THE UNIVERSITY OF MAINE
Graduate School

Graduate Board
Thursday, May 12, 2022

By Zoom:
Join Zoom Meeting
ID: 81242611103
Passcode: 838395

3:00-4:30 pm

AGENDA

1. Review/approval of the March 2022 and April 2022 Graduate Board minutes
2. Review/approval of the May 3, 2022 Curriculum Committee report
3. Review of 2022-23 Graduate Board membership
4. 2022-23 Graduate Executive Committee
5. 2022 Commencement debrief
6. Graduate School Orientation program (Aug 24-25, 2022)
7. Graduate School retention efforts (Ace)
8. Draft policy on nonterminal master's degrees (redux)
9. Draft changes to letter of recommendation form (redux)
10. Substantive change for SBE master's degree programs
11. Items arising

THE UNIVERSITY OF MAINE Graduate School

Graduate Board
Thursday, March 24, 2022

By Zoom:
Join Zoom Meeting
ID: 88375847888
Passcode: 310967

3:00-4:30 pm

AGENDA

Meeting called to order: 3:05PM

Attendance: E. Allan, P. Agrrawal, J. Artesani, T. Bowden, S. Butler, M. Camire, S. Campbell, A. Cruz-Uribe, S. Delcourt, J. Deisenrieder, S. De Urioste-Stone, D. Dryer, S. Ell, S. Fraver, J. Gill, A. Goupee, W. Gramlich, K. Huguenard, S. Klein, A. Knightly, N. Godfried, M. LaRocque, S. Marrs, J. McClymer, C. Murphy, N. O-Reilly, E. Pandiscio, F. Peterson, J. Romero-Gomez, J. Stoll, N. Stormer, G. Van Walsum, J. Walker, R. Wheeler, T. Yoo, Y. Zhu

Guests: Ace Barrera, Graduate Student Success Manager; Crystal Burgess, Director of Graduate Communications, Jeffrey Hecker, Psychology, Dyan Walsh, Social Work, Katie Glover, Climate Change Institute.

1. Review/approval of the February 17, 2022 Graduate Board minutes
   Inadvertently omitted from attendance list – Nathan Godfried
   Pankaj Agrrawal– motion to approve
   Sharon Klein – 2nd
   Unanimous approval with the attendance edit

2. Review/approval of the March 1, 2022 Curriculum Committee report

New Courses:
EDT 574 Computational Thinking for Early Childhood and Elementary
EDT 575 Integrating Computational Thinking for Middle and High School
EMA 505 Mathematics Methods for Secondary Teachers
PAX 590 Special Topics in Peace and Reconciliation Studies
PAX 699 Masters Project

Modifications:
EDT 580 Summer Technology Institute
EDT 657 Educational Practicum
FSN 542 Sustainability, Nutrition and Health

M. Camire noted that the prerequisite for FSN 542 needed to be corrected to say "graduate standing or instructor permission."

No further discussion
Sharon Klein- Motion to approve
Sandy Butler- 2nd
Unanimous approval

3. Announcements/updates
    a. UMSS – need judges/volunteers (GSG President Janina Deisenrieder)
        i. Link to sign up: https://umaine.edu/umss/
            Judging will be done remotely prior to the April 15 awards presentation

            GSG Appreciation Ceremony Information (April 27, 2022): https://docs.google.com/document/d/1KWBRyKFc3B80i7QF0zBiJ7TDqv4HFWHttAVUJqFbDCc/edit

        Outstanding student submissions due April 15 (Only 5 responses thus far). GSG will recognize the students at GSG recognition event.

    b. Commencement update –
        Friday May 6 – 4:00PM – plan to arrive at 3:00PM – Memorial Gym
        Faculty participation is encouraged.
            If you plan to attend any of the commencement ceremonies, please let us know by completing the University of Maine 2022 Commencement Attendance/Regalia Form by April 7, 2022. https://docs.google.com/forms/d/1tQeBz_vmaNCDug4XsW5CUWdvXKHRoNXcRZYASCiHDog/edit

    c. ERGP (GERS) rollout
        i. Program to return a portion of the tuition generated by entrepreneurial programs. (Graduate Tuition Revenue Sharing)
        ii. Getting close to being able to implement returning revenue to the pilot programs (60% of the tuition revenue growth – through the college dean for distribution).
            1. Social work will be able to decide whether to use the UMaine Gold funds for a fixed length prior to the move to the ERGP.
            2. MBA – may be more complicated in setting up revenue return – but UMaine has the MBA program on the tyuition revenue return list.

d. Scholarship award recipients

Graduate School Scholarships (2022-23)

Atlantic Provinces and Quebec Scholarships:
Melina Typaldos, CSD
Alysha Eaton, CSD (renewed)
Naomi LePage, CSD (renewed)

Trustee Tuition Scholarships:
Ashley Reynolds, FSN
Katherine Matthews, ENG
Tegwin Taylor, EES
Esther Adekeye, BMS
Rori Smith, IMD
Hannah Schmidt, HTY
Guzaloyo Zakhirova, GPL
Noor Tofailli, GPL
Aislinn Canarr, SWK
Amelia Forman-Stiles SWK
Chyanne Lesher, CSD
Lauren Sabintino, CSD

Thurgood Marshall Scholarships:
Winnifred Joseph, GPL
Jasmine Lamb, CSD (declined)
Hui-Tung Karen Lee, CSD
Christophe Mbuyi, AEP
Hammed Ojugubele, GPL

4. Academic Program proposals
   a. MBA concentration in Engineering Management – Dean Norm O'Reilly
      i. Students would do core 8 courses in MBA program & 3 courses in Engineering.
      ii. MBA is very popular with engineers – and many are working full time, so flexibility is very important. Many students attend year round.
          Dean O'Reilly & Dean Humphrey have both approved the new program – and are ready to put it forward for further approval.
      iii. Alicia Cruz-Uribe asked if this was similar to some other schools curriculum. Dean O'Reilly stated that it is very similar – and has a focus on project management.
      iv. Andrew Goupee – asked about requirement for students to enter.
          Dean O'Reilly responded that there are 5 different background courses – but, this is designed for someone with an engineering undergraduate degree. Average work experience is 9 years before applying for an MBA.

Motion to approve – Yifeng Zhu
2nd Andrew Goupee
Unanimously approved

b. Graduate Certificate in Rural Integrated Behavioral Health in Primary Care
Jeff Hecker and Dyan Walsh presenting
Psychology and social work programs have obtained funding from HRSA – Will be offering continuing education for community, faculty, and students.

Do individuals have enhanced opportunities to work in mental health? Specialized mental healthcare – but working as part of a team in primary care.

Motion to approve - Dylan Dryer
2nd - Nathan Stormer
Unanimous approval to move forward to the Provost

c. Graduate Certificate in Climate Science and Adaptation (revised proposal) – Katie Glover
Proposal has been revised – name change to differentiate between this and existing certificate. Clearer goals and expected outcomes.
Substantive changes – there is a lot of language around targeting K-12 educators. There is a need in Maine and nationally. CCI has some national recognition.
Some of the programming will be moving forward this summer. More information is available: https://umaine.edu/summeruniversity/climate-change-workshop/

Motion to approve – Jim Artesani
2nd – Sandy Butler
Unanimous approval

5. Revised draft policy on a land acknowledgment statement for theses and dissertations
   a. Executive Committee recommended that this becomes a strong recommendation to include in theses and dissertations, but not required.
   b. Programs should provide some support in developing the researcher positionality statement if that is an option.
   c. Option 1 (expected) - President's Council on DIE recommended statement – and Option 2 - the addition of the research positionality statement.

Sharon Klein suggested that we require Option 1 – and suggest Option 2
We should update the template – there is a Word doc & a LaTex statement.
Should it be "required" or "expected" to include? If we put it in the template, students would have to make a conscience decision to remove it if they choose.

Dylan Dryer suggested that if we "require" it – there may be some who challenge it.

William Gramlich – we may need to provide education about it and allow for a more informed choice.

Nathan Stormer – where do you stand in terms of research ethics – it does force students to think about this as part of it as well. (Josh Stoll & Sharon Klein agreed with Nathan).

Sharon Klein – wondering how many students know about the agreement between the Penobscot Tribe and the University…. suggested that maybe it be included in RCR courses moving forward.

Scott Delcourt would like to talk to Amanda Ashe about this – and present one more modified draft to the Executive Committee one more time before putting it out for Graduate Board vote.

6. Proposed revision of the Graduate School letter of recommendation form
   Suggestion from one of the Grad Programs to make the recommendation more specific.

   Dylan Dryer suggested adding: "How does the applicant compare to any others that you have recommended?"

   Sharon Klein agreed with Dylan's suggestion – and whether we wanted to add numeric bounds to that. ("How many students have you recommended & where would this student rank relative to that?")

   Crystal Burgess suggested that we add a 1-5 ranking (and illustrated an option within TargetX that would allow this).

   Scott suggested "top 10%", "top 25%" or "below average", etc….
   Dylan Dryer suggested the following:
   "Approximately how many students have you agreed to write letters of reference for in the past 10 years? How does this particular candidate compare to those students?"

   Scott recommended that the Grad Executive Committee take another pass at the form and take a look at it again next month based on the suggestions from this meeting.

7. Items arising – none

Motion to adjourn – Yifeng Zhu

Meeting Adjourned: 4:15PM

THE UNIVERSITY OF MAINE
Graduate School

Graduate Board
Thursday, April 21, 2022

By Zoom:
Join Zoom Meeting
ID: 83869023396
Passcode: 928283

3:00-4:30 pm

AGENDA

Meeting called to order 3:05pm

Attendance: L. Hakkola, P. Agrrawal, J. Artesani, N. O'Reilly, C. Beitl, J. Bonnet, T. Bowden, S. Butler, S. Delcourt, J. Deisenrieder, D. Dryer, S. Fraver, J. Gill, A. Goupee, H. Greig, W. Gramlich, K. Huguenard, M. Camire, A. Knightly, N. Godfried, Z. Ludington, C. Murphy, E. Pandiscio, F. Peterson, P.Poirier, S. Marrs, J. Romero Gomez, D. Rooks-Ellis, G. Van Walsum, J. Settele, J. Walker, T.Yoo, Y. Zhu, N. Stormer

Guests: Ace Barrera, Graduate Student Success Manager; Crystal Burgess, Graduate Communications Director.

1. Congratulations on those Graduate Board members who recently have received a promotion to Associate professor with tenure!
    a. Seth Campbell, Glaciology
    b. Valerie Herbert, Nursing
    c. Zach Ludington, Spanish
    d. Leah Hakkola, Higher Education

2. March Grad Board Minutes will be reviewed at the May meeting.

3. Review/approval of the April 5, 2022 Curriculum Committee report

   New Courses:

   BIO 500 Biological Inquiry and Analysis

   EHD 511 Classroom-based Prevention and Intervention

   ESC 552 Teaching Science in Secondary Schools

   MEE 520 Nanomaterials and Nanomechanics

   Modifications:

   CMJ 515 Mass Communication Theory

   FSN 586 Sensory Evaluation II

   FSN 603 Nutrient Changes in the Food System

   SED 505 Diversity of Development in Childhood

   SEI 524 Supporting Play and Social-Emotional Development of Infants and Young Children

   Motion to accept – Sandy Butler
   2nd – Yifeng Zhu
   Approval with 1 abstention – Mary Ellen Camire

4. Commencement update
   a. Graduate Commencement May 6, 2022 – Classes of 2020, 2021, and 2022 – largest Graduate Commencement ever – 414 students – including 60 PhD candidates participating and 138 faculty.

5. 2022-23 Graduate Board membership – reminder that if your term is up – we will have the roll call next meeting to see who will be staying on, or who will be leaving Grad Board in AY 2022-23.

6. Changing meeting time for Graduate Board?

   Is 3PM on the 3rd Thursday of the month still the best time to meet?

Executive Committee recommends to continue with current time for AY2022-2023 and then move to 12:30-2PM on Thursdays starting in the Fall 2023. This will allow faculty serving on GB to avoid that time in their teaching schedules.
No objections heard from the Grad Board membership.
Zach Ludington spoke in favor of the change – as did Hamish Greig.

We will look toward moving back to live meetings with refreshments in the Fall 2022 semester!

7. Revised draft policy on a land acknowledgment statement for theses and dissertations - see attachment in the April Grad Board Packet

Jim Artesani – motion to approve
Pank Agrrawal – 2nd

Eric Pandiscio asked about the positionality statement and whether it was part of the template. Scott Delcourt confirmed that it is not.
Recommend the DEI land acknowledgment statement. Many students will choose not to include a researcher positionality statement based on the nature of their research.
This change would impact August 2022 grads and beyond.

No further discussion - unanimous approval

8. Draft policy on nonterminal master's degrees – see attachment in the April Grad Board Packet.
    a. The proposal is to confer a nonterminal master's degrees for students who have completed the stated master's degree requirements or who have completed at least 30 credit hours exclusive of thesis credits and have been admitted to doctoral candidacy.
        i. The clinical psychology program currently confers a MA degree to their doctoral students who have been admitted to candidacy and have completed at least 30 credits
        ii. Other option where Master's & PhD programs are closely related –

complete requirements for non-thesis master's degree.

iii. Andy Knightly suggested a proposed revision to 1st sentence: replace "the most or all the" with "most or all of"

iv. Dylan Dryer suggested that "this theoretically could also provide a satisfactory off-ramp for a PhD student who has completed Master's requirements, but has decided along the way not to continue." Scott noted that this off ramp already takes place in many UMaine PhD programs. The student simply switches to the master's degree.

v. William Gramlich – asked for clarification regarding the requirements – either 30 hours of course work – where some programs may not hit the 30 hour requirement.

vi. Christine Beitl suggested that they were already doing this in Anthropology. Would students have to apply in order to receive the degree? Under this policy – students would only need to apply to graduate (not apply through the Graduate School for the MA program). The master's program would be manually added with the approval of the graduate program coordinator and the Graduate School, and would be conferred at the next graduation term. Crystal Burgess added - we receive notification once the student applies to graduate – and that triggers the degree conferral. This policy solidifies the ability to receive a master's degree.

vii. L. Hakkola asked what about doctoral students in education who already have a master's degree? CAS or EdS is identified as 30 credit post-master's degree credential and could be awarded with revisions to the draft policy to include this option as opposed to a earning a master's degree.

viii. Jacquelyn Gill - Is there a way to make it easier from the Grad School's perspective to roll over into a PhD program from a Master's program? Some faculty doesn't realize that students have to reapply once they complete a Master's degree. Scott responded that we should be able to streamline that process.

Andy Knightly asked if a Master's student can double count those credits? For students who did a master's degree at UMaine and then

progressed to a doctoral degree, all the credits are already on the graduate transcript and may be potentially counted toward the doctoral degree. External graduate credits are a different matter and are limited to no more than 50% of total credits applied toward the doctoral degree.

ix. Terry Yoo suggested that this was common in Computer Science to want to receive a Master's degree – even if they were initially accepted for a PhD. However, an issue came up for an international student this year…visa requirements were impacted. When degree is issued impacts the start of OPT, so international students should check with the office of international programs.

9. Items arising
    a. Ace Barrera, Student Success Manager – upcoming initiatives
        i. Navigate – implementation this coming fall for Graduate Students
        More information coming in the upcoming months.
        Stuart Marrs suggested that in LAS they filled out a survey about using Navigate but, didn't hear back.
        Nathan Stormer – the system may have more capacity than what we need.
        Jim Artesani – uses Navigate extensively.
        Scott Delcourt suggested that it may be most helpful for larger graduate programs to assist with retention. (Education, Social Work, Business)
        There are also possibilities to post things like ACR reports via Navigate that may help speed up that process.
        ii. *Ad Hoc* Committee to discuss Mentor / Mentee Relationship – Advisor / Advisee Relationship.
            Ace will be reaching out to determine what guidelines, student handbooks, or documents that grad programs are providing for guidance to their grad students?
        iii. Student Surveys – what surveys do programs currently in place?
        Our focus will be on retention and student success. We would like

to collaborate with departments who may be doing something similar to avoid redundant requests for information and to ease the burden on graduate program coordinators.

10. GSG has newly elected officers whose names will be released later this week. Spring Appreciation Event this coming week (April 27).

    May 12 – final Graduate Board Meeting of the AY 2021-22 academic year. Please bring any new members who have been elected to Grad Board for next year.

    Meeting Adjourned 4:17PM

CURRICULUM COMMITTEE REPORT

The Curriculum Committee met on May 3rd, 2022 and is recommending the following courses to the Graduate Board for approval at its May 12th meeting.

New Courses:

KPE 641 General Medical Conditions & Pharmacology

MET 540 Lean Six Sigma

Modifications:

SIE 505 Formal Foundations for Information Science

Special Memo:

Please see memo with several ECO prerequisite changes that were approved at the recent Curriculum Committee meeting.

GRADUATE BOARD MAY 12, 2022				
NAME	TERM	DEPT.	GB MEMBER SIGNATURE	PROXY
Allan, Elizabeth	2024	EDL		
Agrrawal, Pankaj	2021	BUA*		
Artesani, Jim	2022	EDU*		
Beaupre, James	2021	Innov. & Eco. Dev.		
Beitl, Christine	2023	ANT		
Bolton, Jason	2021	Coop. Ext.		
Bonnet, Jennifer	2021	Library		
Bowden, Timothy	2021	AAR		
Butler, Sandy	2022	SWK		
Camire, Mary Ellen	2025	FSN		
Campbell, Seth	2021	CCI		
Cruz-Uribe, Alicia	2022	ERS / ECS		
Delcourt, Scott	-	GS* - *ex officio*		
Deisenreider, Janina		GSG- President		
De Urioste-Stone, Sandra		OVPRDGS* - *ex officio*		
Dryer, Dylan		ENG*		
Ell, Shawn	2022	PSY		
Fraver, Shawn	2023	SFR		
Gill, Jacquelyn	2021	SBE		
Goupee, Andy	2024	MEE		

Greig, Hamish		EES		
Gramlich, William	2022	CHY		
Harding-Heber, Kathleen	-	GS - *ex officio*		
Herbert, Valerie	2024	NUR		
Huguenard, Kimberly	2024	CIE		
Klein, Sharon	2023	SOE*		
Knightly, Andy	2022	MAT		
Knowles, Anne	2023	HTY		Nathan Godfried
Karapurkar, Ameya	2020	GSG - Board of Trustees		
LaRocque, Monique	2024	DLL		Patricia Libby
Ludington, Zach	2024	MLC		
Marrs, Stuart		MUP		
McClymer, James	2021	PHY		
Murphy, Christina	2024	WLE	(replacement for Carly Sponarski)	
Ohno, Stom	2021	PSE		
Onsrud, Harlan	2021	SCIS		
O'Reilly, Norm	-	BUA		
Pandiscio, Eric	2024	EDU / HUD		
Peterson, Franziska	2021	MST		Susan McKay
Poirier, Pat		NUR		
Romero Gomez, Juan	2024	ANS		
Rooks-Ellis, Deborah	2021	COEHD		

Smith, Susan L.	2021	IMD		
Stoll, Josh	2022	SMS		
Stormer, Nathan		COM		
Van Walsum, Gerard (Peter)	2024	CHB/BME		
Varahramyan, Kody	-	DEAN*		
Vekasi, Kristin	2022	SPIA		Jim Settele
Walker, Judy		CSD		
Wheeler, Rob		BMMB		
Yoo, Terry	2021	COS		
Zhang, Zhen	2022	GSBSE		
Yifeng Zhu	2024	ECE*		

*Executive Committee Member

SPEAKERS/GUESTS

NAME	TITLE	SIGNATURE

Proposed Policy on Nonterminal Master's, Ed.S. or CAS Degree

Many University of Maine doctoral students complete most or all of the requirements for the program's cognate master's degree in the course of their doctoral study. To recognize this achievement, a nonterminal master's degree may be awarded if the student satisfies the following criteria:

1. Student remains in good standing in the doctoral program.
2. Student has completed at least 30 hours of graduate-level credit (exclusive of thesis credits) and has been admitted to doctoral candidacy or has met all the degree requirements for the cognate master's degree.
3. Student has no outstanding conditions on their admission and no outstanding financial balance owed to the University of Maine.

Some graduate programs may place additional requirements on the student such as admission to doctoral candidacy, while certain programs may decline to award a nonterminal master's degree.

In University of Maine doctoral programs where students already possess a master's degree and either the Ed.S. or CAS is an available degree (i.e. education and nursing, respectively), students may earn the Ed.S. or CAS upon meeting the same requirements described above.

Process: Upon satisfaction of the criteria for awarding a nonterminal master's degree, the graduate program coordinator sends an approved program of study to the Graduate School. The Graduate School will create a master's degree record in addition to the student's doctoral record and award the master's degree in the next scheduled graduation term.

- crystal.burgess@maine.edu

Phone Number

- Relationship to Student

- On a scale of 1-5 (5 being the highest), please indicate the student's academic ability and potential to succeed in graduate level coursework
  Please select an option
- On a scale of 1-5 (5 being the highest), please indicate the student's motivation for the proposed program of study
  Please select an option
- This recommendation may be used for:
  Please select an option

Please include the reasons for your recommendation of this student, or attach a document below. Examples of recommendation topics include: What is your estimate of the applicant's promise as a graduate student and professional success? What are the applicant's greatest strengths and weaknesses? What is the extent of your acquaintance with the applicant?

If you are attaching a letter of recommendation, please write "See attached letter" below.

Proposed Recommendation Form

Add a question requesting the reference to rank the applicant compared to other students at their institution with options to indicate top 1%, top 5%, top 5%, etc.

Language of question and rank options are to be determined by Graduate Board.

Employer
University of Maine

Email Address
• crystal.burgess@maine.edu

Phone Number
2075813223

• Relationship to Student
Professor/Instructor

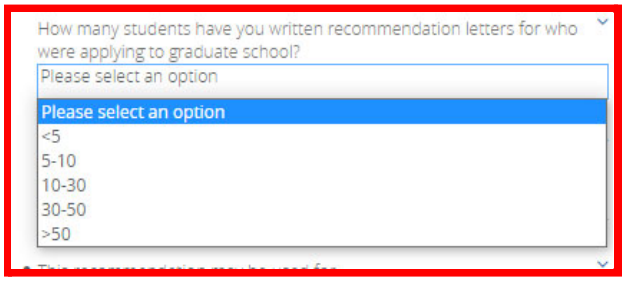
• On a scale of 1-5 (5 being the highest), please indicate the student's academic ability and potential to succeed in graduate level coursework
Please select an option

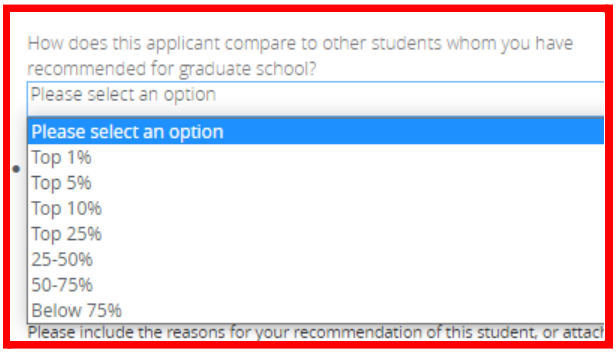
• On a scale of 1-5 (5 being the highest), please indicate the student's motivation for the proposed program of study
Please select an option

How many students have you written recommendation letters for who were applying to graduate school?
Please select an option

How does this applicant compare to other students whom you have recommended for graduate school?
Please select an option

• This recommendation may be used for:
Please select an option





UNIVERSITY OF MAINE SYSTEM
SUBSTANTIVE CHANGE TO AN EXISTING DEGREE PROGRAM

_____ XGraduate
_____ Two-Year
_____ Four-Year

University of Maine

1. **Title:** Biological Sciences, Entomology
Degree: MSc, PhD
Area:
CIP Code:

2. Person Responsible for Planning

Name: Jacquelyn Gill
Address: 134 Sawyer

Department: School of Biology and Ecology
Telephone Number: 1-2305

3. General Objective of Proposal

This Substantive Change Form presents our proposed revisions to the MS in Entomology and the new consolidated MS and PhD in Biological Sciences (with optional concentrations). This work modernizes our degrees and brings them into alignment with peer institutions and workforce expectations. This proposal consists of three major changes: 1) We consolidated our MS degrees in Zoology and Botany and Plant Pathology into a MS in Biological Sciences, a degree option we were previously lacking. Not having a MS in Biological Science was causing issues with graduate recruitment, particularly with new faculty hires who wanted to bring in students whose work was more biomedical or integrative and did not align with our existing MS options. 2) We consolidated our PhD in Zoology, the Interdepartmental PhD in Plant Sciences (managed by SBE), and the PhD in Biological Sciences. This provides a more flexible, cohesive, and integrative pathway for our doctoral students, eliminates an out-dated doctoral degree (e.g., Zoology) and brings us in alignment with workforce needs and peer institutions.

The program revisions in this proposal consist of the following changes, eliminations, or additions:

- We created a new required course (BIO 500) for incoming students, based on feedback from graduate students that they wanted more cohort building and better foundational training in the biological sciences across the disciplines. This course will be required for all incoming students, for all degrees, and will provide a strong foundation for students coming in from diverse disciplines (i.e., forest entomology, biomedical research, aquatic science, paleoecology).

- We developed new concentration requirements. Rather than rely on poorly differentiated legacy degrees (e.g., Botany and Plant Pathology, Zoology), which aligned poorly with the needs of our graduate student body, we now have specific concentrations that reflect SBE faculty research and which are more in alignment with workforce expectations and peer programs (e.g., integrative biology and EEB departments). These concentrations have been aligned with the SBE curriculum, which

reflects new expertise and course offerings resulting from multiple new faculty hires. Our existing degrees (e.g., Botany and Plant Pathology, Zoology) were poorly differentiated and did not have clear course roadmaps, and so this change will make our program more transparent and tailored to student needs.

- We dropped an outdated foreign language requirement from our consolidated PhD degrees. This is no longer a workforce expectation, and this change creates more space for students to learn quantitative skills (which are in demand).

- The MS in Entomology has been retained, but has been updated to reflect evolving workforce needs (most of our graduates go on to work in industry or state and federal agencies). We updated the course requirements following the hiring of three new entomology faculty and the addition of several courses that were not previously offered.

We are retaining the following in these consolidated degrees:

- The 30-credit minimum, the proposal defense, and the comprehensive exams for PhD students.

- The required course BIO 505: Professionalism in Biology, which also fulfils the RCR requirement.

- The requirement for 2 credits of seminar-designated courses (literature-heavy, with a presentation component).

- The quantitative methods requirement (e.g., statistics, programming, GIS, modeling).

- The requirement for thesis/research credits (6-credit minimum, as per Graduate School guidelines).

- The requirement for the oral defense for MS and PhD students, and an oral exam for non-thesis MS students.

This proposal does not require any change in facilities or personnel, aside from the new course (which can be covered by existing faculty: no new hires are proposed).

4. Documented Evidence of Need

In 2019, SBE was notified by NSFA that several of our graduate degrees had been flagged by the Programs for Examination process due to low enrollment. This was due to our department's history (which itself consolidated from Botany, Zoology, Entomology, and other units), while our degree options remained the same as the legacy departments. In addition, gaps in faculty hiring and the formation of EES have reduced enrollemnt in several of our degrees. SBE faculty had already identified a need for a MS in Biological Sciences to serve growth in our department, and as part of this process, it was determined that consolidation, rather than the addition of yet another degree, would best serve our students. In addition, SBE graduate students had provided consistent feedback in surveys and town halls that our degree offerings did not align with workforce needs, and that some requirements (e.g., foreign language) were not in alignment with their needs.

After consulting with members of the SBE faculty and the cooperating departments served by the Plant Sciences program, we decided to modernize and consolidate our MS and PhD degrees into a unified MS and PhD in Biological Sciences with concentrations. We revised the program requirements for these consolidated degrees, which had not been updated since before the School's formation. SBE faculty unanimously supported keeping the MS in Entomology separate, to support three recent faculty hires and serve workforce needs.

Our proposed changes thus represent a streamlining of our degree offerings to be more in line with what students are looking for when they apply to graduate school, as well as updates that reflect workforce expectations. They also bring us in alignment with peer institutions, and bring our MS and PhD program structures in alignment.

5. A. Which campuses, agencies, organizations, institutions or individuals have you involved in the program?

Name	Address	Individual Contact	Title
School of Biology & Ecology Faculty		Farahad Dastoor	Director
College of National Sciences, Forestry, & Agriculture		Diane Rowland	Dean

B. Which campuses, agencies, organizations, institutions or individuals do you plan to involve in the program?

Name	Address	Individual Contact	Title
University of Maine			

C. How?

The proposed changes will not result in any changes to the administration or availability of these degrees; these changes represent a consolidation of existing degrees and some minor changes to the requirements to bring them into contemporary best practices and peer institutions.

6. What type and/or extent of support is presently available?

A. Personnel

These revisions require no adjustments to our current personnel. Graduate Coordinator (Jacquelyn Gill), office administrator (Trish Costello), office administrator (Peg Killian), SBE Director (Farahad Dastoor), SBE graduate faculty, financial administrators (Sarah Smith and Judy Tomasik).

B. Facilities

Assorted offices, laboratory space, and classrooms in Murray Hall, Deering, Hitchner, Sawyer, Norman Smith, Clapp, and elsewhere. Facilities will not be impacted by this program revision.

B. Equipment

Equipment will not be impacted by this program revision.

C. Funding Sources

Funding will not be impacted by this program revision.

E. Library Resources

Library resources will not be impacted by this program revision.

F. Other

G. What additional new costs are required in any or all of the above categories?

N/A

7. **Briefly describe preliminary plans for regular program evaluations, formative and summative.**

We are participating in a pilot program with OIRA to develop our new program assessment planning and reporting. Additionally, this program will be evaluated annually in the SBE Faculty Retreat, where we devote at least half a day each year to our graduate programs. We also receive feedback from our students regularly, which is used to make adjustments. We are beginning exit interviews with graduate students beginning in Spring 2022, and we receive regular feedback on our graduate programs from SBE Grad Organization surveys and town halls (done on an annual and semester basis, respectively).

8. **Time Frame:** 2020-indefinite
Estimated Planning Time: Completed (2020-2022)
Estimated Implementation Time: Fall 2022
Estimate of Program Lifetime: Indefinite

9. **COMPLETE FOR GRADUATE PROGRAM ONLY: On what other campus, if any, will this program be available? What plans are there to ensure transferability from other campuses into this program or to deliver this program to other campuses?**

N/A

10. **Other Pertinent Data and/or Information**

Please see the attached document for proposed program requirements for the MS in Entomology and the MS and PhD in Biological Sciences.

11. Submitted By:

Jacquelyn Gill (March 23, 2022)

Approved By:

(College Dean)
(Date) (March 24, 2022)

(Associate Provost for Lifelong Learning)
(Date)

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

(Provost)
(Date)

(President)
(Date)

Requirements for the MS or PhD in Biological Sciences

Qualified candidates for the graduate program in the Biological Sciences should have a Bachelor's degree in biology, botany, chemistry, ecology, environmental science, natural resources, wildlife biology, zoology, or a similar field. Students with other undergraduate degrees may be required to take additional coursework, either before or during their matriculation. Interested students should read faculty web pages and contact prospective advisors to discuss their interests, qualifications, and the admissions process.

1. **Graduate Advisory Committee and Program of Study:** Each student will be advised by a graduate advisory committee consisting of at least three graduate faculty members for Master's students or five graduate faculty members for Ph.D. students. The advisory committee should be formed during the first year of graduate study. A Program of Study (POS), approved by the student's graduate advisory committee, is required for both Master's and PhD students. For Master's students, the POS is due before completion of twelve credits or by the third registration, whichever comes first. For PhD students, the POS must be submitted to the Graduate School before the end of the first year of study for students holding a Master's degree. Those holding only a baccalaureate degree must file the POS before completion of 12 credits or by the third registration, whichever comes first.

2. **Written Research Proposal and Proposal Defense:** A written research proposal must be approved by the student's advisory committee no later than 12 months from the time of matriculation of an M.S. student or 18 months from the time of matriculation of a Ph.D. student. A public proposal seminar, outlining the research planned or presenting preliminary results, is required.

3. **Annual Progress Report:** A report on the progress of each student is required each year, which will be reviewed by the Graduate Committee. Reports will be due by the second Friday in April each year.

4. **Credits:**

   MS: A minimum of **30 credits**, including thesis credits, are required for the Masters, taken at the graduate level (400 or higher). Students may take 100-300 level courses, but these will not count towards requirements. Students are required to complete at least 12 credits of 500- and/or 600-level course work. A minimum of 6 thesis credits are required, with a maximum of 15 total.

   PhD: A minimum of **30 credits**, including thesis credits, are required for the doctorate, taken at the graduate level (400 or higher). Up to 30 course credits may be transferred from a Master's program, and may make no more than half of the doctoral credits. Doctoral students are

required to complete at least 12 credits of 500- and/or 600-level course work. A minimum of 6 thesis credits are required, with a maximum of 15 total.

Course Requirements

5. **Seminar requirement**: At least two seminar credits total are required. Any seminar course will qualify as long as it includes a presentation by the student. (Note: EES 598: Ecology and Evolution of Everything may only count as 1 credit towards this requirement, but can be taken multiple times towards the overall credit requirements, and may also count towards an area requirement. BIO 500 does not count towards this requirement).

6. **Quantitative Methods Requirement:** At least **3 credits** are required to demonstrate proficiency in quantitative methods. Options include:

    - AVS 554 - DNA Sequencing Analysis Lab (2 cr)
    - BIO 557/558/559 - R programming language
    - BIO 593 - Advanced Biometry (4 cr)
    - BMB 502 - Introduction to Bioinformatics (3 cr)
    - MAT 586 - Biological Modeling and Simulation (3 cr)
    - PSE 509 - Experimental Design (4 cr)
    - SIE 510 - Geographic Information Systems Applications (3 cr)
    - SIE 512 - Spatial Analysis (3 cr)
    - SFR 406 - Remote Sensing of the Forest Environment (3 cr)
    - SFR 575 - Advanced Forest Biometrics and Modeling (3 cr)
    - STS 437 - Statistical Methods in Research (3 cr)

7. **Biological Inquiry and Analysis:** All students are required to take BIO 500 - Biological Inquiry and Analysis (2 cr), typically in their first semester. Students who took this course at the Masters level who continue on for a PhD are not required to take BIO 500 a second time.

8. **Professionalism:** All students are required to take BIO 505 - Professionalism in Biology (2 cr), or a suitable substitution as approved by the graduate coordinator. Substitute classes must fulfill the Responsible Conduct of Research requirement, as defined by the Graduate School. Continuing doctoral students are not required to re-take this course.

9. **Thesis or Dissertation Submission and Defense**: Master's students must submit a thesis describing the results of an original research investigation. Doctoral students must submit a dissertation describing the results of an original research investigation, following advancement to candidacy (after completion of the comprehensive examination and proposal). The acceptability of the Master's thesis or Doctoral dissertation shall be determined in a final oral defense conducted under the supervision of the student's graduate advisory committee.

Preceding the defense, each candidate must present a public seminar describing the results of the research (this is typically scheduled immediately before the defense). A copy of the student's thesis or dissertation must be made available upon submission of the Tentative Thesis to the Graduate School (at least five business days before the defense). This is typically provided as a printed copy, but may also be shared electronically with the defense announcement.

Additional Requirements for Doctoral Students

10. **9. Teaching:** All students must have one semester of teaching experience, which may be waived with committee approval and appropriate coursework (e.g., EES 590 - Teaching in Ecology and Environmental Sciences or the CITL Teaching Academy (or equivalent).

11. **Comprehensive Examinations:** Before a student is admitted to candidacy as defined by the Graduate School, they must pass comprehensive written and oral examinations. These examinations can be scheduled no earlier than the end of the third semester of graduate study, must be initiated by the fifth semester, and completed no later than the eighth semester.

    The written examination will be given before the oral examination, and will consist of five parts, each representing a distinct subject field. Exam fields will be determined and administered by the advisory committee; each committee member (or an appropriate substitute) typically provides or approves of a reading list of primary literature and/or books. Exam fields are meant to represent broad topics in the biological sciences or application degree concentration (e.g., Community Ecology, Developmental Biology, Bioinformatics). Preparation for these exams typically take at least a semester.

    The written exam is typically administered over the course of five days, with one exam field being tested each day. The parameters of each exam are up to the advisory committee member (i.e., length of exam, number of questions, open/closed book). The student is required to pass all five parts of the comprehensive written examination in order to proceed to the oral examination. If the student fails a component of the written exam, they may be re-examined once. The examining committee may require additional coursework before any or all portions of the written are retaken.

    The comprehensive oral examination will be administered by the same committee that gave the comprehensive written examination, and may consist of follow-up questions related to the oral exam, further questions about assigned readings or exam field topics, or any other questions the examining committee deems relevant. The examination is considered to have been passed if at least four members of the examining committee consider the performance passing; no more than one dissenting vote can be cast. Students may pass without conditions,

may pass conditionally (upon completion of coursework, additional reading, or other work), may retake the oral examination once at a future date, or may fail without taking the exam at a future time. A failed examination prevents admission to candidacy, and the student may no longer continue in the program (students will have the option to transition to a Masters in this case).

Concentrations

The MS or PhD in Biological Sciences may be taken with or without concentrations. At least **9 credits** must be taken from a given concentration area to qualify (substitutions may be made with approval). BIO 512: Advanced Seminar in Biology (1-3 credits) or BIO 597: Special Topics in Biology (1-6 cr) or similar temporary offerings may satisfy area requirements as appropriate.

Biological Sciences - No Concentration

For a degree without concentration, you must choose **at least 9 credits** of courses distributed across **three or more** areas. Note: courses listed for multiple areas may only count for one of those areas.

I. Ecology, Evolution, and Biodiversity

AVS 577 - Zoonoses and Animal Health (3 cr)
BIO 430 - Ecology and Systematics of Aquatic Insects (4 cr)
BIO 431 - Emerging Infectious Diseases (4 cr)
BIO 463 - River Ecology (4 cr)
BIO 5XX - Insect Taxonomy (3 cr)
BIO 468 - Lake Ecology (3 cr)
BIO 501 - Evolutionary Theory & Applications (3 cr)
BIO 515 - Thermal Ecology- Animals and Climate Change (3 cr)
BIO 510 - Climate, Culture, and the Biosphere (3 cr)
BIO 511 - Insect Ecology (3 cr)
BIO 525 - Community Ecology (3 cr)
BIO 532 - Biology of the Fungi (4 cr)
BIO 524 - Behavioral Ecology (3 cr)
BIO 555 - Biological Invasions
BIO 572 - Paleoecology (4 cr)
BIO 579 - Animal Behavior
BIO 529 - Plant-insect Interactions (3 cr)
EES 598 - Ecology and Evolution of Everything (1 cr)
SFR 507 - Forest Ecology (3 cr)
WLE 591 - Movements and Migrations (3 cr)
BIO 5XX - Forest Entomology (3 cr)

BIO 5XX- Principles of Pest Management (3 cr)
BIO 5XX - Macroevolution and Phylogenetics

II. Physiology, Cell, and Developmental Biology

BIO 504 - Advanced Developmental Biology (3 cr)
BIO 515 - Thermal Ecology- Animals and Climate Change (3 cr)
BIO 574 - Neurophysiology (3 cr)
BIO 579 - Behavioral Endocrinology (3 cr)
BIO 580 - Cell BIO (3 cr)
BIO 583 - Cell Biology Lab (1 cr)
EES 5XX - Genomes to Phenomes Seminar
BMS 635 - Mammalian Genetics
BMS 645 - Biology Tissue Development and Function
BMS 660 - Cell, Molecular, and Developmental Neurobiology
WLE 591 - Movements and Migrations (3 cr)

III. Biomedical Sciences

BIO 504 - Advanced Developmental Biology (3 cr)
BIO 580 - Cell Biology (3 cr)
BIO 583 - Cell Biology Lab (1 cr)
BMS 625 - Genetics, Biostatistics/computational biology, Physiology, Biochemistry
BMB 502 - Introduction to Bioinformatics
BMS 525 - Molecular Genetics
BMS 630 - Journal Club in Biomedical Science and Engineering
BMS 635 - Fluorescence Technology in Biomedical Science
BMS 635 - Mammalian Genetics
BMS 635 - Mouse Genome Manipulation Module
BMS 635 - Advanced Mouse Genome Manipulation Module
BMS 690 - The Biology of Aging
BMS 645 - Biology Tissue Development and Function
KPE 580 - Human Biomechanics (3 cr)

IV. Plant Sciences

BIO 428 - Issues in Plant Genetic Engineering (3 cr)
BIO 452 - Plant Physiology (3 cr)
BIO 453 - Plant Physiology Lab (1 cr)
BIO 464 - Taxonomy of Vascular Plants (4 cr)
BIO 532 - Biology of Fungi (4 cr)
BIO 555 - Biological Invasions (3 cr)
BIO 529 - Plant-insect Interactions (3 cr)
BIO 5XX - Forest Entomology (3 cr)
PSE 410 - Plant Propagation (4 cr)

PSE 415 - Greenhouse Management (4 cr)
PSE 430 - Environmental Horticulture (3 cr)
PSE 440 - Environmental Soil Chemistry and Plant Nutrition (3 cr)
PSE 469 - Soil Microbiology (3 cr)
PSE 513 - Weed Ecology and Management (3 cr)
PSE 557 - Plant Pathology (4 cr)
SFR 406 - Remote Sensing of the Forest Environment (3 cr)
SFR 439 - Biology of Woody Plants (3 cr)
SFR 507 - Forest Ecology (3 cr)
SFR 520 - Development and Growth of Plants (3 cr)
SFR 522 - Physiological Ecology of Plants (3 cr)
SFR 557 - Tree Pests and Diseases (3 cr)
SMS 528 - Advanced Phycology
WLE 423 - Wetland Ecology and Conservation (3 cr)

Requirements for the MS in Entomology

The MS in Entomology program is designed for students interested in the study of insect ecology, diversity, and management. Qualified candidates for a graduate program in entomology should have a Bachelor's degree in entomology, biology, botany, chemistry, ecology, environmental science, natural resources, zoology, or a similar field. Students with other undergraduate degrees may be required to take additional coursework. Interested students should read faculty web pages and contact prospective advisors to discuss their interests, qualifications, and the admissions process.

1. **Graduate Advisory Committee and Program of Study:** Each student will be advised by a graduate advisory committee consisting of at least three graduate faculty members for Master's students or five graduate faculty members for Ph.D. students. The advisory committee should be formed during the first year of graduate study. A Program of Study (POS), approved by the student's graduate advisory committee, is required for both Master's and PhD students. For Master's students, the POS is due before completion of twelve credits or by the third registration, whichever comes first. For PhD students, the POS must be submitted to the Graduate School before the end of the first year of study for students holding a Master's degree. Those holding only a baccalaureate degree must file the POS before completion of 12 credits or by the third registration, whichever comes first.

2. **Written Research Proposal and Proposal Defense:** A written research proposal must be approved by the student's advisory committee no later than 12 months from the time of matriculation of an M.S. student or 18 months from the time of matriculation of a Ph.D. student. A public proposal seminar, outlining the research planned or presenting preliminary results, is required.

3. **Annual Progress Report:** A report on the progress of each student is required each year, which will be reviewed by the Graduate Committee.

4. **Credit Requirements:**

   MS: A minimum of **30 credits**, including thesis credits, are required for the Masters, taken at the graduate level (400 or higher). Students may take 100-300 level courses, but these will not count towards requirements. Students are required to complete at least 12 credits of 500- and/or 600-level course work. A minimum of 6 thesis credits are required, with a maximum of 15 total.

Course Requirements

5. The following courses are required:

   a. BIO 5XX Insect Taxonomy (5 cr)
   b. At least one of the following:
      - BIO 430/530 Ecology and Systematics of Aquatic Insects (4 cr)
      - BIO 511 Insect Ecology (3 cr)
   c. At least one of the following:
      - BIO 431 Emerging Infectious Diseases (4 cr)
      - BIO XXX Forest Entomology (3 cr)
      - BIO 429/529 Plant-Insect Interactions (3 cr)
      - BIO XXX Principles of Pest Management (3 cr)
      - BIO 455/555 Biological Invasions (3 cr)
   d. A course in quantitative methods (3-4 cr)
   e. BIO 500 Biological Inquiry and Analysis (2 cr)
   f. BIO 505 Professionalism in Biology (2 cr)
   g. A seminar course with a presentation (2 cr minimum)
   h. BIO 699 Thesis credits (6 cr minimum)

All students will need to take additional credits of additional coursework or research credits, as recommended by their advisory committee. Students who did not take an undergraduate general entomology course may be required to take either BIO 326 General Entomology or BIO 597 Advanced Entomology.

Students will be required to pass an oral general knowledge exam in entomology as a part of their oral thesis defense examination in order to complete their degree program. Proficiency can be acquired through course work and/or suggested readings provided by faculty.

Non-thesis Option for the Master's Degree

The M.S. degree in Biological Sciences has a literature-based, non-thesis option met by taking coursework and completing a review of the primary literature under the supervision of a graduate committee. Requirements are the same as the MS in Biological Sciences (with optional concentrations) and follow the same guidelines, with several exceptions:

- Students do not take thesis credits.
- Students are not required to take a quantitative methods course.
- Non-thesis students must also accrue six hours of credit in laboratory or field research by completing courses (e.g., BIO 687: Problems in Biology) that require an independent research project, or by completing a semester-long internship.
- Non-thesis M.S. students will be required to pass an oral examination at the end of their degree. Questions for the exam will focus on the literature-based capstone project, as well as a synthesis of ecological or biological concepts relating to the student's program of study. This will be administered by the student's graduate advisory committee, at the end of the degree. Students will have two attempts to pass their oral examination.