THE UNIVERSITY OF MAINE
Graduate School

Graduate Board
Room 57, Stodder Hall
Thursday, September 26, 2019
3:00 pm – refreshments
3:15 pm - meeting

AGENDA

Meeting called to order:
In Attendance:

1. Review/approval of the May 9, 2019 Graduate Board minutes

2. Review/approval of the September 3, 2019 Curriculum Committee report

   New Courses:
   EDT 572 - Teaching Programming in Multiple Paradigms
   ECO 550 - International Environmental Economics and Policy
   MEE 590 - Modern Control Theory and Applications
   FSN 542 - Sustainability, Nutrition and Health

   Course Modifications:
   ECO 581 - Agent-Based Modeling
   EDT 616 - New Directions for Educational Technology

3. Announcements/updates:
   a. Orientation Recap
   b. Ice Cream Social Recap (formerly the picnic)
   c. Mug Club – First Thursday of every month; 4-6pm (See handout).
   d. Workshop on Best Practices in Mentoring (October 3, 12-1pm)
   e. **Graduate School Open House** – Thursday, October 3, 2019; 3:30pm-6:00pm
   f. Conversations with college deans, directors and chairs groups

4. AY 19-20 plan for developing graduate student learning outcomes

5. Enrollment management update

6. Recap of the March 8 graduate summit and discussion of AY 2019-20 graduate priorities

7. Discussion of timeline for admission decisions

8. Items arising

2019-2020 Curriculum Committee, Executive Committee and Grad Board Meetings

Curriculum Committee	Executive Committee	Grad Board
2:00-4:00	3:00-5:00	3:00-5:00
Stodder Hall Room 48	Stodder Hall Room 48	Stodder Hall Room 48
September 3	September 12	September 26
October 1	October 10	October 17
November 5	November 14	November 21
December 3	December 12	December 19
January 7	January 16	January 30
February 4	February 13	February 27
March 3	March 12	March 26
March 31	April 9	April 23
April 28	April 30	May 7

THE UNIVERSITY OF MAINE
Graduate School

Graduate Board
Room 57, Stodder Hall
Thursday, May 9, 2019
3:00 pm – refreshments
3:15 pm - meeting

MINUTES

Meeting called to order: 3:20pm – 31 in attendance including guests: Debra Allen & Amanda Barrington from the Institutional Research Office.

P. Agrawal, J.Ballinger, K.Beard, J. Bomar, J. Bonnet, T. Bowden, D. Bradley, S. Butler, S. Delcourt, S. Ell, K.Evans, C. Grindrod, C. Isenhour, S.Jain, Z. Jin, M.Kiensler, M. LaRocque, E. Pandiscio, P.Poirier, L. Rickard, D. Rooks-Ellis, D. Shulman, O. Smith, C. Sponarski, M. Tajvidi, K. Vekasi, C. Villacorta Gonzales, V.Weaver.

1. Review/approval of the April 25, 2019 Graduate Board minutes
   3 corrections to the minutes were noted by Shaleen Jain.
   Pg 2 – CIE
   Pg. 3 – Pank Agrrawal
   Pg 6 – Mohamad Musavi
   Owen moved to accept the minutes & Deborah Rooks-Ellis seconded.
   Unanimous approval with corrections noted above

2. Review/approval of the April 30, 2019 Curriculum Committee report
   New Courses:
   FSN 545 – Utilization of Aquatic Food Resources
   EAD 660- The Adult Learner in PK-12 Education
   EAD 661- Advanced Educational Supervision
   EHD 544 – Mentoring, Supervision, and Teacher Development

   Course Modifications:
   FSN 502 – Food Preservation
   FSN 538- Food Science and Nutrition
   ERS 544 – Introduction to Glaciology
   SED 564- Universal Design for Learning Pre-K-12 Classrooms
   SED 585 – Communication for Students with Autism Spectrum Disorder

E. Pandiscio motioned to approve Curriculum Committee Report and S. Butler seconded.

A brief discussion about graduate course approval and the course approval form took place; how will credit hours in online and nontraditional classes be calculated? Engagement hours outside the class? Condensed classes?
S. Delcourt and M. LaRocque both noted that the course approval form requires an update to better take some of these issues into account.
Unanimous approval for Curriculum Committee Report

Announcements/updates:

- Graduate Commencement – May 10 - Deans will march with the Graduate Students. Executive Committee members will be in the front row & will be announced with college deans as they approach the statge.

- NAS visit (May 21-22); See: https://umaine.edu/risingtide/conversations-for-change/ A day and a half seminars on current topics in graduate STEM education including increasing diversity & sexual harassment, Owen Smith will moderate a session on the first day on including the humanities in the STEM curriculum.
  Link is on the Rising Tide site to register if anyone is interested.

- Fall 2019 orientation planning –
  Trying to come up with the best way to deliver information. We are putting a lot of information on the Graduate School web site via an online orientation page. As a result, new graduate student orientation will be a half day in the afternoon. The orientation program for new teaching assistants will be partially hosted by the Graduate School and partialy by the RISE Center and CITL.

  Question about orientation – consider changing the time to earlier in the week?

  S. Delcourt talked about putting the orientation online – the afternoon session will mostly feature hands on activities –tours and an opportunity to interact with Grad Student Government & Grad School staff.

  Programs can expect a call for TA, GA, RA information by the end of May – names needed by June 15th if possible.

3. Review of Graduate Board membership and their intent to continue.
   S. Delcourt went through the list and polled attending members:

   Pankaj Aggrawal – 2021
   Jim Artesani – 2022 (Deborah Rooks Ellis responding for Jim)

Kate Beard – 2021
Jonathan Bomar will be replaced by incoming GSG President – Lacey Darling
Doug Bousfield - absent
Tim Bowden - 2021
David Bradley 2022
Sandy Butler 2022
Dylan Dryer 2022
Shawn Ell- 2022
Keith Evans - 2022
Jim Fastook - absent
Jacques Ferland - stepping off committee & will be replaced in the fall
Julie Gosse – absent (Melody and Julie are from the same program)
Hamish Greig – absent
Chris Grindrod – will get back to us – possibly 2022
Christine Beitl – Anthropology – proxy for first semester for Cindy Isenhour
Shaleen Jain - 2021
Zhihe Jin - 2020
Michael Kienzler- 2021
Dorothy Klimas-Zacas - absent
Karl Kreutz - absent
Stuart Mars – on sabbatical – replacement to be named.
Ian Mette - absent
Melody Neely- absent
Stom Ohno - absent
Eric Pandiscio - 2021
Pat Poirier – 2022
Andrew Reeve – absent
Laura Rickard – 2022
Deborah Rooks-Ellis- 2021
Deborah Shulman – 2021
Owen Smith – 2021
Carly Sponarski - 2022
Kristen Vekasi - 2022
Carlos Villacorta Gonzales - 2021
Vince Weaver - absent

Mike Kinnison – stepping off the Executive Committee
Cindy Isenhour – stepping off the Executive Committee
Cindy was presented with a token of appreciation from the Graduate School.
Michael was recognized *in absentia.*

4. Election of 2019-20 Executive Committee

Carly Sponarski (Wildlife Ecology) – has agreed to stand for election representing NSFA

Dylan Dryer (English) – has agreed to stand for election representing CLAS
With no other nominations from the floor, both were approved by acclamation of the Board.

5. Assessment of graduate programs – Dr. Debra Allen and Amanda Barrington, Office of Institutional Research and Assessment

Background – during the NECHE accreditation visit – suggested a systematic effort needed to assess graduate programs. OIR representatives mentioned that the University has not made as much progress with graduate assessment as undergraduate program assessment. 2009 NEASC review – assessment was an issue. By 2012 we had made some progress at the undergraduate level.

What do we mean by assessment? Student Learning Outcomes….data to inform student learning and student development. (It is not program review – but, program assessment.) Identifying student learning outcomes. Collect data & use it to improve programs.

2014 UMaine current plan was approved by the Provost for use in undergrad. We have made great progress at the undergrad level. There are unique challenges at the graduate level – professional vs. research programs – and degree vs. certificate programs.

D. Allen has started to look at other institutions for best practices. One of our goals is to take inventory of what is currently happening for assessment in graduate programs and to develop supporting materials.
Assessment starts with identification and measurement of learning outcomes.

M. Barrington asked how many graduate programs have assessments going on now. (Approximately 5 hands went up) – Accredited programs have to have assessments each year.

If we want to do assessments – the criteria will have to be similar – but, unique to the program. We may have the elements already happening in most programs. The OIR would like to work with the Graduate School on this & help organize the assessment protocols.

Should we be looking at the same tools we use in undergrad?
How should we be collecting the information?
Step 1 = what are the learning outcomes of your program? What do you want your students to learn & be able to do? (4 outcomes are appropriate).

Cindy Isenhour volunteered that she does an informal assessment with her students – to ask what they hope to get out of the program – and then an exit survey at the end to see what they got out of the program. (Indirect assessment.)

At the undergrad level – who coordinates the assessment? Usually the program coordinator or director. At the graduate level the graduate program coordinator would be involved

S. Delcourt suggested the look at other universities assessments, it may help guide what ours should look like. Deb Allen will share the slides for the presentation – and Scott will send to Grad Board.

Deb will reach out to the individual programs to work with them on assessment planning.

6. Addition of a 4+2 track to the existing 4+1 track in the School of Economics
   Proposal from Tim Waring – for the School of Economics
   Delcourt informed the Board that since the 4+1 track proposal was already approved this amendment is presented to the Graduate Board for informational purposes.

7. Review of proposed 4+1 track Computer Science
   With Jim Fastook absent, S. Delcourt summarized the proposal which closely follows the 4+1 guidelines established by the Graduate Board. Undergraduate students would apply for the accelerated program track leading to a non-thesis MS degree in their junior year and could take up to nine graduate credits which would count towards the MS degree.

   E. Pandiscio – do any of the tuition incentives apply to a 4+2 program?
   S. Delcourt – no due to the fact that graduate students are often supported on assistantships if they do a thesis – the 4+1 option is in place for students who are self-paying to reduce their overall cost to earn a master's degree. Beyond 1 extra year, it's not really considered to be an accelerated master's degree program.

   Delcourt also noted that 4+1 options are being developed with other schools within the system – at UMF, UMM, for example. It is also a possibility to develop 4+1 options outside the UMS with schools like Colby. SPIA already has a 4+1 arrangement with Dickinson College.

   Deborah Rooks-Ellis stated that the 4+1 arrangement with UMM is an online program so that the student could stay in their hometowns and take courses.

   E. Pandiscio- If a student doesn't finish on time – what are the consequences? Do they have to retake the 9 credits?
   S. Delcourt – stated that there is an appeals process – especially if the circumstances were beyond the student's control. However, the arrangement to double count the credits is predicated on students finishing more quickly and with their own financial support.

   4+1 in Computer Science was unanimously approved through a vote of the Board.

8. Review/approval of proposed graduate specialization in Conservation Science
   S. Butler – Grant to focus on Conservation Science.
   Program of study had to have representation from 2 different departments.
   Specialization – would be 13 specific course credits.
   Forest Resources Program would currently qualify.
   You could take this curriculum and specialize from any program with 13 extra courses. We had 24 applicants – and given funding we were able to accept 9 students.
   K. Evans noticed that EES 598 is repeated twice.
   S. Delcourt suggested that we will present a final version to the curriculum committee. Assistantships are provided from the faculty within the program.

   All are in favor of endorsing the Specialization in Conservation Science.

9. New affiliation agreements involving the MBA program
   S. Delcourt informed the Graduate Board that these are included on the agenda for informational purposes to be recorded in the Graduate Board minutes. Neither agreement requires approval because both follow established Graduate School procedures regarding admission and accepting transfer credit.
   University of New England – School of Pharmacy partnership for Dual MBA – PharmD – UMaine agrees to accept 6 credits toward the MBA, and UNE agrees to accept 6 credits towards PharmD degree.

   Other agreement with the American University in Bulgaria – essentially a pathway for promoting the UMaine MBA to undergraduate business administration students in Bulgaria.

   Jamie Ballinger stated that Dean Weber & UNE are very excited about creating the partnership for the PharmD – MBA, observing that we have one student already accepted for fall.

10. Review of proposal for a MS in Data Science and Engineering - redux
    The Graduate School received a second memo from Dean Mohamad Musavi requesting to meet with the planners of the proposal for the MS in Data Science & Engineering. Additional discussion was also held at the Faculty Senate yesterday. Vice President Varahramyan had sent word that he was willing to move forward to review by the Provost Council of an intent to plan. If the intent to plan is approved up through the VCAA, the final proposal would need to address the issue of how data engineering is included in the program's curriculum.

    Penny Rheingan, SCIS, added that the school's intention is to collaborate with all the interested colleges moving forward.

    If we entertain a motion to approve the "intent to plan"

O. Smith – there was some discussion in our April Graduate Board meeting regarding ownership of names for the programs – i.e. if it says "Design" – does it belong to Art? Software engineering is an academic area within SCIS.

S. Jain mentioned that some time ago UMaine had declared Data Science & Engineering an area of excellence. This area of excellence involves more faculty than those exclusively in SCIS, for example Yifeng Zhu and Bruce Segee. SCIS and ECE could be extremely productive in the long run in this program. We should go over the proposal and see what would be good for UMaine as a whole. Talk to various stakeholders involved. The intent and the proposal came in nearly at the same time. All of the departments involved may not have been consulted in advance due to the rush to get the program approved.

Penny Rheingans stated she can't speak to how people involved may have been overlooked early in the process. It is our intention to reach out to Engineering but the proposal could really involve faculty in all 5 colleges.

S. Delcourt proposed a resolution stating that the Graduate Board recommends moving forward the Intent to Plan to the office of the Provost for the next level of review with the requirement that discussions among stakeholder departments take place prior to the submission of the final program proposal.

All those in favor of endorsing the resolution….unanimous.

11. Items arising

Owen Smith – IMRC offering a one week digital boot camp – photo editing, video editing, publication and design. Marketing towards graduate students. All day for one week – the last week of the summer term.

Jon Bomar is leaving the board as GSG President. Lacey Darling is going to take over as GSG President next year.

Meeting adjourned at 4:45pm

CURRICULUM COMMITTEE REPORT

The Curriculum Committee met on September 3rd and recommends the following courses to the Graduate Board for approval at its September 26th meeting.

New Courses:

EDT 572 Teaching Programming in Multiple Paradigms

ECO 550 International Environmental Economics and Policy

MEE 590 Modern Control Theory and Applications

FSN 542 Sustainability, Nutrition and Health

Modifications:

ECO 581 Agent-Based Modeling

EDT 616 New Directions for Educational Technology

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

Graduate course proposals, modifications, or eliminations must be submitted to the Graduate School no later than the 3rd of each month. Please refer to the Graduate School website for the Curriculum Committee meetings schedule. Electronic signatures and submission is required.

Please return the completed e-form with appropriate signatures and documentation to the Graduate School by saving the form to your desktop and sending as an attachment to graduate@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

GRADUATE PROGRAM/UNIT COEHD Instructional Technology

COURSE DESIGNATOR EDT COURSE NUMBER 572 EFFECTIVE SEMESTER Spring 2020

COURSE TITLE Teaching Programming in Multiple Paradigms

REQUESTED ACTION

NEW COURSE (check all that apply, complete Section 1, and submit a complete syllabus):

- ☐ New Course
- ☒ New Course with Electronic Learning
- ☐ Experimental

MODIFICATION (Check all that apply and complete Section 2):

- ☐ Designator Change
- ☐ Number Change
- ☐ Title Change
- ☐ Description Change
- ☐ Prerequisite Change
- ☐ Credit Change
- ☐ Cross Listing (must be at least 400-level)[1]
- ☐ Other (specify)

ELIMINATION:

- ☐ Course Elimination

ENDORSEMENTS

Please sign using electronic signatures. If you do not already have a digital signature, please click within the correct box below and follow the on-screen instructions.

Leader, Initiating Department/Unit(s)

Meredith Swallow Digitally signed by Meredith Swallow Date: 2019.02.21 20:53:09 -05'00'

College(s) Curriculum Committee Chair(s) (if applicable)

March 8, 2019

College Dean(s)

Graduate School (sign and date)

1. Courses cross-listed below 400-level require the permission of the Graduate School.

SECTION 1 (FOR NEW COURSE PROPOSALS)

Proposed Catalog Description (include designator, number, title, prerequisites, credit hours)

The audience for computer science education is larger and more diverse than ever, but educators are often tasked with teaching the subject without any formal exposure to the fundamentals of programming, particularly as it relates to their students. Embracing the wide variety of needs and abilities of different age groups, this course is an introduction to different coding paradigms and some of the programming languages that are appropriate for all levels of K12 and beyond. These paradigms include but are not limited to block-based, imperative, and object-oriented, and students will use different development environments to explore different application domains. There will be an emphasis on computational problem solving and the key aspects of algorithm development. Students will create unit progressions that allow their learners to work collaboratively and inclusively Prerequisite: EDT 571 or permission of instructor. Credits 3

Components (type of course/used by Student Records for MaineStreet) – *Multiple selections are possible for courses with multiple non-graded components:*

☐ Applied Music ☐ Clinical ☐ Field Experience/Internship ☐ Research ☐ Studio

☐ Laboratory ☒ Lecture/Seminar ☐ Recitation ☐ Independent Study ☐ Thesis

Text(s) planned for use:

Course instructor (include name, position, teaching load)

Chris Bennett - University of Maine Farmington Computer Science Faculty

Reason for new course:

This course builds on knowledge and skill development from EDT 571 to include specific coding and programming skills relevant to participants' contexts.

Does the course addition require additional department or institutional facilities, support and/or resources, e.g. new lab facilities, computer support and services, staffing (including graduate teaching assistants), or library subscriptions and resources?

◉ No. The department will not request additional resources for this course.

◯ Yes. Please list additional resources required and note how they will be funded or supported.

What other departments/programs are affected (e.g. course overlap, prerequisites)? Have affected departments/programs been consulted? Any concerns expressed? Please explain.

How often will this course be offered? Will offering this course result in overload salary payments, either through the college or CSD, either to the instructor of this course or to anyone else as a result of rearranging teaching assignments?

Every year

EDT 598 (572)
Teaching Programming in Multiple Paradigms
Fall 2019

Instructor: Chris Bennett
Email: chris.bennett@maine.edu

Course Description The audience for computer science education is larger and more diverse than ever, but educators are often tasked with teaching the subject without any formal exposure to the fundamentals of programming, particularly as it relates to their students. Embracing the wide variety of needs and abilities of different age groups, this course is an introduction to different coding paradigms and some of the programming languages that are appropriate for all levels of K12 and beyond. These paradigms include but are not limited to block-based, imperative, and object-oriented, and students will use different development environments to explore different application domains. There will be an emphasis on computational problem solving and the key aspects of algorithm development. Students will create unit progressions that allow their learners to work collaboratively and inclusively.

Prerequisites EDT 571 or permission of instructor

Course Objectives

Students will be able to:

- Identify computational problems appropriate for different learning audiences
- Demonstrate understanding of the key components of algorithm development
- Solve computational problems using different programming languages
- Demonstrate an understanding of the appropriateness of different development tools for different learning audiences
- Demonstrate an understanding of different application domains in computer science

Course Outline

This represents a tentative schedule of topics in approximately two-week modules. Some topics within each module are subject to change, but this will represent the basic outline of topics we will cover.

Module	*Topics*
Computational Problem Solving	Abstraction: Input, Process, Output

	The Computer as a Tool Building Blocks of Coding
Development Environments	Operating Systems Coding Paradigms Development Environments- Editing, compiling, and running programs Selecting appropriate languages and environments for different audiences Documentation and versioning systems
Translating Solutions to Code	Overview of building blocks including: • Data storage • Data manipulation • Conditional execution • Conditional repetition • Abstraction
Block-based Coding	Scratch Blockly and Blockly-based Development Environments Designing audience-appropriate assignments in block-based environments
Imperative Coding	Python Designing audience-appropriate assignments in Python Other imperative languages
Object-oriented Coding	Processing Designing audience-appropriate assignments in Processing Other Object-oriented languages
Application Domains	Numeric Computation Sorting and Searching Image Processing Simulation Game Development Data Mining Artificial Intelligence

Required Materials

Readings Students are not required to purchase any texts – all materials will be available online. Potential course readings and materials include but are not limited to:

Pedagogy in teaching Computer Science in schools: A Literature Review

N. Fraser, "Ten things we've learned from Blockly," 2015 IEEE Blocks and Beyond Workshop (Blocks and Beyond), Atlanta, GA, 2015, pp. 49-50.

Cecilia R. Aragon , Sarah S. Poon , Andrés Monroy-Hernández , Diana Aragon, A tale of two online communities: fostering collaboration and creativity in scientists and children,

Proceedings of the seventh ACM conference on Creativity and cognition, October 26-30, 2009, Berkeley, California, USA

Twenty Seven Things I Wish I'd Known When I Started Programming, Forbes Magazine, February 3rd, 2017.

Why Python is a great language for teaching beginners in introductory programming classes

Blockly - A JavaScript library for building visual programming editors

Scratch - A cloud-based blockly development environment

AppInventor - Block-based development environment for mobile applications

Python - The Python programming language including a text editor and runtime interpreter.

Processing - A Java-based, visual arts-focused programming environment

How to Think Like a Computer Scientist, online interactive textbook for learning Python.

The Nature of Code, an online text using the Processing environment that simulates and explores natural phenomena.

Software/Hardware Students will need a Windows, Mac, or Linux-based computer on which they have the ability to install software. Most computers should be powerful enough, but please talk with the instructor if you have questions. Students will need the :

Slack (https://slack.com/) – Communication and collaboration tool that has desktop, web, and mobile clients. This software is not absolutely required, but it is an effective tool for group communication across many platforms. You will receive an invitation to join Slack at the beginning of the semester.

Git / Github (https://desktop.github.com) – Versioning and control system for storing and tracking files, including your code.

Text Editor (https://www.sublimetext.com/) – You will need to install a text editor for this course – I will use Sublime, but you may choose another if you wish. You should not use the default text editors in Windows (notepad) or MacOS (textedit) – these do not have the functionality that we need.

Python (https://www.python.org/downloads/) – You will install the Python development environment to create programs using the Python programming language.

Processing (https://processing.org/download) – A Java-based development environment that is more focused on working in the visual arts.

Expectations of Students

Students are expected to engage regularly with the course materials and meaningfully contribute to the course dialog involving other students and the instructor. Everyone is expected to complete assignments in a timely manner, with a recognition that some flexibility is needed given busy schedules.

Expectations of Instructor

The instructor will post course materials and provide constructive feedback to assignments and questions in a timely and consistent manner. The instructor will communicate those times when students can expect limited communication due to travel or other circumstances.

Grading

Active Participation	9%	
Assignments for Each Module (x7) For each module, there will be between two and four assignments. Each module will count equally in the aggregate, and each assignment within a module will count equally within that module.	13%	(x7 = 91%)

Potential Activities and Assignments

- Install and explore multiple development environments for languages from different paradigms including block-based, imperative, and object-oriented.
- Create accounts for hosting projects and source code.
- Create both pen-and-paper and coded solutions to common numerical tasks such as logarithms, square roots, and other "calculator button" problems.
- Create a real-world application using an appropriate language from an application domain such as image processing, data mining, data visualization or game development.
- Create a program that simulates the actual functioning of a computer (a "virtual machine") to better understand the role of the processor, memory, and other aspects of a modern computer.

- Write a survey of different modules, plug-ins and libraries for a particular programming environment that would be appropriate for a particular audience of learners such as early K5, middle school, high school, or adult learners.
- Participate in discussions about user interface design and user experience in different applications.
- Compare and contrast the appropriateness of different languages and environments for different audiences of new learners.

Academic Honesty Statement: Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers or projects, to submit papers or projects written by another person, to fake experimental results, or to copy or reword parts of books, articles, or other work into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.

Students Accessibility Services Statement: If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with the instructor of the course privately as soon as possible. FMI https://umaine.edu/studentaccessibility/

Course Schedule Disclaimer (Disruption Clause): In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Observance of Religious Holidays/Events: The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

Sexual Discrimination Reporting

The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of **sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination** involving members of the campus, **your teacher is required to report** this information to the campus Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity.

- **If you want to talk in confidence** to someone about an experience of sexual discrimination, please contact these resources:
- For *confidential resources on campus*: **Counseling Center: 207-581-1392** or **Cutler Health Center: at 207-581-4000**.
- For *confidential resources off campus*: **Rape Response Services:** 1-800-310-0000 or **Partners for Peace**: 1-800-863-9909.
- **Other resources:** The resources listed below can offer support but may have to report the incident to others who can help:
- For *support services on campus*: **Office of Sexual Assault & Violence Prevention: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911**. Or see the OSAVP website for a complete list of services at http://www.umaine.edu/osavp/

The most recently updated version of the following five sections can be found at:

https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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Please return the completed e-form with appropriate signatures and documentation to the Graduate School by saving the form to your desktop and sending as an attachment to erin.twitchell@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

GRADUATE PROGRAM/UNIT: School of Economics

COURSE DESIGNATOR: ECO COURSE NUMBER: 550 EFFECTIVE SEMESTER: Spring 2020

COURSE TITLE: International Environmental Economics and Policy

REQUESTED ACTION

NEW COURSE (check all that apply, complete Section 1, and submit a complete syllabus):

- [x] New Course
- [ ] New Course with Electronic Learning
- [ ] Experimental

MODIFICATION (Check all that apply and complete Section 2):

- [ ] Designator Change
- [ ] Number Change
- [ ] Title Change
- [ ] Description Change
- [ ] Prerequisite Change
- [ ] Credit Change
- [ ] Cross Listing (must be at least 400-level)[1]
- [ ] Other (specify) _____

ELIMINATION:

- [ ] Course Elimination

ENDORSEMENTS

Please sign using electronic signatures. If you do not already have a digital signature, please click within the correct box below and follow the on-screen instructions.

Leader, Initiating Department/Unit(s)

12/20/2018

College(s) Curriculum Committee Chair(s) (if applicable)

12 MAR 19

College Dean(s)

Graduate School (sign and date)

1. Courses cross-listed below 400-level require the permission of the Graduate School.

SECTION 1 (FOR NEW COURSE PROPOSALS)

Proposed Catalog Description (include designator, number, title, prerequisites, credit hours):

Designator: ECO
Number: 550
Title: International Environmental Economics and Policy
Prerequisites: MAT 115, and C- or better in either ECO 350 or ECO 420, or equivalent with permission.
Credit Hours: 3
Does it meet Service Learning?: N
Description:

International environmental economics and policy uses an economic framework to examine the reasons behind, and methods to solve, conflicts between economic development and growth, trade, and the environment. It then explores the processes of international policy development: identifying problems, designing and negotiating solutions, and implementing policies to change national behavior.

Components (type of course/used by Student Records for MaineStreet) – *Multiple selections are possible for courses with multiple non-graded components:*

☐ Applied Music ☐ Clinical ☐ Field Experience/Internship ☐ Research ☐ Studio
☐ Laboratory ☐ Lecture/Seminar ☐ Recitation ☐ Independent Study ☐ Thesis

Text(s) planned for use:

The instructor does not use a textbook; all of the reading and video content for the course are publically avaialable materials (e.g., WTO, UN-Environmental program, World Bank, etc.)

Course Instructor (include name, position, teaching load):

Marlo Teisl, Professor and Director School of Economics, 1.5 courses per year

Reason for new course:

This course is being offered at the graduate level as both ECO 550 and SPI 550 because the last several times I have taught the course, graduate students made up about ½ of the course enrollment. Students come from various academic programs outside of economics (e.g., SFR, BUA, EES, SPI, SECS, ANT, SMS, SBE). This course is cross-listed as both ECO 550 and SPI 550 with ECO 450. The SPI designation is being included as it is a required course for the Global Policy - environmental concentration.

Does the course addition require additional department or institutional facilities, support and/or resources, e.g. new lab facilities, computer support and services, staffing (including graduate teaching assistants), or library subscriptions and resources?

◉ No. The department will not request additional resources for this course.

○ Yes. Please list additional resources required and note how they will be funded or supported.

What other departments/programs are affected (e.g. course overlap, prerequisites)? Have affected departments/programs been consulted? Any concerns expressed? Please explain.

SPIA. They have been consulted and welcome the new designator and cross-listing. A proposal is being submitted through CLAS as well.

How often will this course be offered? Will offering this course result in overload salary payments, either through the college or CED, either to the instructor of this course or to anyone else as a result of rearranging teaching assignments?

Every other year

ECO 450/550 SPI 550 – International environmental economics and policy – Fall 2020

Time: MWF 10:00-10:50 **Location:** 113 Deering Hall
Instructor: Mario Teisl, Professor and Director School of Economics
Office: 206 Winslow Hall **email:** Teisl@maine.edu
Office Hours: I have many meetings so it is best to schedule an appointment with my Administrative Assistant, Karen Casey (1-3154; Karen.casey@maine.edu)

Description: The class will begin by presenting the basics of environmental economics and policy. We then discuss the economics behind international trade, and its effects on economic growth and development, and their impacts of the environment. We will then examine alternative causes of international environmental problems and explore solutions through the application of international environmental economics and policy. The class finishes by exploring the processes and institutions of international policy development: identifying problems, designing and negotiating solutions, and implementing policies to change national behavior.
3 Credit Hours.
Prerequisites: MAT 115 and C- or better in ECO 350 or 420 or permission

Course objectives: Students, using economic theory, graphs and math, will be able to:

- understand the basics of environmental economics and management
- identify the benefits (economic growth) and costs (environmental quality) of international trade
- explain the economic basis of international environmental problems and the objectives of international environmental policy
- illustrate the constraints faced in developing and applying environmental policy in an international context
- analyze and evaluate the tradeoffs inherent in designing environmental policy

More generally, students should increase their proficiency in critical analysis of economic and environmental problems, and developing logical economic and policy arguments. Students will demonstrate the above on exams, writing assignments and in oral responses in class.

Learning activities: The course uses lecture and discussion to demonstrate the economic interpretation of environmental problems. Exams and homework will be used to test student understanding of key economic concepts and arguments, and their ability to use graphical and mathematical tools. Writing assignments will allow students to demonstrate their ability to use and communicate the economic theories and tools to analyze environmental problems and design appropriate policy responses.

Text(s): Given the nature of the course, no one book satisfies as a textbook. In fact, I pull readings from many different sources. I will provide you electronic copies of readings on Blackboard (most of these are free from sources like the WTO, World Bank etc.). Note there is likely to be some repetition of concepts in the readings but that occurs when you pull together free materials.

BlackBoard: We will use the ECO 450 BlackBoard Website for course announcements, distribution of readings, and course assignments. Your default Blackboard email address is your UMaine gmail address (e.g., XXX@maine.edu); please check this email address daily during the semester. Additional BlackBoard resources can be found at UMaine's Information Technologies web page (http://umaine.edu/it/). If you run into problems contact http://umaine.edu/it/contact-us/.

Homework assignments:
All students: Homework assignments will focus on using your economic, graphical and mathematical skills to analyze policy problems. Unless you have made prior arrangements with me, homework is due by the beginning of class on the assigned due date. Homework may be worked on in groups; if you work as a group you need to only turn in one set of answers (include the names of the people in the group!). The date when homework is to be turned in will be given when assigned; late homework will not be accepted.
Those enrolled in ECO/SPI 550: Homework for graduate students will be longer, require more quantitative sophistication, and require more thoughtful essay responses than above.

Class Participation: Many of our classes will consist of discussions of issues raised in the readings. It is important that all assigned readings be done before the classes for which they are assigned. Class participation is important and you are expected to be able to comment intelligently on the assigned readings.

If you are not in class then you are not participating; however, I do understand the occasional need to miss class due to illness etc. Illness or family emergencies are usually the only acceptable reasons for missing class. If such a problem arises, you need to e-mail me before class and provide a written justification (e.g., medical note) so we can discuss alternatives.

Here is the (increasing marginal) cost schedule for missing class

If you miss 1-2 classes you lose 0 points off your final grade
If you miss 3 classes you lose 2 points off your final grade
If you miss 4 classes you lose 5 points off your final grade
If you miss 5 classes you lose 9 points off your final grade
If you miss 6 classes you lose 15 points off your final grade
If you miss more than 6 classes you lose 25 points off your final grade

Special mandatory attendance days! week of Dec. 12/5 (graduate presenters need an audience!)

Writing/Oral Assignments:
Those enrolled in ECO 450: You do not have a writing or oral assignment
Those enrolled in ECO/SPI 550: You will be required to do one writing/research assignment. You are to work on the research paper as individuals, not as a class; however, I do encourage you to edit each other's papers. You will then present your research paper to the class using a lighting format (Plan on each presentation being 10 minutes and 5 minutes for questions and 1 minutes for switching to next speaker). You must send me your PowerPoint presentation by 10am the day **BEFORE** you are presenting; if you develop your slides on an Apple device then you should also send me a PDF of your slides as a back-up.

Exams.
All students: There will be two midterms and one final exam. Both mid-term exams will consist of two parts: in-class (short questions, math and economic problems) and take-home (longer essay questions). In the essay questions you should demonstrate your understanding of how international environmental problems are evaluated, developed and implemented. Essays must be typed. The take home potion of the exam will be due one-week after the time it is made available. You are to work on the exam as individuals, not as a class. Exam dates are:

Exam 1: Oct. 7
Exam 2: Nov. 4
Final: TBD

Those enrolled in ECO/SPI 550: Exams for graduate students will be longer, require more quantitative sophistication, and require more thoughtful responses than above.

Grading: Assignments not handed in by the due date will receive a grade of 0 unless you have made prior arrangements with me. Illness or family emergencies are usually the only acceptable reasons for missing an exam or a problem set deadline. If such a problem arises, you need to e-mail me before the deadline and provide a written justification for missing the exam (e.g., medical note) so we can discuss alternatives.

Except for very *extraordinary* circumstances, failing to follow these rules will lead to a grade of zero for the missed exam/homework. Any exam from which one student is excused will be replaced by a make-up exam and I will schedule a make-up at only one time for each exam. Except for very exceptional reasons, no exams will be delayed or postponed.

Numerical grades will be used for all exams and homework. Letter grades will be assigned only for the overall course grade given at the end of the semester. Your final grade will be determined as:

	Students in ECO 450	Students in ECO/SPI 550		When due/occurring
Class participation	5%	5%		
Homework Assignments	20%	15%		
Policy Brief		20%		
Reading List & Outline			1%	9/16
First Draft			7%	10/14
Second Draft (optional)			0%	11/11
Final Draft			12%	11/25
Presentations		5%		Week of 12/5
Exam I	25%	20%		Oct. 7
Exam II	25%	20%		Nov. 4
Exam III	25%	20%		TBD

Grading Rubric	%	GPA points
A	93+	4
A-	90-92	3.7
B+	87-89	3.3
B	83-86	3
B-	80-82	2.7
C+	87-79	2.3
C	73-76	2
C-	70-72	1.7
D+	67-69	1.3
D	63-66	1
D-	60-62	0.7
F	Below 60	0

Academic Honesty Statement: Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.

Students Accessibility Services Statement (This should be customized to include the instructor's name): If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me (the instructor of the course) privately as soon as possible.

Course Schedule Disclaimer (Disruption Clause): In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Observance of Religious Holidays/Events: The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

Sexual Discrimination Reporting: The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of **sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination** involving members of the campus, **your teacher is required to report** this information to the campus Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:
For *confidential resources on campus*: **Counseling Center: 207-581-1392** or **Cutler Health Center: at 207-581-4000**.
For *confidential resources off campus*: **Rape Response Services:** 1-800-871-7741 or **Partners for Peace**: 1-800-863-9909.
Other resources: The resources listed below can offer support but may have to report the incident to others who can help:
For *support services on campus*: **Office of Sexual Assault & Violence Prevention: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911**.
Or see the OSAVP website for a complete list of services at http://www.umaine.edu/osavp/

General Calendar

- Preliminaries: Materials balance, externalities, social welfare, market and government failure, Coase theorem/property rights, time dimensions, optimal pollution, environmental policies
- Growth and the environment, environmental Kuznets curve, basic resource economics, international resource management
- Trade theory, comparative advantage, Heckscher-Ohlin model, factor mobility and trade, benefits/costs of trade, trade history and law, policy tools
- Trade liberalization and the environment, pollution haven hypothesis
- Finance-related: FDI and international environmental protection, environmental micro-lending, debt-for-nature swaps
- Global Environmental Politics: History, actors in the environmental arena, the rise of non-state actors, international political economy, game theory of international negotiations
- Conflicts: more vs lesser developed, global vs local, democracy vs dictatorship

Special Dates: No class on 9/5, 10/10, 11/23-25

Fall 2016 Draft Calendar:

week 1: Lecture - Basics
Readings –Pearson Chap 2.pdf; Pearson Chap 3.pdf (skip middle of 49 to part 3); Public goods and common property.pdf
OPTIONAL: Preliminaries.pdf (a review of micro; assume you know it)

week 2: Lecture – Externality theory; benefit-cost analysis
Readings – Pearson Chap 5.pdf (page 114 to middle of 119);
Field & Field Chap 5.pdf; Field & Field BC analysis.pdf;
Damages and Abatement (Figure 4 is a simpler MARGINAL translation of the information in quadrant 1, Figure 5.1, page 116 in Pearson Chap 5 - we will use this translation in class)
OPTIONAL: Economic instruments – notes.pdf

week 3/4: Lecture – Environmental toolkit - liability rules; Coase, Standards; Taxes/Subsidies; Permit markets
Readings – Field & Field Chap 9-13.pdf;
Economic Instruments1.pdf

week 5: Lecture – Multiple damage curves; Policy design with uncertainty in damages, costs; International policy design; Environmental Kuznets curve
Readings – Baumol&Oates – Chap 5.pdf
Russell-choice of instruments.pdf
Economic Instruments2.pdf
EKC.pdf

week 6: Lecture – Ricardo trade model; numerical example
Readings – trade readings1.pdf

week 7: OCT BREAK
Lecture –H-O trade model (fixed proportions); Rybcynski theorem;
Readings – trade readings1.pdf
EXAM 1

week 8: Lecture – Stolper-Samualson theorem; factor price equalization; H-O model (variable proportions);
Readings – Binder 1.pdf

week 9: Lecture – International trade and the environment policy;
Readings – WTO study.pdf (Note that you can skip Section I, Section II E, Section V and VI); Tuna_dolphin & shrimp_turtles.doc; Trade and the Environment.pdf; WTO - dispute settlement.pdf; WTO & environment.pdf; WTO _ Trade and environment.pdf;

week 10: Lecture – International trade and the environment policy – empirical results;
Readings – Environment and trade handbook.pdf (you can skip sections 1, 4, 6 and 7); Evolution of Policy Responses to Stratospheric Ozone Depletion.pdf; Dupont.pdf
OPTIONAL: Trade_Measure.pdf

week 11: Lecture – Politics of International environment policy (business and NGO influence; env negotiations)

Readings –Ponte.pdf; Political economy.pdf; NGO diplomacy chap 6.pdf; deacon&Mueller.pdf; economics-of-japanese-whaling.pdf
EXAM 2

week 12: Lecture – Politics of International environment policy (local versus global diplomacy; top-down or bottom up; central vs democratic movements; green macroeconomics)
Readings –Local vs global.pdf; Dictatorship_democracy.pdf; Green GDP.pdf

week 13: Lecture – Case study: climate change
Readings – Climate change science and policy.pdf
Climate change economics.pdf
Climate change law.pdf

week 14: Oral Presentations

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

Graduate course proposals, modifications, or eliminations must be submitted to the Graduate School no later than the 3rd of each month. Please refer to the Graduate School website for the Curriculum Committee meetings schedule. Electronic signatures and submission is required.

Please return the completed e-form with appropriate signatures and documentation to the Graduate School by saving the form to your desktop and sending as an attachment to graduate@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

GRADUATE PROGRAM/UNIT Mechanical Engineering

COURSE DESIGNATOR MEE COURSE NUMBER 590 EFFECTIVE SEMESTER Spring 2020

COURSE TITLE Modern Control Theory and Applications

REQUESTED ACTION

NEW COURSE (check all that apply, complete Section 1, and submit a complete syllabus):

- [x] New Course
- [ ] New Course with Electronic Learning
- [ ] Experimental

MODIFICATION (Check all that apply and complete Section 2):

- [ ] Designator Change
- [ ] Number Change
- [ ] Title Change
- [ ] Description Change
- [ ] Prerequisite Change
- [ ] Credit Change
- [x] Cross Listing (must be at least 400-level)[1] MEE 4590
- [ ] Other (specify)

ELIMINATION:

- [ ] Course Elimination

ENDORSEMENTS

Please sign using electronic signatures. If you do not already have a digital signature, please click within the correct box below and follow the on-screen instructions.

Leader, Initiating Department/Unit(s)

Masoud Rais-Rohani Digitally signed by Masoud Rais-Rohani Date: 2019.05.09 21:01:42 -04'00'

College(s) Curriculum Committee Chair(s) [if applicable]

Mohamad Musavi 5-10-19 5-10-19

College Dean(s)

Graduate School [sign and date]

1. Courses cross-listed below 400-level require the permission of the Graduate School.

SECTION 1 (FOR NEW COURSE PROPOSALS)

Proposed Catalog Description (include designator, number, title, prerequisites, credit hours):

MEE 590 Modern Control Theory and Applications: (Prerequisite: A grade of C or better in MEE 370, graduate standing in MEE or permission of instructor; Cr 3) This course introduces the state-space methods for analysis and design of linear control systems. The assumed prerequisites are undergraduate courses in linear algebra and dynamic systems and controls. The analysis part of this course is concerned with stability, controllability, observability, realization, and minimality of the state-space model, while the control design part delves into the methods of pole placement for state feedback and observer design, and optimal methods such as linear quadratic regulator (LQR) and Kalman filter. Students will also learn how to apply the theory to engineering problems using MATLAB for both continuous-time and discrete-time systems.A grade of C or better in MEE 370, graduate standing in MEE or permission of instructor. Credits 3

Components (type of course/used by Student Records for MaineStreet) – *Multiple selections are possible for courses with multiple non-graded components:*

☐ Applied Music	☐ Clinical	☐ Field Experience/Internship	☐ Research	☐ Studio
☐ Laboratory	■ Lecture/Seminar	☐ Recitation	☐ Independent Study	☐ Thesis

Text(s) planned for use:

None required. The instructor provides the course texts and extensive handouts.

Course Instructor (include name, position, teaching load):

Babak Hejrati, Assistant Professor, Mechanical Engineering, 50%

Reason for new course:

The topics covered in this course are essential for working in the current areas of modeling dynamic systems and control engineering, and they are prerequisites for taking any advanced courses in these areas such as nonlinear control, optimal control, system identification, etc. In particular, this course will introduce the students to the state-space methods, which are widely used for analysis and design of simple to complex single-input single-output (SISO) and multi-input multi-output (MIMO) dynamic systems. Given the growing number of our graduate students, offering this new cross-listed course can be beneficial for those graduate students whose research involves any aspects of modeling, estimation, and control design for a dynamic system. Also, the state-space techniques developed in this course are applicable to various types of engineering and even non-engineering systems such as aerospace, mechanical, electrical, electromechanical, fluid, thermal, biological, and economic systems.

Does the course addition require additional department or institutional facilities, support and/or resources, e.g. new lab facilities, computer support and services, staffing (including graduate teaching assistants), or library subscriptions and resources?

◉ No. The department will not request additional resources for this course.

○ Yes. Please list additional resources required and note how they will be funded or supported.

What other departments/programs are affected (e.g. course overlap, prerequisites)? Have affected departments/programs been consulted? Any concerns expressed? Please explain.

The topics covered in this course do not overlap with materials covered in any other courses taught in the mechanical engineering department. There are no overlap with other graduate-level courses taught in the college of engineering, or the math department.

How often will this course be offered? Will offering this course result in overload salary payments, either through the college or CED, either to the instructor of this course or to anyone else as a result of rearranging teaching assignments?

Once per year. There will be no overload.

MEE 490/590 Modern Control Theory and Applications
Spring 2020

Instructor Prof. Babak Hejrati
Email: babak.hejrati@maine.edu
Office Location: 225 Boardman Hall
Phone: (207) 581-6889
Office Hours: TBD
TA Email: TBD

Class Schedule TBD
TBD
TBD

Course Description: (In-person lectures, Credits 3) This course introduces the state-space methods for analysis and design of linear control systems. The assumed prerequisites are undergraduate courses in linear algebra and dynamic systems and controls. The analysis part of this course is concerned with stability, controllability, observability, realization, and minimality of the state-space model, while the control design part delves into the methods of pole placement for state feedback and observer design, and optimal methods such as linear quadratic regulator (LQR) and Kalman filter. Students will also learn how to apply the theory to engineering problems using MATLAB for both continuous-time and discrete-time systems.

Prerequisites: MEE 370. Graduate Standing in MEE or permission of instructor.

Technical Software: MATLAB and Simulink Student Suite. Download and use version R2019b from https://umaine.edu/it/software/matlab/.

Course Notes: Students should make sure that their Blackboard account is set up to receive all the announcements and relevant materials.

Course Goals: This course teaches the fundamentals of modern control theory and its engineering applications. The main goal of this course is to provide students with basic tools in modeling, analysis and design for control and estimation based on the state-space approach. The knowledge gained through this course is essential for more recent and advanced control courses such as nonlinear control, robust control, optimal control, adaptive control, digital control, sampled-data control, hybrid control, and system identification. The approach is to provide a strong underpinning, rather than a cookbook approach, in order that the students may more readily apply concepts to new situations. It is assumed that the students are very well familiar with topics in classical control such as transfer function, linear time-invariant systems, and feedback control systems and have a good grasp

of linear algebra and matrix mathematics. The state-space techniques developed in this course are applicable to various types of engineering and even non-engineering systems such as aerospace, mechanical, electrical, electromechanical, fluid, thermal, biological, and economic systems. This is because such systems can be modeled mathematically by the same types of governing equations. The modeling is not formally addressed in this course, rather we present the tools for developing a linear time-invariant state-equation model of the physical system under study. With mathematics as the unifying language, the fundamental results and methods presented here are amenable to translation into the application of interest.

Instructional Objectives:

1. Review linear algebra and matrix mathematics with emphasis on eigenvalues and eigenvectors.
2. Introduce state variables and state-space descriptions of linear time-invariant (LTI) dynamic systems.
3. Teach the realization of the state-space model as well as the relationship between transfer-function and state-space representations.
4. Develop the ability to analyze continuous-time and discrete-time linear systems to determine controllability, observability, and stability characteristics.
5. Introduce the design of state feedback control and observer.
6. Teach optimal methods including linear quadratic regulator (LQR) and Kalman filter.

Learning Outcomes: By the end of this course, students will be able to

1. Formulate the state-space models for continuous- and discrete-time LTI dynamic systems.
2. Determine solutions to the state equations by a variety of methods.
3. Determine various properties of these systems including stability, controllability, and observability.
4. Design state feedback controllers and state observers.
5. Design optimal controllers and estimators such as LQR and Kalman filter.
6. Apply the theory to engineering problems using MATLAB (e.g., creating state-space models, evaluating a system's response to different inputs, implementing optimal control algorithms).

Grade Distribution (Undergraduate Students):

Homework	20%
Midterm 1	20%
Midterm 2	20%
Computer Projects and Labs	20%
Final Exam	20%
Extra-credit quizzes	5%

Grade Distribution (Graduate Students):

Homework	10%
Midterm 1	20%
Midterm 2	20%
Computer Projects and Labs	15%
Final Project	15%
Final Exam	20%
Extra-credit quizzes	5%

Letter Grade Distribution:

>= 93.00	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	<= 59.99	F

Course Policies:

- **General**
  - Attendance is required in this class and missing more than **three** lectures results in losing 5 points of your final accumulative grade out of 100.
  - Laptop computers may only be used to take notes. The use of cell phones is strictly prohibited in the classroom.
- **Exams**
  - Two midterm exams and an accumulative final exam are scheduled. All the exams will be **closed book, closed notes**. You can bring one **two-sided formula sheet** (i.e., you can write on both sides) and your calculator on the exam session.
  - The midterm exams are designed to take 50 minutes, while the final exam can take up to 2 hours and include the last lecture before the final exam.
  - **No makeup midterms or exams will be given.** In the event of a missed exam, a make-up exam will be possible only if student provides a valid document for the conflict. Missing a midterm or final exam will result in zero as a grade for that midterm or final examination.
- **Homework**
  - Homework problems will be assigned when appropriate materials are covered. Make sure you do the homework problems since they are the bases for the midterm and final exams.
  - **Grad Only** problems are designed only for graduate students.
  - Homework will be due at the beginning of the class on the assigned due day.
  - **Late homework will not be accepted**. You are responsible for knowing and submitting the assigned homework if you are absent from class.
  - Students are expected to work independently. **Offering** and **accepting** solutions from others is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the Academic Honesty Policy**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the professor, tutor, or lab assistant.
  - Students are encouraged to make use of the instructor office hours. If you have any questions or concerns, **please do not hesitate to come and visit the instructor and/or the TA**. We will make sure to assist you as much as possible.
- **Projects and Labs**

- A total of two or three computer projects (MATLAB and Simulink) will be assigned throughout the semester. The computer projects will cover the concepts taught in the class preparing students for real-world applications. **Students are expected to do the computer projects on individual basis.**
- The labs are designed to provide students with hands-on experience. We will use the haptic paddle located in room 202 at the Crosby Hall, and students will work in **groups of 4 to 5 students** to do the lab assignments and submit **one report per group.**
- **Graduate students are required** to work **independently** on a **final project.** They should **consult with the instructor** to determine their project's subject **before the second midterm exam** and they should **submit a report in an IEEE conference paper format** as provided on the Blackboard by the **end of the semester.**

- **Extra-Credit Quizzes**
  - Students will take several extra-credit quizzes throughout the semester. These quizzes are for **extra credits**, and they provide good opportunities for students to make up for some points that they may have lost in other sections. Also, these quizzes are excellent check points for students to evaluate their undersigning of the course materials.
  - The quizzes are short (i.e., they usually take about 5 minutes) and test the students on the basic concepts covered in the class and homework assignments. The quizzes do not require students to use a calculator; only the lecture notes will be sufficient.

Academic Honesty Policy Summary: Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.

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> **If you want to talk in confidence** to someone about an experience of sexual discrimination, please contact these resources:
>
> *For confidential resources on campus:* **Counseling Center: 207.581.1392** or **Cutler Health Center: at 207.581.4000.** *For confidential resources off campus:* **Rape Response Services:** 1.800.310.0000 or **Spruce Run:** 1.800.863.9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For support services on campus: **Office of Sexual Assault & Violence Prevention: 207.581.1406, Office of Community Standards: 207.581.1409, University of Maine Police: 207.581.4040 or 911.** Or see the OSAVP website for a complete list of services at `http://www.umaine.edu/osavp/`

Course Schedule: This is a tentative schedule and the weekly coverage might change as it depends on the progress of the class.

- **State-Space Fundamentals**
  - State space representation of dynamic systems [Class 1&2]

  Assignment 1
  - Obtaining the state equations [Class 3&4&5]

  Assignment 2
- **Linear Algebra and Matrix Mathematics**
  - Basis, representation, and orthonormalization [Class 6]
  - Linear algebraic equations [Class 6&7]
  - Diagonal form and Jordan form [Class 7&8]
  - Eigenvalues and eigenvectors [Class 8]

  Assignment 3
- **State-space solutions and realizations**
  - Solution of LTI state-space equations [Class 9]
  - **Test 1** [Class 10]
  - Equivalent state-space equations [Class 11]
  - Realizations [Class 12]

  Assignment 4
- **Stability, Controllability, and Observability of Linear Systems**
  - Input-output stability of LTI systems [Class 13]
  - Internal stability and Lyapunov theorem [Class 14]

  Assignment 5
  - Controllability [Class 15]
  - Observability [Class 16]

  Assignment 6
  - Kalman canonical decomposition [Class 17]
  - Conditions in Jordan-form equations and controllability after sampling [Class 18]
  - **Test 2** [Class 19]
- **Design of State Feedback Controllers and State Observers**

- State feedback and output feedback [Class 20&21]

Assignment 7

- Pole placement using state feedback [Class 22&23]
- Observers [Class 24&25]

Assignment 8

- **Optimal Control**
  - Linear quadratic regulator (LQR) [Class 26&27]

Assignment 9

- Kalman filter design [Class 28&29]

Final Exam

Course Schedule Disclaimer (Disruption Clause): In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Observance of Religious Holidays/Events: The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

Graduate course proposals, modifications, or eliminations must be submitted to the Graduate School no later than the 3rd of each month. Please refer to the Graduate School website for the Curriculum Committee meetings schedule. Electronic signatures and submission is required.

Please return the completed e-form with appropriate signatures and documentation to the Graduate School by saving the form to your desktop and sending as an attachment to graduate@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

GRADUATE PROGRAM/UNIT Food Science and Human Nutrition

COURSE DESIGNATOR FSN COURSE NUMBER 542 EFFECTIVE SEMESTER Fall 2020

COURSE TITLE Sustainability, Nutrition and Health

REQUESTED ACTION

NEW COURSE (check all that apply, complete Section 1, and submit a complete syllabus):

- ☐ New Course
- ■ New Course with Electronic Learning
- ☐ Experimental

MODIFICATION (Check all that apply and complete Section 2):

- ☐ Designator Change
- ☐ Number Change
- ☐ Title Change
- ☐ Description Change
- ☐ Prerequisite Change
- ☐ Credit Change
- ☐ Cross Listing (must be at least 400-level)[1]
- ☐ Other (specify) _____

ELIMINATION:

- ☐ Course Elimination

ENDORSEMENTS

Please sign using electronic signatures. If you do not already have a digital signature, please click within the correct box below and follow the on-screen instructions.

Leader, Initiating Department/Unit(s)

5/13/2019

College(s) Curriculum Committee Chair(s) (if applicable)

5/28/2019

College Dean(s)

Graduate School [sign and date]

1. Courses cross-listed below 400-level require the permission of the Graduate School.

SECTION 1 (FOR NEW COURSE PROPOSALS)

Proposed Catalog Description (include designator, number, title, prerequisites, credit hours):

FSN 542 Sustainability, Nutrition, and Health: This course explores sustainable practices when growing, processing, transporting, distributing, choosing, preparing, and consuming food and how these practices affect the tripod of sustainability, i.e. environment, society (health) and economy in the context of the "Farm to Healthy Body" model. Applications for health professionals are addressed.
Prerequisites: FSN 410 and NUR 303 or permission.
Credits: 3

Components (type of course/used by Student Records for MaineStreet) - *Multiple selections are possible for courses with multiple non-graded components:*

- ☐ Applied Music
- ☐ Clinical
- ☐ Field Experience/Internship
- ☐ Research
- ☐ Studio
- ☐ Laboratory
- ■ Lecture/Seminar
- ☐ Recitation
- ☐ Independent Study
- ☐ Thesis

Text(s) planned for use:

Course Instructor (include name, position, teaching load):

Professor Dorothy Klimis-Zacas, Professor of Clinical Nutrition (50% teaching)

Reason for new course:

Part of curriculum for new Certificate offering in Human Nutrition

Does the course addition require additional department or institutional facilities, support and/or resources, e.g. new lab facilities, computer support and services, staffing (including graduate teaching assistants), or library subscriptions and resources?

- ◉ No. The department will not request additional resources for this course.
- ○ Yes. Please list additional resources required and note how they will be funded or supported.

What other departments/programs are affected (e.g. course overlap, prerequisites)? Have affected departments/programs been consulted? Any concerns expressed? Please explain.

How often will this course be offered? Will offering this course result in overload salary payments, either through the college or CED, either to the instructor of this course or to anyone else as a result of rearranging teaching assignments?

Every other Fall-even years

AND SOFTWARE REQUIREMENTS:

-High-speed internet access (DSL or cable)

-Mozilla Firefox web browser is recommended (available for download at no cost) http://www.mozilla.org/en- US/

-Adobe Acrobat Reader (available for download at no cost): http://get.adobe.com/reader/

-Microsoft Word (if you do not have Microsoft word, download Open Office for free at http://www.openoffice.org)

ACCESSING THE COURSE WEBSITE:

This course is located on Blackboard. You may access the course website by typing in *http://www.courses.maine.edu* into your Internet Browser's URL bar (Mozilla Firefox web browser is highly recommended). Please type in your username and password and click on the Login button. Your login information should be the same user name and password that are used to access your Maine Street account and your UNET (yourname@maine.edu) account. On the right side of the page under "My Courses", you will now see a list of courses. Please click on "FSN 542: Nutrition, Sustainability and Health". The Home page for this course will appear. On the left side of the page, you will see a course menu with links to the course syllabus, lecture units, assignments, exams, discussion and announcement boards. If you have any problems with logging in or need technical assistance, please contact:

Help Line Phone Number: 1-877-947-4357

Email: dlltechhelp@umit.maine.edu

COURSE DESCRIPTION

This course explores sustainable practices when growing, processing, transporting, distributing, choosing, preparing, and consuming food and how these practices affect the tripod of sustainability, i.e. environment, society (health) and economy in the context of the "Farm to Healthy Body" model. Applications for health professionals are addressed.

COURSE OBJECTIVES

Upon successful completion of the course the student will be able to:

1. Develop an understanding of how sustainable agricultural practices can affect the environment and ultimately human health.
2. Identify the components of a sustainable diet.
3. Understand the role of the individual, community, government, and the health professional in applying the principles of sustainability.
4. Understand the sociopolitical barriers and forces preventing change.
5. Develop critical thinking when evaluating literature in the related field.

UNIVERSITY OF MAINE
DEPARTMENT OF FOOD SCIENCE AND HUMAN NUTRITION
FSN 542 – Sustainability, Nutrition and Health
Course Information

Instructor:	**Dorothy Klimis-Zacas, M.S., PhD, FACN** **Professor of Clinical Nutrition** **Cooperating Professor** **School of Biomedical Science**
Office:	**232 Hitchner Hall, University of Maine, Campus**
Email:	**dorothea@maine.edu**

COURSE FORMAT:
All lectures, assignments and exams for this course are accessed via the Internet on **Blackboard at http://www.courses.maine.edu**. This course contains 13 units, which include pre-recorded weekly lectures. All units are available as shown in this syllabus under "Course Schedule".

TECHNICAL ASSISTANCE:
For all matters related to access to the course website and technical assistance, please contact the help center:
Help Line Phone Number: 1-877-947-4357
Email: dlltechhelp@umit.maine.edu

COMMUNICATING WITH THE PROFESSOR:
The main form of communication for this course will be online through Blackboard and email. For questions about course material, assignments and exams not answered in the assignment instructions, syllabus or announcements, please post questions for each other to the Discussion Board (see tab on course menu in Blackboard). Please use proper Netiquette, as your questions are viewed by the entire class. For questions to me please **email me at: dorothea@maine.edu.** I will try to respond within 24 hours if an email or post is received during the week (Monday – Friday). If you send a post or an email on Friday afternoon or over the weekend, you will receive a reply within 48 hours.

EXPLANATION OF COURSE FORMAT AND REQUIREMENTS

This course follows a weekly schedule. Please be sure to check the course schedule often (see below for course schedule) to complete assignments, and exams on time. Communications regarding assignments and tests will be made via Blackboard. The following components of the course may be accessed from the course menu on the left side of the page, once you are logged on to Blackboard.

Lecture Units

This course includes 13 units. These units are available on the course website under the "Lecture Units" tab. Within each unit, you will find a video of the lecture. Please read the assigned readings first, and then view the lecture video.

Exams

Two exams will be given over the course of the semester. Each exam will be available for 24 hours during the dates listed on this syllabus under "Course Schedule". Exams may be accessed from the **"Exam" tab** on the course website. **Please enter the dates of your exams in your personal calendar at the beginning of this course. Excuses of forgetting to take the exam or missing the exam due to inexcusable reasons will result in a 0 grade for the exam.** The number of minutes allotted for each exam will be 60. Once you begin the exam, you must complete it (**there is no pausing or stopping**). If you pause or stop, time stills runs. You must complete the exam within the allotted timeframe to receive credit for each exam. Your exam grades will be provided automatically via the course website on Blackboard.

Paper: Applying the principles of sustainable nutrition in the field (community, farm, food company, restaurant, hospital, at home, etc). Details will be given in class.

MAKE-UP POLICY

Absence from exams because of death or tragedy or illness must be reported to the instructor **prior to the exam**. A make-up exam will only be allowed for those students **1)** who are ill (with a doctor's note or health center note), **2)** who have an emergency (must show appropriate documentation), or **3)** who have a UMaine engagement (requires documentation, and you must email me 1 week prior to the **exam).**
Makeup exams will be not be given unless the instructor is contacted prior to the exam or the day of the exam (in case of illness).

GRADING

Exam #1: 40%
Exam #2: 40%
Paper: 20%

Course Requirements		Grading Determination			
1. Exam #1	100	A =	600 - 540	C =	449-432
2. Exam #2	100	A- =	539-522	C- =	431-414
3. Exam #3	100	B+ =	521-504	D+ =	413-390
4. Exam #4	100	B =	503-486	D =	389-372
5. Assignments	200	B- =	485-468	D- =	371-354
		C+=	467-450	F =	353- less
Total	**600 points**				

Academic Honesty Statement

Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.

Students Accessibility Services Statement

If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me privately as soon as possible.

Course Schedule Disclaimer (Disruption Clause)

In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Observance of Religious Holidays/Events

The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due

to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

Sexual Discrimination Reporting

The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of **sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination** involving members of the campus, **your teacher is required to report** this information to the campus Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For *confidential resources on campus*: **Counseling Center: 207-581-1392** or **Cutler Health Center: at 207-581-4000**.

For *confidential resources off campus*: **Rape Response Services:** 1-800-871-7741 or **Partners for Peace**: 1-800-863-9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For *support services on campus*: **Office of Sexual Assault & Violence Prevention: 207-581-1406**, **Office of Community Standards: 207-581-1409**, **University of Maine Police: 207-581-4040 or 911**. Or see the OSAVP website for a complete list of services at http://www.umaine.edu/osavp/

Netiquette

Netiquette refers to network etiquette. Please use proper netiquette when communicating via email and the question board. Read the "Core Rules of Netiquette" at http://ludost.net/nettiquette/0963702513p32.html before sending an email or posting to the question board in this course. More information about course netiquette may be found under the "Start Here" tab on the course website.

COURSE SCHEDULE

Units	Topics	Assignments
Unit 1	A Sustainable and Resilient Food System	
Unit 2	Health Benefits of Sustainable Food systems	
Unit 3	The Soil to Health Connection	
Unit 4	Herbicides, Pesticides, Fungicides- Food quality and Health	
Unit 5	Sustainable Agriculture practices: efficient and economic practices for environmental stewardship	
Unit 6	Sustainable post-harvest practices	Exam #1
Unit 7	Sustainable practices in food production, processing and distribution to reduce environmental footprint and promote health	

Unit 8	Sustainable practices in choosing, processing and cooking food including food waste	
Unit 9	Sustainable practices and disease: immune system, obesity, cancer, allergies, inflammatory bowel disease	
Unit 10	Local and regional food systems in sustainable diets	
Unit 11	Behaviors/policies/directives that impose barriers to change towards sustainable practices	
Unit 12	The role of the health care professional in supporting sustainable food systems	**Written Paper due**
Unit 13	Diet as a means of addressing human and environmental health	**Exam #2**

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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GRADUATE PROGRAM/UNIT School of Economics

COURSE DESIGNATOR ECO COURSE NUMBER 581 EFFECTIVE SEMESTER Spring 2020

COURSE TITLE Agent-Based Modeling

REQUESTED ACTION

NEW COURSE (check all that apply, complete Section 1, and submit a complete syllabus):

- ☐ New Course
- ☐ New Course with Electronic Learning
- ☐ Experimental

MODIFICATION (Check all that apply and complete Section 2):

- ☐ Designator Change
- ☐ Number Change
- ☐ Title Change
- ☐ Description Change
- ☒ Prerequisite Change
- ☐ Credit Change
- ☐ Cross Listing (must be at least 400-level)[1]
- ☐ Other (specify) _____

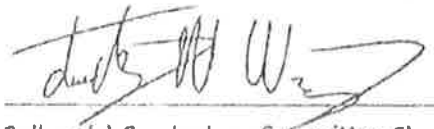
ELIMINATION:

- ☐ Course Elimination

ENDORSEMENTS

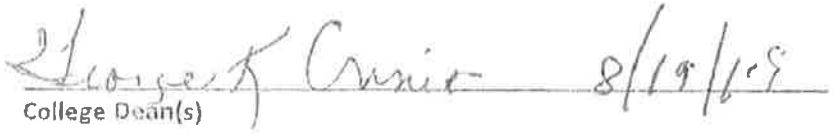
Please sign using electronic signatures. If you do not already have a digital signature, please click within the correct box below and follow the on-screen instructions.

Leader, Initiating Department/Unit(s)



Instructor and Graduate Coordinator, School of Economics

College(s) Curriculum Committee Chair(s) (if applicable)



8/19/19

College Dean(s)

Graduate School [sign and date]

1. Courses cross-listed below 400-level require the permission of the Graduate School.

SECTION 2 (FOR COURSE MODIFICATIONS)

Current catalog description (include designator, number, title, prerequisites, credit hours):

ECO 581 - Agent-Based Modeling
This skills-based course in the modeling of social-ecological systems, provides students the conceptual and computational tools they need to design, modify, test and build agent-based models of socio-ecological systems. It draws inspiration and theoretical perspectives from research on common pool resource dynamics, human cooperation, evolutionary game theory, and complex adaptive systems. Students will use the free, cross-platform modeling system called NetLogo to explore the dynamics of models, critique these models, modify and extend them.

Prerequisites & Notes
SMS 552 or permission.

Credits: 3

Proposed catalog description (include designator, number, title, prerequisites, credit hours):

ECO 581 - Agent-Based Modeling
This skills-based course in the modeling of social-ecological systems provides students the conceptual and computational tools they need to design, modify, test and build agent-based models of socio-ecological systems. It draws inspiration and theoretical perspectives from research on common pool resource dynamics, human cooperation, evolutionary game theory, and complex adaptive systems. Students will use the free, cross-platform modeling system called NetLogo to explore the dynamics of models, critique these models, modify and extend them.

Prerequisites: Graduate standing or instructor permission.

Credits: 3

Reason for course modification:

The old prerequisite, SMS 552 is no longer offered.

SECTION 3 FOR COURSE ELIMINATIONS

Reason for Elimination

Please return the completed e-form with appropriate signatures and documentation to the Graduate School by saving the form to your desktop and sending as an attachment to graduate@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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GRADUATE PROGRAM/UNIT COEHD Instructional Technology

COURSE DESIGNATOR EDT COURSE NUMBER 616 EFFECTIVE SEMESTER Spring 2020

COURSE TITLE New Directions for Educational Technology

REQUESTED ACTION

NEW COURSE (check all that apply, complete Section 1, and submit a complete syllabus):

- ☐ New Course
- ☐ New Course with Electronic Learning
- ☐ Experimental

MODIFICATION (Check all that apply and complete Section 2):

- ☐ Designator Change
- ☐ Number Change
- ☒ Title Change
- ☒ Description Change
- ☐ Prerequisite Change
- ☐ Credit Change
- ☐ Cross Listing (must be at least 400-level)[1]
- ☐ Other (specify)

ELIMINATION:

- ☐ Course Elimination

ENDORSEMENTS

Please sign using electronic signatures. If you do not already have a digital signature, please click within the correct box below and follow the on-screen instructions.

Leader, Initiating Department/Unit(s)

Meredith Swallow Digitally signed by Meredith Swallow Date: 2019.04.15 10:25:25 -04'00'

College(s) Curriculum Committee Chair(s) (if applicable)

Sherrie Weeks Sherrie L. Weeks May 27, 2019

College Dean(s)

Graduate School (sign and date)

1. Courses cross-listed below 400-level require the permission of the Graduate School

SECTION 2 (FOR COURSE MODIFICATIONS)

Current catalog description (include designator, number, title, prerequisites, credit hours):

Seminar in Educational Technology is a course which allows students to investigate complex issues revolving around the use of instructional technology. Students who successfully complete this course will gain an understanding of the ways in which technology is used to support education. They will explore some of the barriers and challenges facing appropriate use of technology and will craft thoughtful responses to the major issues of today. The course is required for students enrolled in the Master's Program in Instructional technology.

Prerequisite- EDT 520 or permission. Credits 3

Proposed catalog **description** (include designator, number, **title, prerequisites,** credit hours):

This is a discussion and project-based seminar that explores how emerging technologies create new opportunities for learning and teaching. How do emerging technologies become instructional technologies that can aid learning and teaching, broadly defined? This course will explore the history of emerging technologies in education, from the advent of radio in the 1920s to the emergence of the world wide web, and use that history to examine the frontier of instructional technology. We will assess trends in displaying, representing, and interacting with information, and imagine how emerging technologies will create new opportunities for learning and teaching.

Reason for course modification:

The previous version of EDT 616 was outdated, and the revision reflects the dynamic nature of technology innovation and educational media.

SECTION 3 FOR COURSE ELIMINATIONS

Reason for Elimination

Please return the completed e-form with appropriate signatures and documentation to the Graduate School by saving the form to your desktop and sending as an attachment to graduate@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

Course: EDT 616
Course Title: New Directions for Educational Technology
Course Description: This is a discussion and project-based seminar that explores how emerging technologies create new opportunities for learning and teaching. How do emerging technologies become instructional technologies that can aid learning and teaching, broadly defined? This course will explore the history of emerging technologies in education, from the advent of radio in the 1920s to the emergence of the world wide web, and use that history to examine the frontier of instructional technology. We will assess trends in displaying, representing, and interacting with information, and imagine how emerging technologies will create new opportunities for learning and teaching.

Prerequisites: EDT 520 or permission.

Date Approved for 680 Endorsement: *(Program Coordinator will assist with this)*

Program Vision
The University of Maine Master's program in Instructional Technology is offered fully online and is designed to help students become leaders in effective and innovative uses of current and emerging technology. The required coursework, research, and clinical experiences are designed for educators working in a variety of contexts. Students will engage in inquiry-based curriculum and build capacity to continually assess their local context; implement technology to enhance teaching, learning and assessment; build professional learning networks to support ongoing professional development; and develop expertise in current and emerging instructional technologies. Essential to this program is a commitment to local community, advocacy for accessibility, and social justice, especially in the context of the potential for new technology to influence local educational settings.

Course Objectives:

The purpose of the course is to provide a context where students can research, explore, and discuss how technologies become integrated into classrooms. We will use what we find as lenses for considering emerging technologies and how they might create new opportunities for learning and teaching. Students will:

- Investigate the history of emerging technologies to develop an understanding of whether, when, why, and how they became widely adopted.
- Develop an understanding and awareness of the affordances of emerging technologies for learning and teaching.
- Explore the circumstances under which emerging technologies can become integral to education.

How does the course explore the central questions?

Question	Depth of Engagement 0=not at all 1= introduction 2=moderate 3==extensive
Learning Environments: How do educators leverage technology to create environments that support the development of diverse skills, and emphasize challenging learning experiences?	3
Teaching and Learning: How can technology enhance teaching and learning partnerships that support and promote innovative models of deeper learning?	3
Digital Citizenship: How can educators promote an understanding of the social, ethical and legal issues and responsibilities related to a globally connected society?	2

Program Assessment at UMaine:

- 2014 Program Assessment Plan approved by Provost
- Progress made to date predominantly at undergraduate level
- 2019-2020 introducing graduate program assessment workshops
    - Initial workshops focused on student learning outcomes
    - Pilot with UMaineGold programs in fall
    - Expanding to other programs late fall/spring 2020

Student Learning Outcomes Workshops

Fall 2019

Objectives:

- Discuss the importance of student learning outcomes and examples from other institutions
- Outline unique challenges pertaining to graduate learning outcomes,
- Develop or strengthen student learning outcomes specific to your discipline and degree program
- Publish student learning outcomes on program website (NECHE directive)
- Pilot with UMaineGOLD programs

Examples of student learning outcomes at the graduate level:

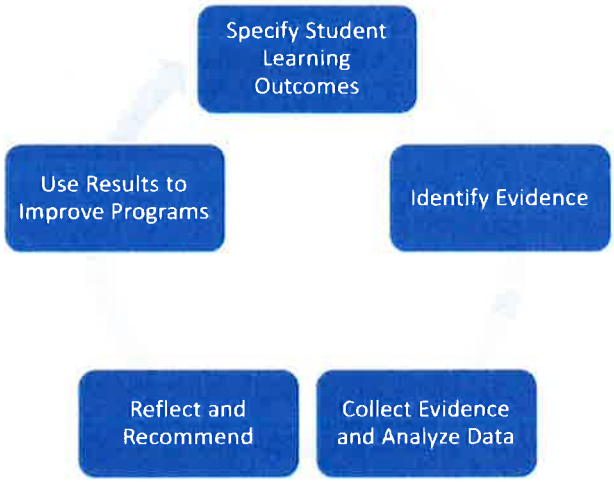
- Washington State University (https://gradschool.wsu.edu/student-learning-outcomes/)
- Drexel University (https://drexel.edu/provost/assessment/outcomes/grad-program/)
- Ohio State University (https://oaa.osu.edu/sites/default/files/uploads/irp/assessment/2017/2017_GraduateLearningOutcomes.pdf)
- Cornell University (https://gradschool.cornell.edu/degrees-fields/cugradfos/)

Graduate Program Assessment of Student Learning Outcomes

NECHE Standards: Program Assessment

8.1 The institution enrolling multiple student bodies, by **degree level**, location, modality, or other variables, develops and uses the data, evidence, and information below for each student body.

8.3 Assessment of learning is based on verifiable statements of what students are expected to gain, achieve, demonstrate, or know by the time they complete their academic program. **The process of understanding what and how students are learning focuses on the course, competency, program, and institutional level.** Assessment has the support of the institution's academic and institutional leadership and the systematic involvement of faculty and appropriate staff.



Student Learning Outcomes:

"....are directed goals that encompass the knowledge, skills, and abilities students should have achieved by the end of the program or course. SLOs emphasize what students can do with what they have learned, resulting in a product that can be evaluated" (CET&L, 2016).

Broad examples of Graduate learning outcomes:

- Demonstrate knowledge in the field of study
- Solve problems related to the field of study
- Communicate effectively (written and oral)
- Use a variety of sources and evaluate multiple points of view to analyze and integrate information
- Use appropriate technologies to communicate, collaborate, conduct research, solve problems and conduct reasoned arguments