requirement or technical elective as part of the minor.

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Activities for Well-being and Success

Description

These courses foster opportunities for students to connect with others, be active, restore their minds and bodies, or extend/expand their learning into areas beyond typical academic pursuits and skill sets. Per the Higher Learning Commission (HLC), co-curriculars are learning activities, programs and experiences that reinforce the institution's mission and values and complement the formal curriculum. Currently at Michigan Tech, we define co-curriculars as PE classes, some music ensembles and lessons, and a small selection of other classes that support well-being.

We propose re-designing the current co-curricular structure to provide expanded options to students that focus on personal health & well-being, as well as developing and practicing 21st Century skills and mindsets. The proposed framework reframes the previous 3 "units" of largely Physical Education and Music-related courses, as credits and includes them in the Essential Education curriculum and degree-credit totals (which they had historically been as well). The emphasis of these courses as part of the Essential Education program will reinforce the importance of forming strong habits of personal development and lifelong learning.

Rules/Criteria

Courses on the Activities for Well-being and Success list will be encouraged (but not required) to require students to submit an assignment plus a reflection to their ePortfolio. Academic units can propose and offer courses that meet this requirement. Courses may be Pass/Fail or Graded.

Additional rules:

- Courses in this category are envisioned to have an emphasis on activity, doing, or performing, rather than traditional classroom learning.
- Students must take at least 3 different classes (so a single 3 cr course could not completely fulfill this requirement).
- Students may repeat 0.5 credit courses once.
- 1-credit (or higher) courses may not be repeated to meet this requirement.

ePortfolio

Supporting integration

To help achieve our goal of encouraging students to make connections throughout the curriculum, we propose including an ePortfolio component in all Essential Education courses. The American Association of Colleges and Universities (AAC&U) [lists ePortfolios as one of eleven high impact practices \(HIP\)](#), and in fact suggests that ePortfolios can enhance the effects of other HIPs when used in conjunction with them. Students learn better and deeper when their learning experiences are connected. While we can provide clear goals, offer meaningful opportunities, and suggest thematic connections through the Essential Education Pathway,

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each student's journey is unique and requires them to take the lead in integrating their learning experiences.

As students practice articulating their learning in their ePortfolios, they are prepared to talk about what they have done in their academic work when they are speaking with prospective employers or applying for graduate or professional schools. They also become reflective practitioners in their professional lives, able to continue to learn and apply their experience in new directions. Students will be able to take their ePortfolio with them after graduation.

Documenting learning

In each Essential Education course, students will add to their ePortfolio "file cabinet" by creating pages that include an assignment and reflection from the course. The act of curating the ePortfolio page not only encourages reflective learning but also is a mechanism to help students construct knowledge and has been shown to [support student learning and engagement](#).

For an excellent overview of the efficacy of ePortfolio pedagogy in general and specifically applied to science courses, see: [Reflecting, Integrating, and Communicating Knowledge Through ePortfolios to Increase Civic and Scientific Literacy](#)

At key points in the Essential Education program, students will curate a broader "showcase" ePortfolio:

- In the Michigan Tech Seminar they will map out personal and academic plans using the university student learning goals as inspiration, encouraging student ownership of learning from the start of their Michigan Tech career.
- As part of their Essential Education Experience or Essential Education Minor, students will document and demonstrate integration of learning across the Essential Education curriculum, and reflect on the connections between the Essential Abilities, their major courses, and their future career plans.

Our proposed ePortfolio platform would be integrated into Canvas and would also allow degree programs to leverage the tool for their own department purposes. ePortfolio support will be provided for faculty, including models and templates for a variety of reflection prompts, technical support for faculty (and students) with the ePortfolio platform, and professional development opportunities related to incorporating reflection and folio thinking into the classroom.

Assessment to Improve Student Learning

Assessment is a systematic process for the continuous improvement of student learning. It enables the university community to identify opportunities to improve courses and curricula, teaching practices, and student life activities, as well as make informed decisions about academic programs.

Reducing the number of learning goals and performance criteria is the first step in simplifying assessment at Michigan Tech.

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The details of the new assessment process are beyond the scope of this proposal. However, the Essential Education framework has been designed to ensure coverage of the new Essential Abilities (performance criteria) while also giving Essential Education instructors more choice about what is assessed in their classes. It is our goal that the assessment should provide meaningful feedback to individual instructors so they can make adjustments (as needed) to help their students achieve learning outcomes. The new program structure and assessment process will also support student learning by bringing together Essential Education instructors who support the same performance criteria or learning goal and providing them with targeted professional development opportunities and support.

Regarding degree 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. Instead, we hope that the alignment between the USLGs and disciplinary learning goals (such as those in ABET) will mean that departments with external accreditation processes can leverage Essential Education assessment as part of their own process to the extent to which it is helpful. Departments without goals and/or processes set by a professional accreditor can use the Essential Education goal resources and assessment processes to support and inform their own program assessment to the extent they find it useful.

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. Reducing the number of USLGs and performance criteria, and streamlining the Essential Education program, are important steps in improving assessment at Michigan Tech.

Essential Education Assessment Leadership Teams

We propose a reduction in the number of learning goal assessment committees. Our present system has six learning goal committees, each with five or six members. We recommend instead the formation of two leadership teams aligned with our four undergraduate student learning goals. Each leadership team would be composed of four to six members drawn from units that contribute to their respective learning goals. **This reduces the number of faculty serving on Essential Education assessment committees from around 30 in our current system to 8-12.** The two proposed Essential Education Assessment Leadership Teams will be:

Think Critically and Communicate: leading assessment work for the following Essential Abilities (performance criteria):

- Question Assumptions
- Evaluate Information

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- Analyze Ethical Implications
- Communicate Quantitatively
- Communicate Contextually
- Foster Collaboration

Adapt and Transform leading assessment work for the following Essential Abilities (performance criteria):

- Reflect
- Welcome Challenge
- Explore Diverse Perspectives
- Engage in Civic Life
- Innovate Solutions
- Create

As mentioned above, we propose reducing the number of undergraduate student learning goals to four with an overall total of twelve Essential Abilities (performance criteria). We are also proposing more flexibility for departments and instructors to determine which undergraduate student learning goals are most appropriate for their courses. Some Essential Education course categories are linked to specific learning goals, but most have more flexibility to choose. The reduction in the number of performance criteria helps ensure greater coverage of them across the overall Essential Education program.

Some Essential Education course categories will be assigned specific Essential Abilities:

- **Michigan Tech Seminar** courses will assess Reflect [Adapt]
- **Composition or Read-Write-Engage** courses will assess Communicate Contextually [Communicate] and Evaluate Information [Think Critically]
- **Communication-Intensive** courses will assess Communicate Contextually [Communicate]
- **DEIS courses** will assess Explore Diverse Perspectives [Adapt]
- **Essential Education Experiences** will assess one of the Transform Essential Abilities

All other courses will be required to assess one Essential Ability and will have the option to choose from among a subset of the twelve Essential Abilities.

Assessment Process

To make sure assessment is happening in the places where it can produce actionable results, we propose that assessment will take place in groups of related courses (most likely within a department). Instructor assessment/course group assessment puts assessment results directly into the hands of those who can immediately make changes to improve student learning.

Faculty in the course group will have options for the assessment process:

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1. Individual instructors could assess their own course by analyzing student work and reflecting on the results—groups would then collect instructor reports, make an action plan, and report to the goal leadership team
2. Course groups could themselves do assessment of a selection of student work products, make an action plan, and report to the goal leadership team

Instructor-based course assessment has been on-going in our current Goal 2 (Knowledge of the Physical and Natural World) assessment. Recent pilots of instructor-based course assessment in some sections of Goal 3 (Global Literacy), Goal 4 (Critical and Creative Thinking), and Goal 5 (Communication) courses have demonstrated the value of this approach and its applicability beyond math and science courses.

One weakness of our current system is the lack of opportunities to report out, discuss, and act on assessment results. We propose that the leadership teams be encouraged to proactively engage faculty in these conversations and to provide faculty across campus with resources to address the undergraduate student learning goals in their courses. We would like to see an annual “Student Learning Summit” on campus where assessment efforts and results are used to prompt faculty discussion and development of action plans to improve student learning. The Student Learning Summit could also be a place where excellent student work can be showcased through ePortfolios (perhaps including awards for outstanding ePortfolios).

Faculty engagement in Essential Education assessment

Instructors of Essential Education courses will be expected to contribute to assessment in the following ways:

- Addressing and assessing one of the Essential abilities in each Essential Education course they are teaching, either through individual course-based assessment or course group assessment
- Requiring their students to complete an ePortfolio page (assignment + reflection) for each Essential Education course they teach. ePortfolio pages may in some cases be used as an additional source of student data for program assessment
- Essential Education Assessment leadership teams may ask instructors to participate in activities that contribute to assessment across units and take part in opportunities for sharing and reflecting about assessment results.

How Essential Education Supports Credit Reductions

All majors will benefit from a reduction in general education credits.

Currently, all majors on campus are required to take 27 credits of Core, HASS, and co-curriculars that may *not* be double counted with major requirements. In Essential Education, this is reduced to 24 credits, a credit savings that will benefit all majors on campus. Courses formerly offered as co-curricular units will become curricular credits as part of a broader category, “Activities for Well-being and Success,” which includes additional courses addressing mental health and well-being, leadership, and personal development.

The rules for double counting are changing, providing more flexibility for programs and for students that change majors.

Currently, majors may double count all of their general education STEM courses with their major requirements, but may not double count any of their HASS credits. In the new system, majors have flexibility of choice about which of the 13 Essential Education requirements they will satisfy through major requirements. This will ensure equity across majors.

Rather than thinking about double counting credits, it is more straightforward to think about how major requirements can satisfy Essential Education requirements. This is due to the fact that some majors require specific math or science courses that are more credits than the number required by Essential Education.

In total, the Essential Education program has 13 requirements as shown in Figure 1. Programs may satisfy the Michigan Tech Seminar requirement and up to 5 other requirements through their major requirements.

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

The new Math (1), Science (1), and STEM (2) requirements can all be satisfied by major courses that are currently on the STEM list.

Programs that currently satisfy all STEM requirements within the major may be able to satisfy one additional Essential Education requirement through a course (or courses) in their major that are also on one of the following lists: SHAPE, Essential Education Experience, or Activities for Well-being & Success.

Many students will be able to satisfy one course on the pathway (distribution or Essential Education Minor) through technical electives that already appear on their degree audits. For example, many engineering programs already include EC 3400 Economic Decision Analysis (which will be on the SHAPE list) as a technical elective.

How Essential Education Supports the Michigan Transfer Agreement

For transfer students with an MTA-satisfied transcript, all Essential Education requirements will be considered complete. As students must meet the total credits required for their degree, this may require additional free elective credits.

Students who use the MTA for planning purposes with the intention of transferring to Michigan Tech (without completing the full MTA) will find that the MTA requirements articulate well to Essential Education requirements. See ["Transition Issues"](#) in Appendix A.