THE UNIVERSITY OF MAINE
Graduate School

Graduate Board
Thursday, January 27, 2022

By Zoom:

Join Zoom Meeting
ID: 81598007492
Passcode: 040737

3:00-4:30 pm

AGENDA

1. Review/approval of the November 18, 2021 Graduate Board minutes

2. Review/approval of the January 18, 2022 Curriculum Committee report

3. Announcements/updates
    a. Reminder: Graduate School scholarship nominations due February 4, 2022
    b. Waldron, Chase and Hunter award recipients
    c. Entrepreneurial Revenue Graduate Program (ERGP) update

4. Student Success Manager - Ace Barrera

5. Export control information – Amanda Ashe

6. New Graduate Proposals

    a. Graduate Certificate in Climate Studies – Katie Glover
    b. MS in Engineering Technology – Will Manion, John Allen
    c. 4+2 Addendum in Electrical and Computer Engineering (no approval required)

7. Continued discussion of Land Acknowledgment (time permitting)

8. Items arising

THE UNIVERSITY OF MAINE
Graduate School

Graduate Board
Thursday, November 18, 2021
By Zoom and in 57 Stodder:

Join Zoom Meeting
ID: 83757786276
Passcode: 618616

3:00-4:30 pm

AGENDA

Attendance: E. Allan, P. Agrrawal, J. Artesani, J. Ballinger, J. Bolton, J. Bonnet, T. Bowden, A. Cruz-Uribe, S. Delcourt, S. De Urioste-Stone, D. Dryer, P. Edelman, S. Fraver, J. Gill, A. Goupee, H. Greig, V. Herbert, K. Huguenard, S. Klein, M.E. Camire, A Knowles, K. Kreutz, P. Libby, Z. Ludington, J. McClymer, C. Murphy, S. Ohno, E. Pandiscio, L. Rickard, J. Romero Gomez, D. Rooks-Ellis, J. Stoll, T. Yoo, Z. Zhang, Y. Zhu.

Guests: Olivia Bamford, Higher Ed Student; Crystal Burgess, Director of Graduate Communications; Fiona Libby Director of Graduate Student Recruitment; Jason Bolton, Innovation Engineering.

Meeting called to order – 3:05pm

1. Review/approval of the October 28, 2021 Graduate Board minutes
   a. Patty Libby Moved to approve the minutes
   b. Elizabeth Allan - 2nd
   No discussion; unanimous approval

2. Review/approval of the November 2, 2021 Curriculum Committee report

   New Courses:

   SFR 556 - Physical and Mechanical Properties of Sustainable Materials

   Modifications:

   BIO 504 - Advanced Developmental Biology

   FSN 501 - Advanced Human Nutrition

FSN 506 - Nutritional Assessment

FSN 508 - Nutrition and Aging

FSN 530 - Integrative and Functional Nutrition

Patty Libby – motion to approve
Jim Settele – 2nd
No discussion; unanimous approval with one abstention
(Mary Ellen Camire abstained)

3. Announcements/updates
    a. Reminder: Graduate School assistantship and fellowship nominations due December 10. Chase, Waldron, Hunter, and Shared TAs.
    Nomination instructions are on the Graduate School site (faculty staff page)
    https://umaine.edu/graduate/facultystaff-resources/financial-awards-nominations

    b. Student Success Manager update
    The Graduate School has identified 2 finalists, with hopes of making an offer in the next couple of weeks.

    c. IT update – UMS is working with campuses to determine how to move forward with the Salesforce (TargetX) customer relations management system and decision module. Specifically, whether to have a single unified Org under the UMS direction – or to stay in separate orgs (as is) for each UMS campus.
        i. Separate RFP for the UMS was awarded to Salesforce – so there is possibility of economies of scale by joining a unified Salesforce org.
        ii. Governance has not yet been resolved.
        iii. Next steps: Demo of current progress under the unified org, (Augusta, USM, and UMaine are not yet in the unified org.)
        iv. We are hoping the UMS will purchase as an enterprise license which will save the Graduate School a significant amount in licensing fees.

    d. Upcoming dissertation writing workshops:
        i. Charlsye Smith Diaz - one day Zoom workshop
        (https://www.writewhenready.com/workshops/dissertation-in-a-day-workshop)
        Jan Allen, Associate Dean, Cornell – workshops early next year open to UMaine students as well
        (https://cornell.ca1.qualtrics.com/jfe/form/SV_afPgaq3718p3xdQ)
        Both workshops are free for grad students – just need to register using the links above.

e. Winter clothing drive to benefit International Graduate Students in cooperation with Gold Star Cleaners. Once cleaned, clothing will be provided to OIP for distribution as needed. Deadline is Dec 1 to donate clothing and/or money for this. Contact: Trish Perry, Graduate School, 581-3291

4. Graduate Certificate in Innovation Engineering – Jason Bolton, Foster Center for Innovation

The 9 credit innovation engineering graduate certificate employs a systems approach to innovation. Principles of the certificate curriculum may be used to creatively think about graduate student research ranging from STEM fields to the arts and humanities. Please share with graduate students in your program. For more information, see: https://umaine.edu/innovation/innovation-academic-programs/
Josh Stoll asked if there was interest in partnering with other departments – Jason Bolton indicated that there is. There is flexibility in the innovation engineering approach. Framework can be applied to any research project or program.

5. GSG Grants –

College financial managers have been notified to expense the charges for students awarded GSG grants to the Graduate School. It is assumed that students will use Concur to document their expenses. Questions may be directed to Rebecca Kennedy.

6. Continuing vaccination policy of the University. January 18 - deadline for spring admits to upload vaccination cards or apply for exemption.

7. UMaine Arts Initiative

Scott introduced Assistant Vice President for Research and *ex officio* member of the Graduate Board, Sandra De Urioste-Stone, who is currently coordinating the UMaine Arts Initiative through the Division of Research and Graduate Studies. The University of Maine Arts Initiative is a collaborative of faculty, administrators, staff, and students committed to the principle that the arts play an integral role in public research institutions.

Involves faculty at both UMaine and UM-Machias
There is a 12 member steering committee including Laura Artesani (UM), Bernie Vinzani (UMM) comprised of representatives from 9 academic units including music, theatre, intermedia, literary arts, and digital curation.

Initial seed grant to promote cross-campus collaborations in the arts.
Due date - December 1, 2021
Grants = $5,000-$10,000
For more information:
https://arts.umaine.edu/
https://umaine.inforeadv4.com/#competitionDetail/1854969

8. Postdoctoral Research Associate Survey – Sandra De Urioste-Stone

More support for post-docs support is needed at the University.
Sandra plans to conduct a baseline survey for postdoctoral associates.
What things are working well & what are the urgent needs?
Demographic information will also be collected.
Results will be shared throughout the OVPRDGS.
https://www.nationalpostdoc.org/
Great way to connect and gain access to resources – the University is now a member.

Anne Knowles – how many post docs are there here & where are they?
Sandra said she is working with HR to determine. Not every post-doc has a title of postdoctoral research associate.
VPR Varahramyan is trying to get a better handle on the number of post docs because it is one of the criteria used in the Carnegie ranking system.

A. Cruz-Uribe asked – can post docs submit proposals as PI's? It depends on the funding agency, but both J. Gill and A. Knightly responded that post-docs in their units have applied for NSF funding.

Juan Romero – added that it may be more difficult for international post docs to get national grants.

9. Draft language on outside work for GAs – proposed revision to Graduate School policy 15.2 on assistantships

S. Delcourt presented a revised version of Graduate School policy 15.2 which attempts to address some of the concerns raised at the previous Graduate Board meeting:

> Although assistantships are part-time positions, it is expected students are working full-time on the combined primary workload of their assistantship, coursework, and/or thesis or dissertation. Moreover, some funding sources (e.g., federal grants) do not permit outside employment, and similarly, international students must follow federal visa requirements regarding maximum employment hours. For these reasons, the default Graduate School policy is that Graduate Assistants may not normally be employed in any capacity other than their assistantship, inside or outside the University during the academic year. However, individual departments/units may have policies that allow exceptions to this rule, as long as they do not violate the maximum 30 hrs/week (i.e., 10 hrs/wk beyond a half-time assistantship) for any Graduate Assistant, specific grant policies, or federal visa requirements governing student employment during the academic year.
>
> Graduate Assistants should consult their departmental student handbook or Graduate Program Coordinator to find out if there are departmental policies related to outside employment. In the absence of such policies, any requests for additional employment or changes in employment should be discussed first with the student's faculty advisor and/or assistantship supervisor/project Principal Investigator (PI). If approved by the advisor/supervisor/PI, the request also must be reviewed and approved by the graduate program coordinator and the Graduate School, and must adhere to all University and any other applicable policies (e.g. funding agencies) that are relevant to the additional employment.

He noted that this version defers to policies on additional GA work created by individual graduate programs.

Given that some programs freely allow students to work additional hours while other programs have struggled to ensure that students devote appropriate effort to their assistantship and in their studies, does the revised policy strike the right balance

Jim Settele – the revised policy addresses the concerns and allows the programs to add to the policy. Jim suggested that Jamie may have additional concerns.

Scott mentioned that he has reached out to Jamie regarding the revised policy, since she had raised concerns at the previous meeting.

Jim Settele – motion to approve
Sandy Butler - 2nd
No further discussion
Motion passed unanimously with 2 abstentions
(Terry Yoo, Sharon Klein – abstained from vote)

10. Items arising

S. Delcourt reported that the Department of Wildlife Ecology raised a question on whether the Graduate School should require a land acknowledgement statement as a standard statement in UMaine theses and dissertations.

Sharon Klein suggested the DEI committee approved statement:

> *The University of Maine recognizes that it is located on Marsh Island in the homeland of Penobscot people, where issues of water and territorial rights, and encroachment upon sacred sites, are ongoing. Penobscot homeland is connected to the other Wabanaki Tribal Nations— the Passamaquoddy, Maliseet, and Micmac—through kinship, alliances, and diplomacy. The University also recognizes that the Penobscot Nation and the other Wabanaki Tribal Nations are distinct, sovereign, legal and political entities with their own powers of self-governance and self-determination.*
> (https://umaine.edu/about/university-of-maine-land-acknowledgement/)

Should the Graduate School adopt this or alternative standard language in theses and dissertations?

Dylan Dryer suggested: Students should also be encouraged to modify this appropriately to reflect their own experiences and frames of reference if they want to.

The Graduate Executive Committee will discuss alternatives and bring them back to the Graduate Board.

Meeting adjourned at 4:15 pm.

CURRICULUM COMMITTEE REPORT

The Curriculum Committee met on January 18, 2022 and is recommending the following courses to the Graduate Board for approval at its January 27th meeting.

New Courses:

BIO 529 Plant-Insect Interactions

ECO 503 Experimental Economics

NUR 527 FNP Care of Adults II -Clinical

Modifications:

SED 506 Assessment and Program Planning In Early Childhood Intervention

SED 521 Center-Based Practicum and Seminar in Early Childhood

SED 655 Graduate Project in Early Childhood Intervention

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January 12, 2022

Dear Dr. Varahramyan,

We are pleased to submit a proposal for a new online Graduate Certificate in Climate Studies program. This has been developed in consultation with the Division of Lifelong Learning and faculty at the Climate Change Institute.

We have observed a clear need for professional development and building climate science expertise for a diverse potential student population. As part of this proposal package, we include evidence that offering an online Graduate Certificate in Climate Studies is timely for two reasons: 1) comparable programs in New England are currently limited, and 2) an online modality would serve a wider population of graduate and professional students in the state of Maine.

The Climate Change Institute currently has a Graduate Certificate in Interdisciplinary Climate Studies, with in-person courses designed for graduate students enrolled in degree-granting graduate programs. We envision the new, online Graduate Certificate described in this proposal as a separate pathway, serving students who are working professionals and not concurrently enrolled in a degree-granting academic program at University of Maine. Faculty for select courses have agreed to offer an online version to satisfy core requirements. We have also conceived a new online course to satisfy core program requirements, as well as utilizing an elective targeted to K-12 educators.

This proposal package includes an overview of the program rationale, course requirements, demonstrated need with a summary of our marketing research and survey results, course descriptions, and available resources.

Please let me know if you have additional questions or require additional information.

Sincerely,

Katherine Glover
Associate, Climate Change Institute

CC: Scott Delcourt, Associate Vice President for Graduate Studies
Paul Mayewski, Director, Climate Change Institute
Karl Kreutz, Director, School of Earth and Climate Sciences
Monique LaRocque, Associate Provost, Division of Lifelong Learning

Approval Page for Graduate Certificate in Climate Studies:

January 12, 2022

Katherine Glover, Associate, Climate Change Institute
(Person(s) Responsible for Program Plan)

21 January 2022

(Director, Climate Change Institute) (Date)

Monique LaRocque January 24, 2022

(Associate Provost, Division Lifelong Learning) (Date)

(VP for Research and Dean of the Graduate School) (Date)

(Provost) (Date)

(President) (Date)

1. **Program Title:**
   Graduate Certificate in Climate Studies

2. **Planning Committee**
   Katherine Glover, Climate Change Institute
   Karl Kreutz, School of Earth and Climate Sciences
   Paul Mayewski, Climate Change Institute
   Rachel Mathieson, Division of Lifelong Learning
   Patricia Libby, Division of Lifelong Learning
   Dagmar Moravec, Division of Lifelong Learning

3. **Program Objectives**

   a. Overview

   We propose establishing a Graduate Certificate in Climate Studies that is supported by Climate Change Institute faculty and the Division of Lifelong Learning. It is designed to serve students from a wide variety of professions, including K-12 education, management, and policy sectors. Earning this Certificate will entail nine credits, and be delivered largely online.

   Content for the Certificate will target three key knowledge areas in climate studies: the physical science basis, climate-biosphere interactions, and practical application. Contemporary issues, societal impact, and best practices for communicating climate change are themes incorporated into all course offerings. In its initial years (AY 2022-2023 and 2023-2024), we anticipate two electives for the Certificate are designed for K-12 educators. One of these will be a summer workshop for educators, with a pilot offering in Summer 2022.

   b. Rationale

   Climate change is already impacting northern New England, with anticipated impacts to Maine's fisheries, timber industry, and economy. Several of the Climate Change Institute's (CCI) faculty have been involved in the Maine Climate Council since 2019, a government initiative to create a four year climate action plan for the state. Understanding climate change science and its role in adaptation will be critical for Maine's 21st century workforce across a variety of job sectors that include businesses, government decision-making, and education.

   CCI is already renowned for its competitive graduate academic programs and research that spans local, national, and global issues. Adding a graduate distance education program provides an opportunity to expand its climate studies education to a wider audience of professionals and educators. This will benefit the scientific literacy of our citizenry, and an adaptive workforce.

c. Eligibility Criteria

An earned baccalaureate degree from an accredited program is required for admission, with a minimum grade point average of 2.5 for all candidates. A minimum TOEFL score of 80 (IbT), 6.5 (IELTS) or 60 (PTE Academic) is required for international students.

d. Learning Objectives

Program requirements that lead to the Graduate Certificate in Climate Studies will satisfy the following learning objectives. While pursuing the Certificate, students will:

1) gain an understanding of the Earth's physical and chemical climate system;
2) gain an understanding of the relationships among climate, ecosystems, and humans;
3) develop basic proficiency with climate analysis tools;
4) strengthen key professional skills in interdisciplinary science, including communication to various audiences, collaborative skills, and proposal development.

4. Evidence for Need

Below, we show a substantiated need and interest for climate change-centered programming, with growth in comparable programs. Trainings on the topic hosted by northern New England non-profit organizations have also grown. As the state's largest public higher education system, the University of Maine is uniquely positioned to offer its own program. Broadly speaking, enrollment in workforce development courses has increased across the state during the COVID-19 pandemic (Loftus, 2021).

a. Workforce Needs - Burning Glass Reports

During the SP21 semester, the Division of Lifelong Learning conducted marketing research to assess need for the proposed Graduate Certificate in Climate Studies. Burning Glass does not yet have a Classification of Instructional Programs (CIP) code from the Department of Education for "climate," so the following results are based upon keyword searches for fields that overlap with climate science. These include Political Science, Geography, Environmental Science, Anthropology, Geology/Earth Science, and Sustainability Studies. The geographic setting for this marketing analysis was nationwide. Results of this analysis show that the number of Master's degrees conferred in most of these fields has grown 9 - 15% over the past five years, with an exceptional increase in Sustainability Studies of 134%. By 2028, job growth in these fields is expected to be 3.6 - 9.9%.

b. Target Audience

We envision that climate change content and the opportunity to earn professional credit towards a graduate certification has wide appeal and demonstrable need across a range of commercial, government, policy, educational, and non-profit job sectors. K-12 educators are one audience that has shown enthusiasm and interest in climate change trainings that

could be offered on short-term (i.e. multi-day workshop, accelerated summer course) and long-term (i.e. coursework over an academic year) timescales. Electives outlined below would be offered in the initial pilot years of the Certificate that are designed specifically for educators. During FA21, we designed and sent a survey to grade 7-12 science and math teachers throughout Maine and other partners. With 162 responses, educators expressing the following interests:

- asynchronous or hybrid coursework for the Graduate Certificate (81.9% of respondents).
- asynchronous or hybrid modality for a summer workshop (60% of respondents).
- earning professional development or graduate credit (80% of respondents).
- 62.3% of respondents expressed that they were “likely” or “highly likely” to pursue this programming.

Topics with the most interest (at least half of the respondents) included adapting climate change content for the classroom, energy resources, climate data literacy, and impacts to local food systems. Launching the summer workshop this year, and the Graduate Certificate in FA22 is timely. Maine’s Department of Education is set to release new K-12 climate change curriculum to the Maine Online Opportunities for Sustained Education (MOOSE) platform this spring, as part of the “Maine Won’t Wait” four-year climate action plan.

c. Comparable Programs

i. Graduate Certificates at U.S. Higher Education Institutions

Nationwide, seven universities offer online graduate certificates in climate studies (Table 1). These programs range from 9-20 learning credits and vary in specialization, including topics such as forestry, climate change leadership, and international policy. Programs at northeastern institutes are listed first, and University of Maine (this proposal) is listed for comparison at the end.

Table 1. At-a-glance program specs for nationwide online graduate certificate programs in climate studies, with northeastern programs listed first, and proposed program at University of Maine listed at end. Approximate tuition cost for University of Maine calculation from current rates posted under "Tuition and Fees" for UMaine Online (https://online.umaine.edu/tuition-and-fees/)

Institution	**Program**	**Credits requirements and approximate tuition (FA21 rates)**	**Modality**
Harvard Division of Continuing Education, Extension	Environmental Policy and International Development Graduate Certificate	4 courses over 1.5 years, $11,600	online, synchronous
School of Public Health, Yale University	Climate Change and Health Online Certificate Program	$900 per course, $2000 total for all three course offerings	online, blended synchronous/asynchronous
Penn LPS Online, Univ of Pennsylvania	Certificate in Climate Change	4 courses @ $2,432/course	online asynchronous (majority) with some synchronous
Oregon State University ecampus	Forests and Climate Change Graduate Certificate	20 credits @ $560/credit	online (majority) with some hybrid
North Carolina State University Distance	Certificate in Climate Adaptation	12 credits @ $462/credit (residents) or $1311/credit (nonresident)	online
University of Washington	The Graduate Certificate in Climate Science	17 credits @ $488-560/credit	on-campus
American Public University	Graduate Certificate in Climate Change Awareness and Leadership	18 credits @ $250-370/credit	online
University of Maine *(this proposal)*	Graduate Certificate in Climate Studies	9 credits @ $541/credit (resident) or $1623/credit (nonresident)	Online (majority) with summer workshop option

ii. Recent workshop programming in northern New England

Our online Graduate Certificate in Climate Studies is unique in targeting the needs and professional development of K-12 teachers. We see both a programmatic need, and have gotten feedback on interest from both local teachers and the Maine Department of Education. One of our proposed elective course offerings that can count towards the Graduate Certificate is a summer workshop for educators focused on climate change content. We looked for recent programming in northern New England that was 1) targeted to

educators, 2) workshop, summit, or institute-type events that lasted one to several days, and 3) focused on climate change-related content. We noted that it is largely non-profit organizations spearheading such programming, rather than higher education institutions.

Table 2. Summary of recent climate change-related workshop programming for educators in northern New England.

Event Name	**Hosting Organization**	**Dates**
Equity & Integration in Science Education (virtual conference with "Sustainability and Action" content)	Vermont Science Teaching Association	Jan 17 - 21, 2022
Climate Education Retreat	The Climate Initiative (formerly Kennebunkport Climate Initiative)	Aug 10-13, 2021
Workforce Pathways Conference (with "climate resilience trades" as one of the strands)	Island Institute	Oct 7-8, 2021
Maine Climate Education Summit	Maine Environmental Education Association	June 2021
various multiday workshops and professional development for educators	Vermont Energy Education Program	ongoing

iii. Summary

The results of our marketing research show that there is widespread, recent interest in climate change content in northern New England. However, affordable graduate offerings as continuing education programs are scarce at institutions of higher education in our region. This is a timely opportunity for the University of Maine to satisfy a growing demand.

5. Program Content

a. Program of Study

Students who earn this Graduate Certificate will have demonstrated their understanding of the physical principles that underpin Earth's climate system, Earth's biologic response to climate change, the societal impacts of climate change, and practical application of the material. A summary of course offerings, requirements, and electives that count towards the 9-credit certificate are detailed in Table 3.

All courses will be offered online through the Division of Lifelong Learning, and listed with appropriate units (e.g. School of Earth and Climate Sciences, Dept of Anthropology, the Climate Change Institute, School of Biology and Ecology, Ecology and Environmental Science, School of Learning and Teaching).

Table 3. Summary of program of study for the Graduate Certificate in Climate Studies

Graduate Certificate in Climate Studies
9 credits, including: 1) **ERS 542:** Atmosphere, Ocean, Ice and Climate Change (3 credits, required) 2) <u>One</u> of the following: **BIO or EES 5xx:** Contemporary Issues in Global Biodiversity (3 credits) **ANT 530:** Human Dimensions of Climate Change (3 credits) 3) <u>One</u> of the following practical application courses: **INT 500:** Interdisciplinary Applications of Climate Science **INT 500:** Univ of Maine Climate Change Workshop - Climate Change Teaching Tool **ESC 556:** Climate Change Education

b. Course Descriptions

Faculty affiliated with CCI have agreed to carry out instruction of courses, which we anticipate offering annually. Elective course ESC 556 is one exception that is a new, semester-length course with School of Learning and Teaching faculty. Currently, it is offered biennially, with enrollment preference for students already enrolled in the M.Ed. program in Curriculum, Instruction and Assessment. Any remaining spots will be available to students that are pursuing this Certificate.

ERS 542 Atmosphere, Ocean, Ice and Climate Change (3 credits)

This course covers Earth's climate system, including heating of the Earth by solar radiation, radiation balance, composition and circulation of the atmosphere and ocean. Geographic distribution and motion of ice is covered, as well as feedbacks between components of the climate system. Past changes in the radiative forcing, atmosphere, ocean, and ice on Earth. Climate change will be discussed on time scales ranging from years to millions of years.

Learning objective(s) addressed: 1

BIO or EES 5xx: Contemporary Issues in Global Biodiversity (3 credits)

This course provides students with an introduction to ecosystem function and threats to global biodiversity. Foundational ecological and environmental topics such as natural selection, basic genetics, general earth history, and the organization and history of life are covered as we examine global patterns of biodiversity, the evolution of biodiversity, threats to biodiversity, and strategies for management and conservation. With this foundation, we will then examine contemporary topics and issues in conservation biology, including the impact of colonialism on

scientific practice and species loss, best practices for land management, and how deforestation affects global health.

Learning objective(s) addressed: 2

INT 500 Interdisciplinary Applications of Climate Science (3 credits)

This is a course focused on a current, interdisciplinary topic in climate sciences, such as change in the Arctic, communicating climate risk, and the future of energy resources. Through this theme, students will explore the physical, chemical, biological, and human dimensions of this issue. Students will learn key skills, including:

1) Data visualization
2) Climate tools (appropriate at interdisciplinary level)
3) Presentation and communication (media training, policy) skills
4) Interdisciplinary collaboration
5) Project & proposal development

Learning objective(s) addressed: 3, 4

ANT 530 Human Dimensions of Climate Change (3 credits)

Multi-disciplinary overview of selected social science topics on humans and climate change. Critical anthropological attention to what this literature overlooks and how these omissions can be dealt with. Students learn about the importance of inclusive and participatory process in partnering with stakeholders to produce data and policy that is socially relevant and responsive.

Learning objective(s) addressed: 2, 4

ESC 556 Climate Change Education (3 credits)

The purpose of this course is to provide students an overview of climate change science and develop skills, knowledge, and dispositions associated with teaching climate change in science learning settings to a wide range of learners. In support of this work, the course provides opportunities for students to draw from their teaching experiences to implement specific approaches to teaching climate change, including but not limited to honing teaching strategies to address alternative conceptions, engaging with education research on this topic, designing a lesson to align with current research on climate change education, and reflecting on their own learning about climate change education.

Learning objective(s) addressed: 4

INT 500: **University of Maine Climate Workshop - Climate Change Teaching Tools** (3 credits)

Designed for educators, course objectives include enhancing knowledge and skills on different aspects of climate change. Course themes may include skill-building in teaching and communicating climate science content to diverse learners, integrating climate data into educational modules, and local impacts of climate change. This course is a hybrid online and in-person course, with a period of online study and assignments, and a two-day workshop.

Learning objective(s) addressed: 3 & 4

c. Development of New Courses

Two of the proposed courses (BIO or EES 5xx and INT 500: Teaching Tools) are not yet approved, though both have been in the planning stages since FA21. In our survey targeted to educators, 41% of respondents expressed interest in the topic of critical biodiversity issues, demonstrating interest and need for such a course.

Upon approval for this Graduate Certificate proposal, we will then seek approval of these courses with an experimental course number for their first offering. Course proposals will include evidence for interest, and modifications based on student evaluation and feedback from the first offering. We intend to follow all formal course proposal processes within the appropriate teaching units, with the Graduate School, and with the Curriculum Committee.

6. Program Resources

Courses will be taught by CCI faculty, according to interest and expertise. CCI has several postdocs and soft money research affiliates that would be available to teach courses, depending on scheduling and demand. ESC 556 is offered biennially by School of Learning and Teaching faculty as a semester-length course. As space in the ESC 556 permits, students pursuing this Certificate can take it for credit towards the practical application requirement.

CITL is available to assist with course adaptation and module building on BrightSpace, as well as offering regular training on best practices for online pedagogy. All enrolled students have access to extensive electronic resources and databases through Fogler Library, and we do not anticipate additional requirements for library resources. The Division of Lifelong Learning will fund courses taught as overload for tenure-track faculty.

7. Program Evaluation

Program evaluation will occur annually to ensure that the Certificate program:
1) is financially solvent;
2) is meeting its stated educational objectives based upon syllabi and student work;
3) meets faculty capacity to teach courses;

4) leveraging potential partnerships with other campus units and programs;
5) meeting student needs for rigor, content, and scheduling, as expressed in course evaluations and targeted surveys.

If enrollment declines or the program is deemed to not be meeting its stated objectives, the planning committee will discuss future adaptation or discontinuation of the Certificate.

8. References

Loftus, Sawyer. November 23, 2021. “Officials say adult education is growing in Maine, despite COVID.” Bangor Daily News. Retrieved December 2, 2021 from: https://bangordailynews.com/2021/11/23/news/officials-say-adult-education-is-growing-in-maine-despite-covid-joam40zk0w/

Master of Science Degree in Engineering Technology (ET)
Concentrations in EET and SVT
University of Maine
December 8, 2021

PROPOSAL FOR NEW GRADUATE DEGREE

MS Degree in ET (with concentration options)

Concentrations:

Initially, the MS in ET will have two concentration options:

1. Electrical Engineering Technology (concentration in EET)
2. Surveying Engineering Technology (concentration in SVT)

Other Potential Concentration Options:

Other concentration options may be added should individual engineering technology degree programs pursue the MS. These new options will submit applications for approval.

Background:

The MS in ET degree consists of 9 required credits in internship (application) and project management. The remaining 21 credits must be chosen within a concentration area (listed above). These 21 credits can be customized to help fulfil your career goals and objectives. The MS degree in ET will not only help you become a better engineer, but it will also help prepare you for project management roles as well.

With permission, other courses may be substituted for those listed for a track. Prior graduate courses that have been taken by students will be considered on a case-by-case basis.

Justification:

Working professionals in the engineering technology field have very few options in terms of advanced degrees or continued professional development (without taking unrelated prerequisite courses required by most MS degree programs). This program is designed to allow ET graduates to enter directly into a concentration program and take courses online while working full time in industry. In fact, direct work-related projects are required as part of the 6-credit internship course (towards the end of your program degree).

Distinction of the MS in ET Degree from the University of Maine

Most MS programs – especially in engineering – focus on the theory of technology and how to advance that technology. This program will focus on the application of already-existing advanced technology. It is an application-based degree program. Students in this program – if not already Professional Engineers – will be better-prepared to take the licensing exam in their field. Like the University of Maine's undergraduate program in Engineering Technology, the MS in ET program faculty will work closely with industry to ensure that students are provided "hands on" experience with today's technology and applications. The EET and SVT programs (concentration areas) have strong ties with industry, especially in Maine and New England. These industrial connections allow faculty to keep their courses current with cutting-edge technology and applications used in industry.

Target Audience:

The MS in ET is intended for students who have a BS in engineering or engineering technology who want to advance into upper-level technical or management positions. The degree combines advanced engineering technology disciplines with applications and a field component. These courses can also be used for continuing education for professional engineers.

Program Information:

The MS in ET is fully online and requires 30 credits to complete. **Students must pick a concentration**.

Required Courses for all MS in ET Majors (must take both; total of 9 credits):

a. GEE 694: Professional Science Master's in Engineering and Business Internship (6 credits) (this course is typically taken at the completion of your coursework)
b. ENM 586: Advanced Project Management (3 credits)

EET Concentration (must take seven courses; at least four must be EET courses):

(EET has finalized their course work for the program and has submitted all the paperwork for the graduate course listings. Below is an approved program course listing.)

a. EET 514: Printed Circuit Board Design (3 credits)
b. EET 515: Automation and Integration (3 credits)
c. EET 560: Renewable Energy and Electricity Production (3 credits)
d. EET 584: Engineering Economics (3 credits)
e. EET 598: Selected Graduate Topics in EET I (3 credits) (to be developed)
f. EET 599: Selected Graduate Topics in EET II (3 credits) (to be developed)
g. EET 422: Power Systems Analysis (3 credits)
h. EET 423: Protective Relay Applications (3 credits)
i. MET 475: Fuel Science and Technology (3 credits)
j. MET 440: Lean Six Sigma (3 credits)
k. SVT 475: Small Business Management (3 credits)

SVT Concentration (must take seven courses; at least four must be SVT courses):

(SVT's program is up and running and a shift to MS in ET from PSM in SVT will not be an issue. Below is an approved program course listing.)

a. SVT 501: Advanced Adjustment Computations (3 credits)
b. SIE 509: Introduction to Geographic Information Systems (3 credits)
c. SVT 511: Geodetic US Public Land Survey Computations (3 credits)
d. SVT 512: Advanced Boundary Law (3 credits)
e. SVT 531: Advanced Digital Photogrammetry (3 credits)
f. SVT 532: Survey Strategies in Use of Lidar (3 credits)
g. SVT 541: Geodesy (3 credits)
h. SVT 542: Applied Hydrographic Surveying (3 credits)
i. EET 560: Renewable Energy and Electricity Production (3 credits)
j. EET 584: Engineering Economics (3 credits)
k. MET 440: Lean Six Sigma (3 credits)
l. SVT 475: Small Business Management (3 credits)

MS in ET Degree Coordinators:
Paul Villeneuve, EET Program Coordinator, School of Engineering Technology (**for concentration in EET**)
Raymond Hintz, SVT Program Coordinator, School of Engineering Technology (**for concentration in SVT**)
Will Manion, Director of the School of Engineering Technology
Dana Humphrey, Dean of Engineering
Kody Varahramyan, Dean of the Graduate School

Individual Program Support / Buy-In:
EET has finalized their course work for the program and has submitted all the paperwork for the graduate course listings (and are 100% in support of the MS program) and these courses have been approved. SVT's program is up and running and a shift to MS in ET from PSM in SVT will not be an issue (and is the preferred pathway for SVT).

Graduate Certificates:
Graduate Certificates are being developed in each of the two concentration areas (applications are complete for EET and approved and the SVT option has already been approved and implemented). All students enrolled in the MS in ET program will earn a Graduate Certificate along the way. If a student does not wish to complete the MS in ET, they can still earn a Graduate Certificate partway through the process. The programs will use SVT as a model on how to implement the Graduate Certificate as a pathway to complete the MS in ET.

Degree Focus:
The SVT PSM program will be a model for the MS in ET program (both concentration options). SVT has developed the following degree-focus information and each program will write their own focus statements as the program develops/evolves.

Changing technologies in the engineering world require working professionals to return to an academic world to expand their knowledge. Professional Engineers (with a B.S. degree in a related engineering field) and Professional Land Surveyors (with a B.S. degree in surveying or related fields) will expand on their undergraduate knowledge. Similarly, professional working engineers and land surveyors with a non-engineering or non-surveying undergraduate degree will be able to capture knowledge in their chosen second career.

- Expand your undergraduate knowledge for better work experience
- Expand your firm's knowledge base into new technologies
- Expand your knowledge for new work opportunities
- Better prepare yourself for professional licensure examinations
- Grow mathematical foundations not taught in undergraduate curriculums
- Prepare for a leadership role in solving complicated engineering issues

Marketing:
Using SVT as a model (specifically the PSM program): The amount of COE resources that have been dedicated to it is simply advertising on UMaine web sites. It is true there is support from DLL, but this is not COE resources. Usually advertising in trade magazines has come from DLL or SVT budgets. Same will most likely be true for the MS in ET program.

Financial Implications and Justification for an MS in ET Program:

Using SVT as a model (specifically the PSM program): In spring 2021 the 3-cr. 500-699 courses in COE were examined. Independent study courses were not included as they are variable credits and the amount of times they are offered is extremely variable. Number of students were simply added up for each class. SVT accounted for 20% of the student numbers. Thus, revenue from graduate courses in the current semester would have dropped by 20% if an SET program was not offering graduate classes. This is more demonstrative if one considers an SVT faculty population of three vs. faculty populations in the other programs offering graduate classes. This is further hindered by the SVT graduate student population losing 10-30% of annual interest because the candidate has no interest in the business classes of the PSM. A master's program including all SET programs is simply a guarantee in added revenue especially if it is assumed additional faculty are not added initially.

Mode of Delivery:

All courses will be online and offered in a regular sequence (at least once per year). Coordinators will work with students to create a degree plan that can be completed in a timely and predictable manner. Options for independent study will also be considered by each program coordinator.

Uniqueness of University of Maine's MS in ET Program:

An examination of existing "similar" programs finds: (1) most are very generic programs with no specific focus, (2) not 100% online, (3) no options with multiple unique concentrations at any other university, and (4) no consistent demonstration of the concept of cost saving "E tuition".

Funding Mechanism:

Multiple courses are funded by DLL and continued support is requested. Multiple courses are also part of the regular teaching load of the ET faculty. Faculty loading will be considered to ensure course availability for MS students.

Faculty Information:

All faculty in ET have online teaching experience and most have worked previously with DLL. Expanding the existing SET program to include an MS in ET will be additional work for faculty; but they are dedicated to make the program work with continued support from DLL.

School of Engineering Technology (SET) professors have a minimum of a master's degree and are all registered Professional Engineers or Professional Land Surveyors with industrial field experience. This degree is application-based; so, SET faculty are in an excellent position to use cutting-edge technology, equipment, and software to teach students the application of this technology.

Faculty loading will be discussed at the program level. This will be overseen by the SET director.

Cross Listed Courses:

Several graduate courses (in ET) are 400- and 500-level cross listed. If a student has previously taken one of the undergraduate equivalents (which may be applicable to recent ET graduates), the student must take a 1-credit graduate version of the course to cover the added content for the graduate component of each course. In that case, they must take acceptable electives to make up the required 30 credits. The replacement course can be a 400-level tech elective in the engineering department (with departmental approval). Courses in "other" MS in ET concentration areas can also be taken with departmental approval.

Eligibility Criteria:

An earned baccalaureate engineering, engineering technology, math, physics, or equivalent degree from an accredited program is required for admission. A minimum grade point average of 2.5 applies to all candidates and minimum TOEFL score of 80 (IbT), 6.5 (IELTS) or 60 (PTE Academic) are required for international students. No GRE required.

See next page for Endorsements.

Endorsements:

12/8/2021

Will Manion, Director of the School of Engineering Technology, College of Engineering

Mohamad Musavi
Digitally signed by Mohamad Musavi
DN: cn=Mohamad Musavi, o=University of Maine, ou=College of Engineering, email=musavi@maine.edu, c=US
Date: 2021.12.15 08:20:17 -05'00'

Mohamad Musavi, Associate Dean for Education and Research, College of Engineering

Dana N Humphrey
Digitally signed by Dana N Humphrey
Date: 2021.12.15 11:11:59 -05'00'

Dana Humphrey, Dean of Engineering

Monique LaRocque Monique LaRocque, 1/18/22

Monique LaRocque, Associate Provost of the Division of Lifelong Learning

Kody Varahramyan, Dean of the Graduate School

John Volin, Executive Vice President for Academic Affairs and Provost

Joan Ferrini-Mundy, President

4+2 Master's Program
Electrical and Computer Engineering
University of Maine
Oct 11, 2021

To attract more motivated students to pursue a graduate degree and also conduct graduate research, the Department of Electrical and Computer Engineering (ECE) is proposing two new Master's degree pathways as the addendum to our existing 4+1 programs: (1) a 4+2 Master's degree with thesis in Electrical Engineering and (2) a 4+2 Master's degree with thesis in Computer Engineering.

The ECE department established 4+1 Master's degree programs in 2016: 4+1 in Electrical Engineering and 4+1 in Computer Engineering. The 4+2 programs will follow the same admission requirements and process that we have already put in place for our 4+1 Master degrees. While the 4+1 degree requires students to complete the degree 15 months following matriculation, the 4+2 degree requires students to complete the degree 27 months following matriculation.

Students can move between our 4+1 and 4+2 degree programs. If a student starts in a 4+1 program and requests to move to the 4+2 before the end of the 15 month 4+1 period, then in order to apply up to 9 credits of graduate courses taken as a senior to the master's degree as well as to the undergraduate degree, the student must actually complete a thesis successfully in the 27 month period of the 4+2 program. If a student in the 4+2 option requests to drop back to the 4+1 option, s/he must complete all the requirements for the 4+1 within 15 months of finishing the bachelor's degree, otherwise the graduate courses taken as a senior may not also be applied to the master's degree. In addition, s/he cannot count ECE 699 as credits in the 4+1 program. A student may petition the Graduate School for an extension due to extenuating circumstances.

See next page for Endorsements.

Endorsements:

D. Vijaya Kumar 12/10/2021

Vijay Devabhaktuni, Chair of Electrical and Computer Engineering, College of Engineering

Mohamad Musavi, Associate Dean for Education and Research, College of Engineering

Dana Humphrey, Dean of Engineering

Scott Delcourt, Associate Vice President for Graduate Studies and Senior Associate Dean

Land Acknowledgment Options

The University of Maine recognizes that it is located on Marsh Island in the homeland of Penobscot people, where issues of water and territorial rights, and encroachment upon sacred sites, are ongoing. Penobscot homeland is connected to the other Wabanaki Tribal Nations— the Passamaquoddy, Maliseet, and Micmac—through kinship, alliances, and diplomacy. The University also recognizes that the Penobscot Nation and the other Wabanaki Tribal Nations are distinct, sovereign, legal and political entities with their own powers of self-governance and self-determination.

UMaine President's Council on DEI

Hi Scott,

Just a quick note as a follow-up to Thursday's meeting.

I was really excited to hear about the proposal for the land acknowledgment in grad student theses and dissertations. I also appreciated Dylan's note in the chat and wondered if it might make sense for the land acknowledgment to be personalized in a positionality statement in the document.

In HED, we expect students to provide a positionality statement to foreground their identities and potential biases - regardless of the methodological approach. This seems like an easy way for students to also acknowledge the land and connect it to themselves more personally than just a required "cut and paste" approach. I think you mentioned there is a sub-group working on this. Please feel free to share or let me know if I can help.

Warm regards,
Elizabeth

Articulating your positionality means locating yourself in your familial history, discerning where your knowledge comes from, and addressing the lived experiences that guide your perspective in your life, research, and teaching roles. We all inhabit intersectional identity groups that connote varying levels of power and privilege such as race, socioeconomic class, ability, religion, gender, and sexual orientation.

(https://intheclass.arts.ubc.ca/renewed-project/discussion-topics-prompts/discussion-prompts-positionality/).