



**Graduate Board**  
**Thursday, May 13, 2021**

**By Zoom:**

[Join Zoom Meeting](#)

ID: 95316865918

Password: 524358

[\(US\) +1 646-876-9923](#)

**3:00-4:30 pm**

AGENDA

1. Approval of the March 25, 2021 and April 22, 2021 Graduate Board minutes
2. Approval of the May 4, 2021 Graduate Curriculum Committee report
3. Review of Graduate Board membership and introduction of new members
4. Announcements/updates
  - Commencement feedback
  - Summer dissertation fellowships – announcement out
  - Faculty member in residence – still accepting applications
  - Orientation planning
5. New program proposal discussion:
  - Proposal for a Graduate Certificate in Engineering Applications of AI
  - Substantive change proposal for the MA in Financial Economics
  - Proposal for an interdisciplinary faculty group and concentration in Materials Science
6. Pursuing best practices in graduate mentoring
7. Items arising



**Graduate Board  
Thursday, March 25, 2021**

**By Zoom:**

[Join Zoom Meeting](#)

ID: 96865316980

Password: 874722

[\(US\) +1 646-876-9923](#)

**3:00-4:30 pm**

Meeting Minutes

Meeting called to order: 3:05pm

Attendance: P. Agrawal, J. Artesani, J. Ballinger, C. Beitzl, J. Bonnet, D. Bousfield, T. Bowden, S. Butler, A. Cruz-Uribe, S. Delcourt, D. Dryer, S. Ell, S. Fraver, J. Gill, W. Gramlich, N. Hall, S. Jain, Z. Jin, S. Klein, D. Klimas-Zacas, A. Knightly, A. Karapurkar, K. Kreutz, M. LaRocque, J. McClymer, E. McKillen, I. Mette, H. Onsrud, E. Pandiscio, F. Peterson, P. Poirier, L. Rickard, D. Rooks-Ellis, J. Stoll, K. Vekasi, V. Weaver, T. Yoo, S. Zare, J. Zydlewski.

1. Review/Approval of the February 25, 2021 Graduate Board minutes
  - Motion to approve – Sandy Butler
  - 2nd - Dylan DryerUnanimous approval of minutes
2. Approval of the March 2, 2021 Graduate Curriculum Committee report

New Courses:

CIE 557 Measurement Techniques in Water Resources  
SFR 555 Advanced Remote Sensing

Modifications:

FSN 695 Food Science and Human Nutrition Practicum  
SFR 520 Development and Growth of Plants

Motion to approve – Ian Mette  
2<sup>nd</sup> – Deborah Rooks-Ellis  
Unanimous approval

Questions and discussion about cross listing and co-listing within the same program.  
S.Delcourt will get the definitions of both for the Grad Board.

3. Announcements/updates

- Commencement update
  - i. Tentative plans – April 23 – 4:30pm – we will schedule all colleges to walk across the stage at the CCA.
  - ii. April 26-April 30 Virtual Hooding Ceremonies  
Deans have chosen the following dates and times:  
Monday April 26, 11-1pm: Graduate School of Business  
Wednesday April 28, 9-11am: College of Liberal Arts and Sciences and 2-4pm: College of Engineering  
Thursday April 29, 12-2pm – College of Natural Sciences, Forestry and Agriculture  
Friday April 30, 4:30-6:30pm – College of Education and Human Development
  - iii. Video Yearbook components will be added to the Commencement website
- Update on Graduate School financial awards
  - i. Executive Committee has completed deliberations on all fellowships, assistantships and scholarships, paying particular attention to balancing student academic credentials and equity of support across programs. In some cases where the Executive Committee did not have a clear preference partial awards were given which still reduce tuition to in-state rates for nonresident students.

The Waldron Fellowships are the most prestigious and this year went to:

Catherine Hamley, PhD, Ecology and Environmental Sciences  
Camden Bock, PhD, STEM Education  
Allison Brehm, PhD, Ecology and Environmental Sciences

[2021-2022 Graduate School Award Winners](#)

Students who received awards were sent letters. Students who are currently enrolled and have not been selected will be notified soon as well.

Flagship Doctoral Research Fellowship Funding – money allocated to the University through the Research Reinvestment Fund – President Ferrini-Mundy and Vice President Varahramyan hope to diversify enrollment at the Doctoral level and help to move UMaine to R1 status.

\$20K awards for 2 years. There are 5 awards being made competitively and only 8 applicants this inaugural year.

- Council of Graduate Schools awards  
Assistant and Associate Dean Award & Deborah Stewart are new awards this year.  
Dissertation awards are rotated among disciplines each year.  
Dissertation awards are for Biological Sciences and Fine Arts this year.  
Information on CGS awards:  
[https://cgsnet.org/ckfinder/userfiles/files/2021%20Call%20for%20nominations\\_ProQuest.pdf](https://cgsnet.org/ckfinder/userfiles/files/2021%20Call%20for%20nominations_ProQuest.pdf)
- Associate Provost searches– Jessica Miller will be our new Associate Provost for Faculty Development. Associate Provost for Student Success and Strategic Initiatives has not yet been announced.
- Assistant VP for Research – search is ongoing to a second AVP for Research to complement Ali Abedi’s role.

#### 4. TargetX (CRM) Update – Crystal Burgess (tabled from February meeting)

- RFP update – hoping for a resolution by end of April or beginning of May. (Request for proposal for our Customer Relationship Management Software.) Our current Target X contract expires in June – we will look for an extension if needed.

An option is to use the Salesforce platform itself – currently being used by Presque Isle, Fort Kent, and Graduate Programs at Farmington. (We are currently using a layered software – Target X with Salesforce.)

CIO – David Demers has final say in the product but, has asked the CRM users group to make a recommendation

Salesforce is very expensive as we pay for licenses for all users, etc...

The CIO is the one who requested that we review the CRM and go through the RFP process - luckily he is asking for feedback from all of the campuses & the target x user group is conducting the RFP process

Sharon Klein asked if the faculty users group could be solicited for feedback. Crystal will create a feedback document to solicit members.

- Email communications  
Communications used to be done manually by staff and GA's.  
2016 – prospects and inquiries  
2017 – moved into Target X and started communicating with students  
2018 – Fiona and Crystal created the full communications stream.  
2020 – moved data from live student information from a spreadsheet to the Target X database.  
New in 2021:  
Registration Reminders  
Missing Admission Materials  
Conditional Admit Outreach  
Inactive Student Warnings  
Shared the full communication report in the chat – it also appeared in the February Grad Board packet.

H. Onsrud asked about the inactive student communication – when are students inactive? We started with Fall 2019 – they were well beyond the term to have broken enrollment.

Next run will be full time students who last registered Fall 2020 and Spring 2020 for part time students.

Students receive a total of 3 emails in this series: 1) To get them back on course; 2) Option to go on leave; 3) Warning about being inactivated and defining what that means (may have to reapply, etc...)

2-3 weeks later, they get an email that says they are now “inactive”.

If a student is studying abroad, they do have to submit a form to the Graduate School and the Office of International Programs in order to remain active.

Graduate School does track conditions placed on student admission.

ACR (Low Grade Report) - used to follow up with programs regarding students who have academic standing issues.

## 5. UMS Graduate Faculty appointment

### **Proposed Constitutional Amendment to Article III (Graduate Faculty)**

**Rationale:** Recognizing that single accreditation of the University of Maine System raises some questions about the role of faculty from other UMS institutions with regard to teaching UMaine courses and/or possibly serving on student committees. Given that one of the goals of unified accreditation is to facilitate greater interaction and cooperation across UMS institutions, UMS faculty have a potentially greater role in UMaine graduate education than that of external graduate faculty. However, given that UMS institutional missions vary, UMS faculty will not necessarily possess the scholarship qualifications of UMaine graduate faculty, and therefore, programs should have great discretion in

the role(s) that other UMS faculty serve. This amendment, therefore, proposes a new category of Graduate Faculty entitled *UMS Graduate Faculty*.

**UMS Graduate Faculty.** UMS Graduate Faculty are tenured or hold tenure track faculty appointments at a University of Maine System institution other than the University of Maine. Should two UMS academic units wish to enter a *Cooperating Departments agreement* at the graduate-curriculum level, UMS Graduate Faculty may be assigned UMaine graduate level (500/600) classes. Recognizing the varied missions of the 7 UMS institutions with regard to teaching and scholarship, UMS Graduate Faculty would not necessarily be active participants on student thesis and dissertation committees. However, those faculty members whose academic and research engagement enable them to make an active contribution to a graduate student's research may serve on a committee, as well as co-chair or chair a committee at the discretion of the graduate program and the University of Maine Graduate School.

To better support unified accreditation  
New category of Graduate Faculty specific for faculty within the UM System  
The statement allows the program to determine the specific role of the faculty who are appointed as UMS Faculty.

J.McClymer – concerned about a potential inequity for committee selection. To chair a committee – UMS faculty would need to have credentials equivalent to Full Graduate Faculty.

A. Knightly – asked about an agreement to chair or co-chair committees. Can faculty at other institutions chair graduate committees? (S. Delcourt responded that they would likely co-chair if the program and the Grad School agreed.)

H. Onsrud noted that we are in the midst of this right now with the MS in data science and engineering – proposal that went to the Board of Trustees involves UMS faculty from multiple campuses.

J.McClymer responded that based on the Cooperating Departments agreement in the AFUM contract, faculty from the degree granting institution have discretion over faculty participation from other UMS campuses.

Delcourt stated that Constitutional amendments require a 30 day discussion period. We would bring this up for a vote at the next Graduate Board meeting.

6. Items arising

Outstanding Student awards (certificates) – if your program does designate an outstanding graduate student, we will recognize these students on the Commencement site and the Graduate Student Government will also recognize students at their own ceremony this year.

Meeting Adjourned at 4:40PM



**Graduate Board**  
**Thursday, April 22, 2021**  
**By Zoom:**

[Join Zoom Meeting](#)

ID: 92177775900

Password: 158272

[\(US\) +1 301-715-8592](#)

**3:00-4:30 pm**

AGENDA

Meeting convened: 3:06pm

Attendance: P. Agrawal, J. Artesani, J. Ballinger, C. Beitzl, J. Bonnet, D. Bousfield, T. Bowden, S. Butler, A. Cruz-Uribe, S. Delcourt, D. Dryer, S. Fraver, J. Gill, H. Greig, W. Gramlich, S. Jain, Z. Jin, S. Klein, A. Knightly, A. Karapurkar, K. Kreutz, M. LaRocque, J. McClymer, E. McKillen, I. Mette, S. Ohno, H. Onsrud, E. Pandiscio, F. Peterson, P. Poirier, L. Rickard, S. Smith, J. Stoll, K. Vekasi, V. Weaver, T. Yoo.

Guests: Alessio Mortelliti (Proxy for Carly Sponarski), Crystal Burgess, John Allen.

1. Approval of the April 6, 2021 Graduate Curriculum Committee report
  - New Courses
    - CSD 680 – Communications Sciences and Disorders
    - ERL 570 – Designing Online Learning Experiences
    - ERL 576 - Literacy in the Home, School, and Community
    - ESC 556 – Climate Change Education
    - EAD 567 – Ed Leadership – Stakeholder Engagement
    - EAD 600 – Ed Leadership – Educational Research for School Leaders
  - Previously reviewed by Graduate Curriculum Committee
    - ENG 600 – Intro to Grad Studies in English
    - SFR 530 – Wood Physics

Motion to accept: Susan Smith, 2<sup>nd</sup>: Terry Yoo  
Unanimous approval

## 2. Announcements/updates

- Several questions have been raised regarding virtual hooding. Lists of participating students have been sent to the respective college dean's offices.
- Executive Committee has completed its deliberations on the Flagship doctoral fellowships. Sandra De Urioste-Stone substituted for Carly Sponarski who is on family leave. Those faculty who were selected for awards were Susan Smith, Owen Smith, Laura Rickard, Emily Haigh and Christine Beitzl. Congratulations!  
Scott has asked Jason Charland that the timeline for making decision on awards be done sooner (like the Waldron and Chase awards).  
A.Cruz-Uribe - suggested that we bump it up even earlier – so that we can use as a recruiting tool. (decisions made by late fall). T. Yoo agreed that in recruiting international students, they need to know earlier so that they can prove financial support. Scott will pursue this with Jason.
- Summer dissertation fellowships – June, July, and August stipend – and the possibility of a room in Stodder for writing. This will continue this year with a call for nominations coming out in early May.
- Commencement update – The Graduate School is accommodating late entries to the best of our abilities. Email [umhooding@maine.edu](mailto:umhooding@maine.edu) with any questions.
- Faculty member in residence – The Graduate School is searching for applicants for the Stodder faculty member in residence – to live in the 2BRn apartment and work with the Graduate School and 2 graduate student community coordinators to support the residence hall population. Scott will share the posting with Grad Board
- Graduate Board membership those promoted to Associate Professor with tenure:
  - i. Deborah Rooks-Ellis
  - ii. Alicia Cruze- Uribe
  - iii. Carly Sponarski
  - iv. Kimberly Huguenard (who will be joining GB)

Congratulations to all!!!

Delcourt announced that Carly Sponarski is taking a new position in Edmonton, Alberta and will be leaving the University. She was on both Executive Committee and Graduate Board. We will miss her many contributions.



Next month, we will review GB membership and welcome any new members attending.

3. New program proposal discussion:

- PSM and Graduate Certificate in Electrical Engineering Technology –
  - John Allen – expressed the need for management training in for engineers since they tend to get promoted within the first 5 years of their career. This certificate and professional science master’s program will help address this need.
    - Motion to approve – Jim McClymer, 2<sup>nd</sup> – Kristin Vekasi
      - Unanimous decision to move forward.
- Graduate Certificate in Engineering Applications of AI – Mohammad Musavi plans to discuss this proposal with Dean Humphrey regarding possible revisions. The proposal will likely come forward to GB next month.
- MEE graduate concentrations – Jin Zhihe explained that the four proposed concentrations in: Aerospace, Off Shore Wind Energy, Robotics and Mechatronics, and Smart Manufacturing reflect the primary academic and research areas of the MEE faculty. The concentrations are optional for students and not required.  
Harlan Onsrud moved to approve, Jin Zhihe 2<sup>nd</sup> the motion.

Discussion: H. Onsrud: Can these courses double count for meeting degree requirements? S. Delcourt: Yes – consistent with undergraduate academic policy, concentrations are not degrees, and therefore, relevant courses may be used to meet multiple concentration requirements. Policies related to graduate concentrations are outlined in the [Policies and Regulations](#) document and in the [Graduate Catalog](#).

S. Klein had a question regarding the maximum number of courses listed in each concentration and for the MS degree.

Jin responded that 30 cr is the minimum for a MS degree. He agreed that the language on the maximum number of supporting courses is a bit confusing and will be revised.

S. Klein suggested adding: ECO 505: Sustainable Energy Economics and Policy to the Offshore Wind concentration for a supporting course.

S. Jain – In the Offshore Wind concentration – three CIE courses are listed and there should be prerequisites noted for CIE 564 – CIE 460, or CIE 565 or instructor’s permission. We would like to see an undergrad course in soil mechanics before taking CIE 564.

Unanimous approval to move forward with the proposed concentrations above.

- Accelerated program agreement in History with USM (no vote needed)
  - Agreement included in the packet – similar to some current 4+1 programs between UMS campuses (intermedia and special education). Delcourt noted that this could be a blueprint for other accelerated programs between UMS campuses. The biggest issue to be negotiated is which courses will count towards both.
  - USM does have some 300 level courses that would count as if they were 400 level courses given that their course numbering system is different than UMaine's.
  - E. McKillen noted that USM students would take courses in senior year (from either USM or UMaine) to count toward both undergrad and grad programs, and they would come here for a year (UMaine) and finish. It is not a thesis program – just a coursework-based program.
  - L. Rickard – how to market a non-thesis program like this? E. McKillen said it would shorten the time to finish a master's degree program. Delcourt agreed that the advantage for students is the double-counting of credits and the fact that UMaine charges by student level so that undergraduate students can take graduate courses for the undergraduate tuition rate.
  
- Accelerated Pathways Program in Business Administration (no vote needed) Jamie Ballinger - 4+1 agreements exist with other UM System campuses – but nothing with UMaine yet. We are backtracking and created an “accelerated pathways” for UMaine undergraduate as well. Courses cannot be double counted, but students can complete the program in 5 years. Program should be entitled: Accelerated Pathways.
  
- Program modifications to MA in French and MAT in French and Spanish (no vote needed)
  - This proposal came forward to the Dean of Liberal Arts and Sciences, but never made it to the Graduate School. Some minor curriculum modifications are proposed, mostly course substitutions. MLC is proposing to include graduate courses in Education in their degree programs. Jim Artesani noted that this would not impose any significant course demands on these graduate courses.
  
- 4. UMS Graduate Faculty appointments (final review of revised policy)
  - H. Onsrud had expressed concerns about the counting of appropriate UMS courses toward UMaine degrees as transfer credit, so one line was added to the proposed amendment acknowledging that programs may still accept UMS courses as transfer credits.

**Proposed Constitutional Amendment to Article III (Graduate Faculty)**  
*New revision is highlighted*

**Rationale:** Recognizing that single accreditation of the University of Maine System raises some questions about the role of faculty from other UMS institutions with regard to teaching UMaine courses and/or possibly serving on student committees. Given that one of the goals of unified accreditation is to facilitate greater interaction and cooperation across UMS institutions, UMS faculty have a potentially greater role in UMaine graduate education than that of external graduate faculty. However, given that UMS institutional missions vary, UMS faculty will not necessarily possess the scholarship qualifications of UMaine graduate faculty, and therefore, programs should have great discretion in the role(s) that other UMS faculty serve. This amendment, therefore, proposes a new category of Graduate Faculty entitled ***UMS Graduate Faculty***.

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Recognizing the varied missions of the 7 UMS institutions with regard to teaching and scholarship, UMS Graduate Faculty would not necessarily be active participants on student thesis and dissertation committees. However, those faculty members whose academic and research engagement enable them to make an active contribution to a graduate student's research may serve on a committee, as well as co-chair, or if meeting the program's criteria for Full Graduate Faculty, chair a committee at the discretion of the graduate program and the University of Maine Graduate School.

- H. Onsrud raised some questions about how this amendment might impact faculty governance of the MS in data science and engineering (DSE) program. S. Delcourt will work with H. Onsrud on implementing graduate faculty appointments within the DSE program.
- J. McClymer noted that the Cooperating Departments Agreement was brought forward to make it much easier to go between schools in the system...rather than having to create a bunch of MOU's.

Unanimous approval for the revised amendment to the Constitution. The amendment passes and will become a part of the Graduate School Constitution.

Delcourt noted that Jason Charland has been working with faculty at other UMS schools who are interested in research, so the UMS graduate faculty category

will help this effort. The University is also trying to set up teaching fellowships for doctoral students who wish to have more extended teaching experience on their CVs. The plan is that they would serve as instructor replacements for other UMS faculty who are on research sabbaticals working with UMaine faculty.

5. Pursuing best practices in graduate mentoring

- Brian Olsen who is now the new Associate Provost for Student Success and Strategic Initiatives recently met with the Executive Committee to discuss best practices in graduate student mentoring. What happens in the case where a research mentor is taking advantage of a graduate student? What would be the best way to prevent this from happening? Conversely, how should a PI deal with a graduate student who is supported on a research grant but does not meet the expectations of the grant? A document outlining the expectation for both research mentor and graduate students is needed.

L. Rickard suggested: The NSF-NRT programs all have to extensively (per NSF mandate) document mentoring activities and this is a good place to look for examples

Steneck, N. H. (2007). Introduction to the responsible conduct of research, Office of Research Integrity, U.S. Department of Health and Human Services Committee on Science, Engineering and Public Policy, National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On being a scientist: Responsible conduct in research, National Academy Press, Third Edition.

S. Fraver – suggested that frequent committee meetings are a great idea and that we should also involve graduate students as this can be a two way street.

S. Delcourt asked that if anyone would like to serve on this committee to let him know. We would like to get the committee up and running this fall.

6. Items arising

- May 13 meeting: Delcourt announced that we will introduce new Grad Board Members and approve any remaining courses and program proposals before the end of the year.

Meeting Adjourned: 4:40PM

## CURRICULUM COMMITTEE REPORT

The Curriculum Committee met on May 4th, 2021 and, is recommending the following courses to the Graduate Board for approval at its May 13th meeting.

### *New Courses:*

**CMJ 540** Social Media and Digital Cultures

**ECE 591** Deep Learning

**EET 514** Printed Circuit Board Design

**EET 515** Automation and Integration

**EET 560** Renewable Energy and Electricity Production

**EET 584** Engineering Economics

**SFR 548** Quantitative Social Science for Natural Resource Management

**SFR 589** Tools for Consulting Foresters

**SPA 519** Rebels and Realists in 19C Literature

### *Modifications*

**COS 565** Data Visualization

**EHD 586** Seminar: Action Research in Pre K-12

*Modifications continued*

**MEE 554** Theory of Elasticity

**MEE 562** Advanced Fluid Mechanics

**PSE 581** Scientific Communications II

**SIE 507** Information Systems Programming

**SIE 515** Human Computer Interaction

**SIE 554** Spatial Reasoning

**SWK 571** Trauma Theory and Treatment in Social Work Practice

*Previously Approved Courses*

**BEN 551** Biological and Medical Image Analysis I

**BEN 552** Biological and Medical Image Analysis II



### 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 Communication and Journalism

COURSE DESIGNATOR CMJ COURSE NUMBER 540 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Social media and digital cultures

#### 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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)



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

**Thane Fremouw** Digitally signed by Thane Fremouw  
Date: 2021.04.15 10:00:48 -04'00'

College Dean(s)

 04, 14, 2021

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):

CMJ 540: Social media and digital cultures  
3 credit hours

Instructor permission - Graduate standing AND permission.

This course explores the digital cultures created through social media, the processes that go into their creation, and the impact these cultures have on individuals, groups, society at large. We will take a close look at how participation in digital platforms and on social media contributes to these collaborative, user-driven cultures, and examine the extent to which these cultures interact, impact, and reflect mainstream cultures. The creation of digital cultures is inexorably tied to identity performance and the conceptualization of social media as a potential virtual public sphere. Social media platforms are also often seen as a space for marginalized groups to connect, be heard, and influence dominant narratives. At the same time, corporations, hackers, and trolls are active players on social media sites as well, creating a space that is characterized by a wide array of voices and goals. In this course, we will examine all of these topics and explore the role these different variables play in the creation of digital cultures through a consideration of relevant theories, extant research, and specific case studies. Students will also become familiar with some of the methodologies associated with research into digital cultures.

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:

This course relies on articles (a sample syllabus has been attached). Since the field of social media research is in constant flux, using articles that reflect the latest developments in the fields ensure students engage with the latest knowledge.

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

Dr. Judith E. Rosenbaum-Andre, Associate Professor & Chair, 1-1 teaching load

Reason for new course:

This course has been offered as a special topics course by the Department of Communication and Journalism in fall 2017 and fall 2019. In both cases, enrollment for the course was in the double digits. The department is looking to adapt the graduate curriculum to better reflect developments in the field and in other graduate programs. The study of digital media platforms has become a major part of the discipline of Communication and this course will allow CMJ to capture the latest trends in the field. To date, CMJ does not offer a graduate course that covers theories and methods pertaining to social media platforms. In recent years, the department has hired two new faculty members who specialize in digital media platforms (Rosenbaum and Couture Bue) and has enrolled numerous masters and doctoral candidates who do research that focuses on or utilizes digital media in some way. This course is paramount to ensuring that the students' coursework reflects the faculty's area of research and that students are able to build their research on the latest developments in the field. This course will be one of the electives offered in the program.

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.

There is no overlap with other departments and programs. This course is also offered for majors in the Masters in Data Science Engineering program.

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?

This course will be offered every other fall, in odd years. This course is part of Dr. Rosenbaum's regular teaching load.



CMJ 540 – Fall 2021

## **CMJ 540: Social Media and Digital Cultures**

Fall 2021  
Wednesday 5:00-7:30pm  
Dunn Hall 424

Instructor: Judith Rosenbaum-Andre, PhD  
Dunn Hall 414  
[Judith.Rosenbaumandre@maine.edu](mailto:Judith.Rosenbaumandre@maine.edu)  
Office Hours: T 2-4pm, by appointment

### **Course description**

This course explores the digital cultures created through social media, the processes that go into their creation, and the impact these cultures have on society at large. We will take a close look at how participation in social media contributes to these collaborative, user-driven cultures, and examine the extent to which these cultures interact, impact, and reflect mainstream cultures.

The creation of digital cultures is inexorably tied to identity performance and the conceptualization of social media as a potential virtual public sphere. Social media platforms are also often seen as a space for marginalized groups to connect, be heard, and influence dominant narratives. At the same time, corporations, hackers, and trolls are active players on social media sites as well, creating a space that is characterized by a wide array of voices and goals. In this course, we will examine the role these different variables play in the creation of digital cultures through a consideration of relevant theories, extant research, and specific case studies. Students will also become familiar with some of the methodologies associated with research into digital cultures.

### **Learning goals and outcomes**

CMJ 540 combines the exploration of various theories with the examination of empirical research to improve your insight into the role played by social media in today's society and, more specifically, the creation and maintenance of digital cultures. You will develop sufficient familiarity with relevant theoretical concepts and research methods to critically consider the relationship between social media, digital cultures, and society at large, and design research that examines certain aspects of this relationship.

By the end of this course, you will be able to:

- Discuss theories about media use, citizenship, identity construction and performance, fan labor, and convergence cultures;
- Apply these theories and related concepts to specific case studies involving social media and digital cultures;

CMJ 540 – Fall 2021

- Situate your own scholarly perspective in the debate surrounding the creation of culture and the maintenance of democracy on social media platforms;
- Write about the relationship between social media and digital cultures in a critical and theoretically founded manner;
- Develop a familiarity with the research methods most commonly used to research social media;
- Prepare and lead a group discussion;
- Collect data from social media platforms;
- Perform basic research analysis of social media data;
- Conduct research that examines a specific aspect of the relationship between social media and digital cultures.

**Credits:** 3

**Prerequisites:** Graduate standing and instructor approval

### **Texts and technologies**

Your reading for this course consists of a packet of articles. This packet will be made available through a Google Drive folder shared with the class as well as BrightSpace. You will also find a list of readings for each week in the course schedule.

### **Course policies**

#### *Class attendance*

University policy states that students are responsible for attending all class meetings. Failure to regularly attend class may impact your ability to successfully complete this course.

If you have to miss class, please read through the following information carefully. Your number of absences (excused or unexcused) may not exceed the number of credit hours of the class. If your absences exceed this number (in the case of this class, that is three absences), the instructor may drop your final grade by 5 points. Accepted excuses include: sickness, jury duty, court summons, or health-related emergencies. Please note that personal circumstances such as car problems, family problems, and work scheduling issues do not count as excused absences. Absences will only be excused with appropriate medical and/or legal documentation. This documentation will be accepted up to a week after missing class. If you have an excused absence, please note that you are expected to turn in missed work the day you return to class. If you believe you have extenuating circumstances that should permit you to turn your work in later, it is your responsibility to provide documentation proving this. If you miss class without an excuse, you are not allowed to turn your work in late. If you have to miss class because of a University-sponsored athletic event or other activity, you must provide appropriate documentation, preferably in advance. Accruing extensive absences (even if these absences are for legitimate reasons), may mean you are not be able to meet the course objectives. In that case, please schedule a meeting with me so we can discuss your options. If you have an unexcused absence on the day of a presentation or other in-class activity, you will not be permitted to make

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this up. When you miss class, you are responsible for catching up on any notes and/or classroom material. Attendance will be taken at the start of class. In the professional world being late to a meeting is unacceptable and unprofessional. Hence, if you are not present when roll is taken, you will be counted as absent.

#### *Classroom behavior*

You are expected to be in the classroom on time, prepared to begin, and stay throughout the entire class period. Arriving to class late is disruptive and unprofessional, as is leaving early. If you know you will be late to class due to a reason outside of your control, you will need to let me know in advance. Failure to do so will mean you may be marked absent (see above). If you leave early without discussing this with me in advance, you will also be marked as absent.

Even though this is a class about social media, I expect all cell phones to be put away at the beginning of class. Using a laptop to take notes is acceptable, using it to message, text, or check your social media accounts is not, and will distract you and your peers from learning. Any constructive contributions to the class are highly encouraged. However, side-conversations will not be tolerated.

Please note that late work is not accepted. If you believe you have an acceptable excuse for turning your work late, you will need to provide documentation proving this as soon as possible (but no later than a week after missing the deadline. Note: This does not apply to the final project).

You are expected to attend class and behave in a responsible and mature manner. This class will address sensitive topics related to race, ethnicity, gender, and identity, and I expect you to discuss these in a civil and responsible way. Your contributions to class discussion should not merely consist of your personal opinion, but should instead reflect the body of knowledge accrued throughout this and other classes. The use of any sort of racial slurs and demeaning language will not be tolerated. Students who use inappropriate language in any context other than for illustrative purposes will be asked to leave the classroom. Having said this, I encourage all dialogue, as long as it is carried out in a respectful manner

#### *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. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314 (\*Date Issued: September 1, 2020):

<https://www.maine.edu/board-of-trustees/policy-manual/section-314/>

#### *Students with disabilities 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.

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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.

#### *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 **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/>

#### *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.

#### *Course Schedule Disclaimer (Disruption Clause)*

In the event of an extended disruption of normal classroom activities (due to COVID-19 or other long-term disruptions), 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.

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### *Librarian's Office Hours*

Jen Bonnet, the liaison librarian for the Department of Communication and Journalism, will have weekly office hours in Dunn 429. In Fall 2019, the office hours will be on Tuesdays and Wednesdays, 2:00–3:00pm. This is an excellent opportunity to get help with research for your assignments, as well as develop your information literacy.

### **Grading and assignments**

#### Participation

Attend all classes, active and critical participation in discussion	15%
Discussion leader (incl. prep)	15%
Weekly response papers (10/11)	10%
Critical reflections (4)	20%
In-class work	10%
Thinking-Aloud technique (week 2)	
Analyzing visual images (week 4)	
Grounded theory analysis (week 7)	
Data collection (week 9)	
Risk communication and selfies (week 10)	
Research Project	30%
Prospectus	5%
Presentation	5%
Final paper	20%

#### Grading Scale:

A: 94-100%	B+: 87-89%	C+: 77-79%	D: 60-69%
A-: 90-93%	B: 83-86%	C: 73-76%	F: 59% and below
	B-: 80-82%	C-: 70-72%	

Please note that any work that receives a grade in the C-range is not considered adequate for a graduate course.

### *Participation*

Coming to class and participating is essential for your success in this course. Participation involves more than simply showing up, however. As a seminar course, CMJ 540 hinges on your active, informed, and critical participation. Active involvement with the material is also essential to the success of any graduate student. Asking questions, debating concepts, and engaging with the themes presented each week will help you develop a better understanding of the role social media play in the development of digital cultures. As with any graduate seminar, this course is built on the assumption that you have prepared that week's class. You are expected to complete your reading and submit your weekly response paper on time, and be ready and willing to engage in discussion about it. Come prepared with questions and comments about that week's reading, as well as any other information that you may have uncovered and you think is relevant.

### *Weekly responses*

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Each week (with the exception of weeks 1, 13, 14, and 15) you will turn in a short response to the weekly readings. The purpose of this response is to show that you have read and given thought to the assigned materials and to help you organize your thoughts for class on Wednesdays. This response will consist of two parts: 1) A brief discussion of ideas and concepts that stood out to you in the readings (absolutely no more than 150 words) and 2) 3-4 questions that can be addressed in class. This weekly response must meet the following criteria:

- Adheres to APA standards
- In a .doc format (or its equivalent – if I can't open it, I can't grade it).
- Emailed to me by Wednesday morning 9am

### *Critical reflection*

Four times during this semester, you must turn in a critical reflection of that week's readings. You will sign up for the weeks for which you will write this reflection in week 1. In this reflection, you will respond to that week's readings by reflecting on the theories and concepts discussed in the reading. Please note that these reflections need to be more than a summary of the readings. The point of this reflection is to show that you have read and given thought to the assignment materials. You may discuss how the theories and concepts relate to the empirical research that is part of the readings, and/or discuss how the material you read for this week relates concepts and theories introduced in previous classes or other courses. You may also discuss how the readings connect to your own research interests, provide a critical reflection of the value of the theories/ concepts, or critique the research that is part of the reading. You should also include a few questions you would like to address in class. If a certain topic is of particular interest to you, I highly encourage you to venture outside the assigned reading. I am always open to suggest additional readings.

Each critical reflection has to meet the following criteria:

- Between 250-500 words long, double-spaced, Times New Roman, 12-point font
- Adheres to APA standards
- In a .doc format (or its equivalent – if I can't open it, I can't grade it).
- Emailed to me by Tuesday morning 9am

When grading your critical reflections, I will be looking for

- Understanding of the reading (as shown through a reflection on a relevant selection of theories, concepts, and research findings)
- A critical perspective of the theory/empirical research
- And as the semester progresses, I expect to see you tie the new concepts and ideas into those already discussed

### *Discussion leader*

Every student will be asked to lead the class discussion at least once this semester, possibly together with one (or more) other student(s), depending on class enrollment. The discussion leader is expected to:

- Meet with the instructor prior to the class (at least 24 hours prior to the class which the student leads) to discuss their ideas for the class;

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- Submitting an extended response paper that will include: 1. A normal response paper, 2. A set of discussion questions, 3. A set of key ideas that the class will explore, 4. Supplemental materials to augment the discussion (e.g., YouTube videos, news clips), 5. A bibliography that will include additional readings. This is due Tuesday, 9am;
- Starting the class in discussion by providing a brief overview of that week's readings, to include the theoretical concepts and the empirical research, and presenting any supplemental materials;
- Leading the class in a discussion of that week's topic.

### *Final project*

The goal of the final project is for you to use the course content to further your own research agenda. For the final project, you can choose from the following options:

1. Research paper  
If you select this option, you will conduct original research on a set of publicly available social media posts using either qualitative or quantitative analysis. This paper will consist of a clear introduction, outlining your topic and its relevance, a discussion of related literature, one or more research questions, a methods section, and then your findings as well as a conclusion. You must receive clearance from the instructor regarding your topic and chosen methodology. The paper should be written so that it could be submitted for publication and/or a conference presentation
2. Theoretical paper  
This option involves writing a paper that contributes new knowledge to the field by exploring a specific theme or concept, connecting concepts discussed in class to ideas and theories from other areas, and/or critically surveying a specific area. This is an opportunity for you to connect the ideas presented in the class to your own research interests. The paper should be written so that it could be submitted for publication and/or a conference presentation.

Both options need to meet the following criteria:

- 4,000-5,000-word count, double-spaced, Times New Roman, 12-point font
- Adheres to APA standards
- In a .doc format (or its equivalent)
- Emailed to me by the deadline Friday December 8 at noon.

Prospectus: This is a short paper (3-4 pages) that describes your plans for your final project. You have to provide a preliminary literature review, bibliography, and a general overview of the outline of your paper. **Due Friday November 8 at noon**

Final presentation: You will present your final project in a conference-style presentation in the last two weeks of class. This means you have to prepare a ten-minute presentation and be ready for about 5 minutes of Q & A. **Due: Weeks 14 and 15**

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Final project: **Due Friday December 6 at noon**



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*Course schedule*

Below is a tentative schedule for the semester. It is your responsibility to keep up with any changes, which may be announced in class or posted on BrightSpace. Readings will be available on BrightSpace and via the class Google Drive.

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.

<b>Week 1: Web 2.0 and participatory cultures</b>
<b><i>Required reading</i></b>
Song, F.W. (2010). Theorizing Web 2.0. <i>Information, Communication, &amp; Society</i> , 13(2), 249-275.
Barassi, V., & Treré, E. (2012). Does Web 3.0 come after Web 2.0? Deconstructing theoretical assumptions through practice. <i>New Media &amp; Society</i> , 14(8), 1269-1285.
Arora, P. (2012). Typology of Web 2.0 spaces: Understanding the cultural dimensions of social media spaces. <i>Current Sociology</i> , 60(5), 599-618. doi: 10.1177/0011392112440439
Jenkins, H. (2006). <i>Convergence culture: Where old and new media collide</i> . New York: New York University Press. (pp. 131-139 – remained of the chapter is suggested reading).
Deuze, M. (2006). Participation, remediation, bricolage: Considering principal components of digital culture. <i>The Information Society</i> , 22, 63-75. doi: 10.1080/01972240600567170
<b><i>Recommended reading</i></b>
Howard, R.G. (2008). The vernacular web of participatory media. <i>Critical Studies in Media Communication</i> , 25(5), 490-513.
Bird, S.E. (2011). Are we all producers now? Convergence and media audience practices. <i>Cultural Studies</i> : 25(4-5), 502-516.
Jarrett, K. (2008). Interactivity is evil! A critical investigation of Web 2.0. <i>First Monday</i> , 13(3). Retrieved from <a href="http://firstmonday.org/ojs/index.php/fm/article/view/2140/1947">http://firstmonday.org/ojs/index.php/fm/article/view/2140/1947</a>
Jenkins, H. (2014). Rethinking “rethinking convergence/culture”. <i>Cultural Studies</i> , 28(2), 267-297.
<b>Week 2: Autonomy on social media: Privacy, agency, and affordances</b>
<b><i>Required reading</i></b>
Andrejevic, M. (2002). The work of being watched: Interactive media and the exploitation of self-disclosure. <i>Critical Studies in Media Communication</i> , 19(2), 230-248.

Marwick, A., & boyd, d. (2014). Networked privacy: How teenagers negotiate context in social media. *New Media & Society*, 16(7), 1051-1067.

Van Dijck, J. (2009). Users like you? Theorizing agency in user-generated content. *Media, Culture, & Society*, 31(1), 41-48.

Weber, R. (2013). Constrained agency in corporate social media policy. *Journal of Technical Writing and Communication*, 43(3), 289-315.

Comunello, F., Mulargia, S., & Parisi, L. (2016). The “proper” way to spread ideas through social media: Exploring the affordances and constraints of different social media platforms as perceived by Italian activists. *The Sociological Review*, 64, 515-532.

#### *Recommended reading*

Trepte, S. (2015). Social media, privacy, and self-disclosure: The turbulence caused by social media’s affordances. *Social Media + Society*, April-June 2015, 1-2.

Hanckel, B., Vivienne, S., Byron, P., Robards, B., & Churchill, B. (2019). “That’s not necessarily for them”: LGBTIQ+ young people, social media platform affordances, and identity curation. *Media, Culture, & Society*, Online preprint.

Pearce, K., & Vitak, J. (2016). Performing honor online: The affordances of social media for surveillance and impression management in an honor culture. *New Media & Society*, 18(11), 2595-2612.

*In-class activity: Using the thinking aloud technique*

### **Week 3: How do people connect: Networked (counter)publics**

#### *Required reading*

Parks, M. R. (2011). Social networking sites as virtual communities. In Z. Papacharissi (Ed.), *A networked self: Identity, community, and culture on social network sites* (pp. 105-123). New York: Routledge (Read pp. 105-111).

Van Dijck, J. (2012). Facebook and the engineering of connectivity: A multi-layered approach to social media platforms. *Convergence: The International Journal of Research into New Media Technologies*, 19(2), 141-155.

Ellison, N., B., Lampe, C., Steinfield, C., & Vitak, J. (2011). With a Little Help From My Friends: How Social Network Sites Affect Social Capital Processes. In Z. Papacharissi (Ed.), *A networked self: Identity, community, and culture on social network sites* (pp. 124-145). New York: Routledge

boyd, d. (2011). Social networking sites as networked publics. In Z. Papacharissi (Ed.), *A networked self: Identity, community, and culture on social network sites* (pp. 39-58). New

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York: Routledge.

Fraser, N. (1992). Rethinking the public sphere: A contribution to the critique of actually existing democracy. In C. Calhoun (Ed.), *Habermas and the public sphere* (pp. 109-142). Cambridge, MA: MIT Press. (pp. 109-132).

***Recommended Reading***

Jackson, S.J., & Foucault Welles, B. (2015). Hijacking #MyNYPD: Social media dissent and networked counterpublics. *Journal of Communication*, 65, 932-952.

Kuo, R. (2018). Racial justice activist hashtags: Counterpublics and discourse circulation. *New Media & Society*, 20(2), 495-515.

Chan, M. (2018). Networked counterpublics and discursive contestation in the agonistic public sphere: Political jamming a police force Facebook page. *Asian Journal of Communication*, 28(6), 561-578.

**Week 4: Identity, authenticity, and well-being**

***Required reading***

Howard, J.A. (2000). Social psychology of identities. *Annual Sociological Review*, 26, 367-393 (pp. 367-374 only)

Hogan, B. (2010). The presentation of the self in the age of social media: Distinguishing performances and exhibitions online. *Bulletin of Science, Technology, and Society*, 30(6), 377-386.

Marwick, A., & boyd, d., (2011). I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. *New Media & Society*, 13(1), 114-133.

Friedman, M. (2018). Insta-judgment: Irony, authenticity and life-writing in mothers' use of Instagram. *Interactions: Studies in Communication & Culture*, 9(2), 169-181.

Reer, F., Tang, W.Y., & Quandt, T. (2019). Psychological well-being and social media engagement: The mediating roles of social comparison orientation and fear of missing out. *New Media & Society*, 21(7), 1486-1505.

***Recommended reading***

Salisbury, M., & Pooley, J.D. (2017). The #nofilter self: The contest for authenticity among social networking sites, 2002-2016. *Social Sciences*, 6(10), 1-24.

Liu, Y., Rui, J.R., & Cui, X. (2017). Are people willing to share their political opinions on Facebook? Exploring roles of self-presentational concern in spiral of silence. *Computers in Human Behavior*, 76, 294-302.

Chen, H.-T., & Li, X. (2017). The contribution of mobile social media to social capital and psychological well-being: Examining the role of communicative use, friending, and self-

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disclosure. *Computers in Human Behavior*, 75, 958-965.

Page, R. (2012). The linguistics of self-branding and micro-celebrity in Twitter: The role of hashtags. *Discourse & Communication*, 6(2), 181-201.

*In-class activity: Analyzing visual images*

### **Week 5: Social media and democracy: The virtual public sphere**

#### ***Required reading***

Habermas, J., Lennox, S., & Lennox, F. (1974). The public sphere: An encyclopedia article (1964). *New German Critique*, 3, 49-55.

Mouffe, C. (1999). Deliberative democracy or agonistic pluralism? *Social Research*, 66(3), 745-758.

Dahlgren, L. (2001). Computer-mediated communication and the public sphere: A critical analysis. *Journal of Computer-Mediated Communication*, 7(1), 0

Bennett, W.L. (2012). The personalization of politics: Political identity, social media, and changing patterns of participation. *American Academy of Political and Social Science*, 644, 20-39.

Kruse, L.M., Norris, D.R., & Flinchum, J.R. (2018). Social media as a public sphere? Politics on social media. *The Sociological Quarterly*, 59(1), 62-84.

Fenton, N. (2011). Alternative Media and Social Networking Sites: The Politics of Individuation and Political Participation. *The Communication Review*, 14(3), 179-196.

#### ***Recommended reading***

Paparachissi, Z. (2009). The virtual sphere 2.0: The internet, the public sphere, and beyond. In A. Chadwick & P.N. Howard (Eds.), *Routledge Handbook of Internet Politics* (pp. 230-245). New York: Routledge.

Castells, M. (2007). Communication, power, and counterpower in the network society. *International Journal of Communication*, 1, 238-266.

Gross, J. H., & Johnson, K.T. (2016). Twitter taunts and tirades: Negative campaigning in the age of Trump. *PS: Political Science and Politics*, 49(4), 748-754.

Halpern, D., & Gibbs, J. (2013). Social media as catalyst for online deliberation. Exploring the affordances of Facebook and YouTube for political expression. *Computers in Human Behavior*, 29, 1159-1168.

Colleoni, E., Rozza, A., & Arvidsson, A. (2014). Echo chamber or public sphere? Predicting political orientation and measuring political homophily in Twitter using big data. *Journal of*

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*Communication*, 64, 317-332.

**Week 6: Trolls, fake news and the alt-right: The tragic flaw of social media?**

***Required reading***

McCosker, A. (2014). Trolling as provocation: YouTube's antagonistic politics. *Convergence: The International Journal of Research into New Media Technologies*, 20(2), 201-217.

Nikitina, S. (2012). Hacksters as tricksters of the digital age: Creativity in hacker culture. *The Journal of Popular Culture*, 45(1), 133-152.

Heikkila, N. (2017). Online antagonism of the alt-right in the 2016 election. *European Journal of American Studies*, 12(2), 1-22.

Persily, N. (2017). Can democracy survive the internet? *Journal of Democracy*, 28(2), 63-76.

Milhailidis P., & Viotty, S. (2017). Spreadable spectacle in digital culture: Civic expression, fake news, and the role of media literacies in "post-fact" society. *American Behavioral Scientist*, 61(4), 441-454.

***Recommended reading***

Burroughs, B. (2013). Obama trolling: Memes, salutes, and agonistic politics in the 2012 presidential election. *The Fibreculture Journal*, 22. Retrieved from <http://twentytwo.fibreculturejournal.org/fcj-165-obama-trolling-memes-salutes-and-an-agonistic-politics-in-the-2012-presidential-election/>

Lamerichs, N., Nguyen, D., Peurta Melguizo M.C., Radojevic, R., & Lange-Böhmer, A (2018). Elite male bodies: The circulation of alt-right memes and the framing of politicians on social media. *Participations: Journal of Audience and Reception Studies*, 15(1), 180-206.

Zimmer, F., Scheibe, K., Stock, M., & Stock, W.G. (2019). Fake news in social media: Bad algorithms or biased users? *Journal of Information Science Theory and Practice*, 7(2), 40-53.

Talwar, S., Dhir, A., Kaur, P., Zafar, N., & Alrasheedy, M. (2019). Why do people share fake news? Associations between the dark side of social media use and fake news sharing behavior. *Journal of Retailing and Consumer Services*, 51, 72-82.

**Week 7: Hear me roar: Marginalized voices and social media**

***Required reading***

Florini, S. (2014). Tweets, tweeps and signifyin': Communication and cultural performance on "Black Twitter". *Television & New Media*, 15(3), 223-237.

Right-McDaniels, J.L., & Hendrickson, E.M. (2014). Hoes and hashtags: Constructions of gender and race in trending topics. *Social Semiotics*, 24(2), 175-190.

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Kim, L. & Johnson, B. (2018). Contesting race in YouTube's *K-Town*: "It's white people in Asian disguises". *Journal of Social Media in Society*, 7(1), 78-105.

Maragh, R. S. (2016). "Our struggles are unequal": Black women's affective labor between television and Twitter. *Journal of Communication Inquiry*, 40(4), 351-369.

Cisneros, J.D., & Nakayam, T. K. (2015). New Media, old racisms: Twitter, Miss America, and cultural logics of race. *Journal of International and Intercultural Communication*, 8(2), 108-127.

#### ***Recommended reading***

Maragh, S. (2018). Authenticity on "Black Twitter": Reading racial performance and social networking. *Television & New Media*, 19(7), 591-609.

Balance, C.B.B. (2012). How it feels to be viral me: Affective labor and Asian American YouTube performance. *Women Studies Quarterly*, 40(1&2), 138-152.

Vivienne, S. (2017). "I will not hate myself because you cannot accept me": Problematizing empowerment and gender-diverse selfies. *Popular Communication*, 15(2), 126-140.

*In class activity: Grounded theory and social media data*

#### **Week 8: Who tells your story: Activism and Social Media**

#### ***Required reading***

Morozov, E. (2009, May 19). *The brave new world of slacktivism*. Retrieved from [http://neteffect.foreignpolicy.com/posts/2009/05/19/the\\_brave\\_new\\_world\\_of\\_slacktivism](http://neteffect.foreignpolicy.com/posts/2009/05/19/the_brave_new_world_of_slacktivism)

Shirky, C. (2011). The political power of social media. Technology, the public sphere and political change. *Foreign Affairs*. Retrieved from <https://www.foreignaffairs.com/articles/2010-12-20/political-power-social-media>

Ganesh, S., & Zoller, H.M. (2012). Dialogue, activism, and democratic social change. *Communication Theory*, 22(1), 66-91.

Juris, J.S. (2012). Reflections on #Occupy everywhere. Social media, public space, and emerging logics of aggregation. *American Ethnologist*, 39(2), 259-279

Brunner, E. (2017). Wild public networks and affective movements in China: Environmental activism, social media, and protest in Maoming. *Journal of Communication*, 67, 665-677.

#### ***Recommended reading***

Solow-Niederman, A.G. (2010). The power of 140 characters? #IranElection and social movements in Web 2.0. *Intersect*, 3(1), 30-39.

Howard, P.N., & Hussain, M.H. (2011). The upheavals in Egypt and Tunisia: The role of the digital media. *Journal of Democracy*, 22(3), 35-48.

Carney, N. (2016). All lives matter but so does race: Black lives matter and the evolving role of social media. *Humanity & Society*, 40(2), 180-199.

Xion, Y., Cho, M., & Boatwright, B. (2019). Hashtag activism and message frames among social movement organizations: Semantic network analysis and thematic analysis of Twitter during the #MeToo movement. *Public Relations Review*, 45, 10-23.

### **Week 9: Social media use in practice: The digital divide**

#### ***Required reading***

Büchi, M., Just, N., & Latzer, M. (2016). Modeling the second-level digital divide: A five-country study of social differences in internet use. *New Media & Society*, 18(11), 2703-2722.

Srinivasan, R. (2012). Rethinking digital cultures and divides: The case for reflective media. *The Information Society*, 28, 24-36.

Schradie, J. (2011). The digital production gap: The digital divide and web 2.0 collide. *Poetics*, 39, 145-168

#### ***Recommended reading***

Van Deursen, A.J.A.M., & van Dijk, J.A.G.M. (2014). The digital divide shifts to differences in usage. *New Media & Society*, 16(3), 507-526.

Wei, L., & Blanks Hindman, D. (2011). Does the digital divide matter more? Comparing the effects of new media and old media use on the education-based knowledge gap. *Mass Communication and Society*, 14, 216-235.

*In-class activity: Learning how to collect social media data*

### **Week 10: Risk and crisis communication**

#### ***Required reading***

Neely, L. (2013). Risk communication in social media. In J. Arvai & L. Rivers III (Eds.), *Effective Risk Communication* (pp. 143-164). Taylor & Francis.

Rains, S.A., Brunner, S.R., & Oman, K. (2015). Social media and risk communication. In H. Cho, T. Reimer, & McComas, K.A. (Eds.), *The Sage Handbook of Risk Communication* (pp. 228-241). Sage.

Vafeiadis, M., Bortree, D.S., Buckley, C., Diddi, P., & Xiao, A. (2019). Refuting fake news on social media: Nonprofits, crisis response strategies, and issue involvement. *Journal of Product and Brand management*, Online pre-print.

Kasperson, R.E., Renn, O., Slovic, P., Brown, H.S., Emel, J., Goble, R., Kasperson, J.X.,

Ratick, S. (1988). The social amplification of risk: A conceptual framework. *Risk Analysis*, 8(2), 177-187.

Vijaykumar, S., Jin, Y., & Nowak, G. (2015). Social media and the virality of risk: The Risk Amplification through Media Spread (RAMS) model. *Homeland Security & Emergency Management*, 12(3), 653-677.

### ***Recommended reading***

Veil, S.R., Buehner, T., & Palenchar, M.J. (2011). A work-in-process literature review: Incorporating social media in2 and crisis communication. *Journal of Contingencies and Crisis Management*, 19(2), 110-122.

Fellenor, J., Barnett, J., Potter, C., Urquhart, J., Mumford, J.D., & Quine, C.P. (2018). The social amplification of risk on Twitter: The case of ash dieback disease in the United Kingdom. *Journal of Risk Research*, 21(10), 1163-1183.

Flaherty, G.T. (2019). Taking the edge out of high-risk selfies in adventure tourists. *Wilderness & Environmental Medicine*, 30(2), 218-220.

Metzner-Szigeth, A. (2009). Contradictory approaches? On realism and constructivism in the social sciences research on risk, technology, and the environment. *Futures*, 41, 156-169.

Rickard, L., McComas, K., & Newman, S. (2011). Visitor proficiency profiling and risk communication at a national park. *Environmental Communication*, 5(1), 62-82.

Strekalova, Y.A., & Krieger, J.L. (2017). Beyond words: Amplification of cancer risk communication on social media. *Journal of Health Communication*, 22(10), 849-857.

Rickard, L. N. (2014). Perception of risk and the attribution of responsibility for accidents. *Risk Analysis*, 34(3), 514-528

*In-class activity: Risk communication and selfies*

### **Week 11: Controlling the narrative: Corporate influence on digital cultures**

#### ***Required reading***

Dahlberg, L. (2005). The Corporate Colonization of Online Attention and the Marginalization of Critical Communication? *Journal of Communication Inquiry*, 29(2), 160-180.

Ritzer, G., & Jurgensen, N. (2010). Production, Consumption, Prosumption. *Journal of Consumer Culture*, 10(1), 13-36.

Deuze, M. (2008). Corporate Appropriation of Participatory Culture. In N. Carpentier, & S. Livingstone (Eds.), *Participation and Media Production: Critical Reflections on Content Creation* (pp.27-40). Newcastle upon Tyne: Cambridge Scholars.



CMJ 540 – Fall 2021

Gil de Zúñiga, H., Copeland, L., & Bimber, B. (2013). Political consumerism: Civic engagement and the social media connection. *New Media & Society*, 16(3), 488-506.

Logan, N. (2016). The Starbucks Race Together initiative: Analyzing a public relations campaign with critical race theory. *Public Relations Inquiry*, 5(1), 93-113.

***Recommended reading***

Abidin, C. (2016). Visibility Labour: Engaging with influencers' fashion brands and OOTD advertorial campaigns on Instagram. *Media International Australia*, 16(1), 86-100.

Rokka, J., & Canniford, R. (2016). Heterotopian selfies: How social media destabilizes brand assemblages. *European Journal of Marketing*, 50(9/10), 1789-1813.

**Week 12: Reflecting on Popular Culture: Cultural citizenship**

***Required reading***

Burgess, J., Foth, M., & Klæbe, H. (2006). *Everyday creativity as civic engagement: A cultural citizenship view of new media*. Paper presented at the Communication Policy & Research Forum, September 25-26, Sydney, Australia.

McGuian, J. (2005) The cultural public sphere. *European Journal of Cultural Studies*, 8(4) 427-443.

Selva, D. (2016). Social television: Audience and political engagement. *Television & New Media*, 17(2), 159-173.

Shifman, L. (2011). An anatomy of a YouTube meme. *New Media & Society*, 14(2), 187-203.

Xu, W.W., Park, J.Y., Kim, J.Y., & Park, H.W. (2016) Networked cultural diffusion and creation on YouTube: An analysis of YouTube memes. *Journal of Broadcasting & Electronic Media*, 60(1), 104-122.

***Recommended reading***

Burgess, S. (2011). YouTube on masculinity and the founding fathers: Constitutionalism 2.0. *Political Research Quarterly*, 64(1), 120-131.

Highfield, T. (2016). News via Voldemort: Parody accounts in topical discussions on Twitter. *New Media & Society*, 18(9), 2028-2045.

Williams, A. & Gonlin, V. (2017) I got all my sisters with me (on Black Twitter): second screening of *How to Get Away with Murder* as a discourse on Black Womanhood. *Information, Communication & Society*, 20(7), 984-1004.

*Assignments:* Prospectus due Friday November 8, 12noon

CMJ 540 – Fall 2021

<b>Week 13: Thanksgiving break: No class</b>
<b>Week 14: Final presentations</b>
<b>Week 15: Final presentations</b>
<i>Assignments:</i> Final paper due Friday December 6, 12noon



**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 Electrical and Computer Engineering

COURSE DESIGNATOR ECE COURSE NUMBER 591 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Deep Learning

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)**

*David J. Neivandt*

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

**Mohamad Musavi**

Digitally signed by Mohamad Musavi  
DN: cn=Mohamad Musavi, o=University of Maine,  
ou=College of Engineering, email=musavi@maine.edu, c=US  
Date: 2021.03.26 21:30:35 -04'00'

**College Dean(s)**

*Pana L. Humphrey*

3/26/21

**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):

ECE 591 Deep Learning This course is an introduction to deep learning, a branch of machine learning concerned with the development and application of deep artificial neural networks. Topics include convolution neural networks, recurrent neural networks, and their applications for various engineering and scientific problems. Students should know at least one high-level programming language. This course will use Python and give tutorials on Python programming. Students will gain hands on experiences of developing, training, and evaluating deep learning models to solve sophisticated problems. Lec 3. (Fall) Prerequisites & notes ECE 177 or COS 220 or CIE 115 or MEE 125 or permission, 3 credits ECE 491 and ECE 591 can not both be taken for credits.

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:

(1) Deep Learning with Python, by Francois Chollet, ISBN 9781617294433.  
<https://www.manning.com/books/deep-learning-with-python>  
(2) Free online book: Ian Goodfellow, Yoshua Bengio, Aaron Courville. Deep Learning.  
<https://www.deeplearningbook.org/>

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

Yifeng Zhu, Professor of Electrical and Computer Engineering, teaching load: 2+2

Reason for new course:

Deep learning is on of the most exciting and promising branch of machine learning. Advances of deep learning are being seen in many challenging areas such as self-driving cars, medical engineering, manufacture, and robotics. Most of ECE undergraduate curricula emphasize on analytical modeling. This course exposes students to empirical modeling, which approximates the input/output behavior of a complex system by learning from experimental or observational data. Such systems are often difficult to model using conventional analytical methods. In addition, the industry has a rapidly increasing demand for engineers with AI skills. This course will provide students with significant experiences of using modern deep learning frameworks, such as TensorFlow and Keras, to solve real-world complex problems. This course has been offered twice as ECE 498/598 and has gained significant interests, with 22 students registered in Fall 2019 and 25 registered in Fall 202. A total of 12 students form majors rather than ECE and Computer Science have successfully completed this course. Students' course evaluation have been excellent. This shows that weak programming skills is not a significant obstacle in this course.

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.

NO

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 fall semester.

## ECE 491/591 Deep Learning

**Course Catalog Description:** This course is an introduction to deep learning, a branch of machine learning concerned with the development and application of deep artificial neural networks. Topics include convolution neural networks, recurrent neural networks, and their applications for various engineering and scientific problems. Students should know at least one high-level programming language. This course will use Python and give tutorials on Python programming. Students will gain hands-on experiences of developing, training, and evaluating deep learning models to solve sophisticated problems.

**Credit Hours:** 3

**Prerequisites:** ECE 177 or COS 220 or CIE 115 or MEE 125 or permission

**Instructor:**

Instructor: Yifeng Zhu  
Office Hours: TBD  
Office: 271 Barrows Hall  
Phone: 581-2499  
Email: [Yifeng.Zhu@maine.edu](mailto:Yifeng.Zhu@maine.edu)  
u

**Course Delivery Method:**

Online, synchronous. Lectures are recorded and can be reviewed asynchronously.

**Hardware:**

Students are expected to work on their own computer / laptop. Student will explore free Google Colab for homework and projects. Additional computing support will be provided by the University of Maine Systems (UMS) Advanced Computing Group if necessary.

**Textbook (Required):**

- Deep Learning with Python, by François Chollet, ISBN 9781617294433. UMaine Fogler Library has purchased the eBook and you can obtain it here:  
<https://ursus.maine.edu/record=b6755064~S1>
- Free online book: Ian Goodfellow, Yoshua Bengio, Aaron Courville. Deep Learning.  
<https://www.deeplearningbook.org/>

**Course Goals:**

The objective of this course is to learn about modern deep learning techniques and their applications.

**Instructional Objectives:**

Students are encouraged to attend all lectures and participate in group discussions. All lectures will be recorded, and students can watch them at their own schedule. Students are required to complete all quizzes, homework assignments, and a term project that they present to the rest of the class. Quizzes and homework assignments are often given days ahead of the due date. The project should be presented in a recorded video and share with the class. A project Q&A session will be organized at the end of the semester.

#### **Student Outcomes:**

Following the latest **ABET criteria for accrediting engineering programs**, this course provides documented performance indicators to evaluate the following four student outcomes:

- **Outcome 1:** *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*

##### **Performance indicators:**

- Identify whether the problem solution, either classification or regression, is appropriate and within reasonable constraints.
- Formulate appropriately the inputs and outputs of a supervised-learning model.
- Choose appropriate mathematical metrics and experimental methods to evaluate and analyze the model for required accuracy and generalization.

- **Outcome 2:** *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*

##### **Performance indicators:**

- Identify the societal and economic impacts of false positives and false negatives made by a classifier for medical applications.
- Based on consideration of societal impacts, choose appropriate evaluation metrics, such as accuracy, precision, or sensitivity.

- **Outcome 3:** *an ability to communicate effectively with a range of audiences*

##### **Performance indicators:**

- Term project written report conforms appropriate technical style.
- Appropriate use of graphics to show design schemes and plot experimental data.
- Well organized oral presentation structure, with clear beginnings, middles and ends.
- Appropriate use of visual aids such as presentation slides, demos, handouts, or video clips

- **Outcome 6:** *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*

##### **Performance indicators:**

- Determine whether the model overfits and underfits based on the training and validation errors reported by the model.

- Choose appropriate techniques to mitigate overfitting or underfitting based on the analysis of the results of training, validation and testing.
- Calculate the number of learnable parameters in a CNN model, and evaluate the computation and memory complexity.

**Tentative Course Schedule (subject to change):**

Topics	Time Spent
Introduction to Python <ul style="list-style-type: none"> <li>• Data types</li> <li>• Container: lists (slicing, iterating, copying), dictionary, sets, tuples</li> <li>• Iterators, zip</li> <li>• Yield vs return</li> <li>• Functions, class, modules, packages</li> <li>• NumPy: arrays, array indexing, concatenation &amp; splitting, statistical functions, sort &amp; search, basic linear algebra operations, broadcasting</li> <li>• <b>Homework #1:</b> Python programming</li> <li>• <b>Homework #2:</b> NumPy programming</li> </ul>	2 Weeks
Convolutional Neural Network (CNN) <ul style="list-style-type: none"> <li>• Neural networks, classification, regression</li> <li>• CNN layers: convolution, activation functions, pooling, flatten, FC, dropout, softmax</li> <li>• <b>Homework #3:</b> Building simple CNN models in Keras</li> </ul>	3 weeks
Modern CNN <ul style="list-style-type: none"> <li>• Gradient vanishing and explosion</li> <li>• AlexNet, VGG, ResNet, GoogleNet</li> <li>• <b>Homework #4:</b> Transfer learning for image classification</li> </ul>	2 weeks
Training and Metrics <ul style="list-style-type: none"> <li>• Loss, cross entropy loss, KL divergence</li> <li>• Gradient descent</li> <li>• Precision, sensitivity, specificity, ROC, AUC</li> </ul>	2 weeks
Overfitting and underfitting <ul style="list-style-type: none"> <li>• Data augmentation</li> <li>• Regularized loss minimization (L1 and L2)</li> <li>• Drop out</li> <li>• Dynamic learning rate scheduling</li> <li>• <b>Homework 5:</b> Fighting overfitting</li> </ul>	1 week
Image Applications <ul style="list-style-type: none"> <li>• Image classification</li> <li>• Semantic segmentation and object detection</li> <li>• Up sampling, transposed convolution</li> <li>• <b>Homework 6:</b> Image segmentation</li> </ul>	2.5 weeks
RNN and LSTM <ul style="list-style-type: none"> <li>• Stacked LSTM</li> <li>• CNN + LSTM</li> <li>• <b>Homework 7:</b> Analyzing time-series data</li> </ul>	2.5 weeks

**Course Grading**

ECE 491		ECE 591	
Quiz	10%	Quiz	10%
Mid-term	15%	Mid-term	15%
Programming assignments	30%	Programming assignments	30%
Project	45%	Project	30%
		Paper review and presentation	15%

- Each quiz is given off-line and students have multiple days to complete it.
- Once solutions are published, late work cannot be accepted for credit.

**Course Project:**

The focus of this course project falls into one of these two categories:

- **Applications.** Apply deep learning models to solve a real-world task that interests you.
- **Models.** Build a new model or a new variant of existing models to tackle a pre-defined task. Usually, we deploy datasets commonly used in published papers, such as ImageNet, to make comparison with other published models.

In this project, you can work in teams of up to 3 persons. The project includes: (1) a project proposal limited to 500 words, which includes the project motivation, planned methods, and key milestones, (2) a pre-recorded project presentation, and (3) the final project report (limited to 5 pages).

Requirement		Points
Design & Implementation	Difficulty level of the problem	15
	Design of deep neural network	15
	Evaluation of deep neural network	20
	Code documentation	15
Report	Organization and logic: abstract, introduction, related work, design, evaluation and discussion, conclusion, and reference	10
	Clarity and critical thinking	10
Presentation	Appropriate use of technology during presentation (where relevant). Presentation of thesis/project work is clear and well-organized. Responds to questions in poised, articulate, and professional manner.	15
Total		100

**Software/Hardware:** Programming assignments and projects will be developed in the Python programming language. We will also use the Tensorflow deep learning library for some homeworks and for the project. Students are expected to use free Google CoLab and the Advanced Computing Group (AGC) if necessary.

**Academic Honesty Statement:**

<https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Academic>

**Students Accessibility Services Statement:**



<https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Accessibility>

**Course Schedule Disclaimer:**

<https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Schedule>

**Observance of Religious Holidays/Events:**

<https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Observance>

**Sexual Discrimination Reporting:**

[https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Reporting\\_Long](https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Reporting_Long)



**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 graduate@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

GRADUATE PROGRAM/UNIT Electrical Engineering Technology

COURSE DESIGNATOR EET COURSE NUMBER 514 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Printed Circuit Board Design

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)



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

**Mohamad Musavi** Digitally signed by Mohamad Musavi  
Date: 2021.02.14 14:34:02 -05'00'

College Dean(s)

**Dana N Humphrey** Digitally signed by Dana N Humphrey  
Date: 2021.03.26 17:51:45 -04'00'

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):

EET 514 Printed Circuit Board Design  
Prerequisite: EET 241 or EET 330 or ECE 203 or ECE 210, Graduate standing or Instructor permission.  
Credit hours: 3  
Description: This online course will focus on printed circuit boards (PCB) technology, layout, and construction. Emphasis is placed on troubleshooting PCBs and the physical realization of electronic circuits. Background topics include PCB manufacturing and assembly (focusing on cutting-edge manufacturing capabilities and designing for pick-and-place auto-assembly). Emphasis will also be placed on schematic capture and circuit board layout and advanced layout techniques using Altium Designer (including 3-D layer design, 3-D PCB design, flex-PCB design, and PCB materialization techniques). Students will be required to use Altium Designer to design and layout their own custom circuit board as a final project. There is no textbook and the software is free for University students. This course is offered fall and spring semesters. EET 414 and EET 514 can and both be taken for credit.

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

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

None

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

John Allen, Associate Professor (in EET), full-time teaching load

Reason for new course:

The proposed course will be cross-listed with the undergraduate course EET 415. There will be additional assignments justifying the graduate component (see the syllabus). This graduate course will be used to support an upcoming graduate certificate in EET as well as a possible graduate program in EET.

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.

No other departments will be affected. This has overlap with the undergraduate version of the course (EET 414). These two courses will be cross-listed with additional research components for the graduate version of the course.

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

EET 414 is taught every fall and spring and is supported (financially) by DLL. The proposed graduate course will be taught simultaneous with EET 414 (cross-listed). Continued DLL support is requested for this new graduate course.

University of Maine  
School of Engineering Technology  
EET 414/514: Printed Circuit Board Design  
Spring 2021

## Course Syllabus

### Catalog Description

This online course will focus on printed circuit board (PCB) technology, layout, and construction. Emphasis is placed on troubleshooting PCBs and the physical realization of electronic circuits. Background topics include PCB manufacturing and assembly (focusing on cutting-edge manufacturing capabilities and designing for pick-and-place auto assembly). Emphasis will also be placed on schematic capture and circuit board layout and advanced layout techniques using Altium Designer (including 8-10 layer design, 3-D PCB design, flex-PCB design, and PCB miniaturization techniques). Students will be required to use Altium Designer to design and layout their own custom circuit board as a final project. There is no textbook and the software is free for University students. This course is offered fall and spring semesters.

Prerequisite: EET 241 or EET 330 or ECE 209 or ECE 210, or instructor permission.

Credits: 3

### Course Information

This course will provide students with an introduction to printed circuit board (PCB) technology, layout, and construction. The course will be broken up into three sections: 1) PCB technology and theory, 2) PCB design and layout, and 3) PCB manufacturing and fabrication.

PCB technology will be discussed in a traditional lecture setting (via Zoom).

PCB layout will be introduced using Altium Designer. During this portion of the course, students will be required to use their laptops (with Altium installed) to class. We will be performing in-class examples as a method of teaching this software.

PCB manufacturing and assembly will also be discussed in detail.

### Student Learning Outcomes

Upon completion of this course, student will have the following skills:

1. Demonstrate an understanding of the theory behind PCB design, manufacturing, and assembly by achieving proficient score on exam 1 (> 70%).
2. Demonstrate proficiency in PCB design by:
  - a. (a) Proficient (> 70%) use of Altium Designer for schematic capture on in-class project 1
  - b. (b) Completing a PCB design and layout at a proficient level (> 70%) on in-class project 3
  - c. (c) Accurately generate (> 70%) output files on in-class project 4
3. Design and layout a two-layer PCB (from start to finish) at a proficient level (> 70%) on the final project.

### Faculty Information

Taught By:	Prof. John W. Allen, P.E.
E-mail:	<a href="mailto:john.w.allen@maine.edu">john.w.allen@maine.edu</a>
Campus Address:	11 Barrows Hall
Office Phone:	(207) 581-4991
Cell Phone:	(207) 944-7254 (you can call or text me anytime)
Office Hours:	By appointment (and via Zoom)

## Instructional Materials and Methods

Textbook:	None required
Other:	Laptop and Altium Designer software (provided by the University; <b>make sure to download version 15.0.14</b> )
Brightspace:	All course content will be posted on Brightspace. If you have problems accessing the course content on Brightspace, please contact UMaine IT.

## Grading and Course Expectations

### Homework

There will be occasional homework assignments. There will most likely be five to six homework assignments during the semester, and will be project/group-based. More information on these assignments will be discussed during the course.

### Lab Notebooks

Since there is no traditional lab component to this course, a lab notebook is not required. But, it is suggested that a class notebook be kept to help with the take-home and in-class projects. I would suggest printing out class presentations and Altium Designer materials (all to be posted on the class folder).

### Preliminary Exams & Class Projects

There will be one exam in the course (related to PCB theory), several class projects (3-5 projects, related to Altium Designer software), and a final project. The projects will be based on schematic capture, PCB design and layout, and PCB construction and validation. The final project will be to design, layout, and verify an actual PCB (design chosen by each group).

### Expectations for EET514

EET514 is intended for students in the graduate program or desiring to enroll in a graduate program. As a result, additional expectations of work are required to demonstrate successful completion of the EET514 course. Two additional projects are required on top of the normal EET414 expectations. The first project includes schematic capture, component specification, and bill of material development. The second project is a more detailed PCB layout design featuring a flexible PCB. This second project will require you to do some independent research to complete as the flexible PCB material will not be covered in class. These two projects will average into your overall project score for the course. You are required to complete both of these as a minimum to receive a passing grade in EET514.

### Final Project

There is no final exam for this course. But, there is a final project. This project will be a PCB design that will be fully verified (via software) before the end of the semester. The final project will be complete start-to-finish PCB (with all output files ready for manufacture and assembly).

## Course Policies

### Attendance

Attendance is required at all classes as discussions are an essential part of the course.

### Final Grade Equation

The final grade will be computed as follows:

$$\text{Final Grade} = 0.2*(\text{Ex}) + 0.4*(\text{Proj}) + 0.2*(\text{FinPrj}) + 0.2*(\text{HW})$$

Where:

Ex = Exam Score; Proj = Proj Ave; FinPrj = Final Proj; HW = HW Assignments

% to Letter Grade Scale:

≥ 93 = A; 90-92 = A-; 87-89 = B+; 83-86 = B; 80-82 = B-; 77-79 = C+; 73-76 = C; 70-72 = C-;  
67-69 = D+; 63-66 = D; 60-62 = D-; ≤ 59 = F

### Makeup Exam

A makeup exam will be given only with the permission of the instructor and with a valid reason.

### Required Syllabus Statements

Up-to-date language can be seen on the following website:

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

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. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314: <https://www.maine.edu/board-of-trustees/policy-manual/section-314/>

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 (due to COVID-19 or other long-term disruptions), 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.

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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 Title IX Student Services 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:

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University of Maine COVID-19 Syllabus Statement: COVID-19 is an infectious disease caused by the coronavirus SARS-CoV-2. The virus is transmitted person-to-person through respiratory droplets that are expelled when breathing, talking, eating, coughing, or sneezing. Additionally, the virus is stable on surfaces and can be transmitted when someone touches a contaminated surface and transfers the virus to their nose or mouth. When someone becomes infected with COVID-19 they may either have no symptoms or symptoms that range from mild to severe and can even be fatal. During this global pandemic, it is imperative that all students, faculty, and staff abide by the safety protocols and guidelines set forth by the University to ensure the safety of our campus. All students are encouraged to make the Black Bear Cares Pact to protect the health of themselves, the health of others, and the College of Our Hearts Always.

Black Bears Care Pact: <https://umaine.edu/return/black-bears-care/>

Symptom checking: The symptoms of COVID-19 can range from mild to severe, and even people with mild symptoms may transmit the virus to others. Students are encouraged to use the symptom checking app each day before attending class or moving about campus and follow the recommendation prompted within the app. Students should monitor for the following symptoms daily: fever (temperature >100.4F/38.0C) or chills, new cough, loss of taste or smell, shortness of breath/difficult breathing, sore throat, diarrhea, nausea, or vomiting, or the onset of new, otherwise unexplained symptoms such as headache, muscle or body aches, fatigue, or congestion/runny nose.

Physical distancing: Students need to make every effort to maintain physical distancing (6 feet or more) indoors and outdoors including within classrooms. The University classrooms and physical spaces have been arranged to maximize physical distancing. Follow the traffic patterns outlined in each building and outdoor space to avoid crowding. If students are in an academic setting (i.e. clinical or lab class) that requires them to reduce physical distancing, they should follow the instructor's guidelines.

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What to do if you have or suspect you have COVID-19: If you have symptoms of COVID-19 or have been possibly exposed to someone with COVID-19, you should stay home, not interact with others, and contact your health care provider immediately to be tested for COVID-19. You may not attend in-person classes and should suspend interactions with others until you are tested. Prior to receiving test results you should quarantine in your living area according to the Maine CDC guidelines below. Please follow the guidance of your health care professional regarding testing, quarantine, and isolation during the testing process and potential illness period.

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Maine CDC guidelines: <https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/airborne/coronavirus/general-information.shtml>

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COVID-19 Information line: 207.581.2681

Emergency Operations Center Email Contact: [umaine.alerts@umaine.edu](mailto:umaine.alerts@umaine.edu)

**Tentative Course Outline**

This is a tentative course outline. Keep in mind that this is an elective; I will often change the course topics based on student interest.

WEEK #	MATERIAL TO BE COVERED (Videos generally drop Monday nights)			
Week 1	Course Overview, Intro to PCBs (History, Methods, Types, Definitions, Components)	}	PCB Theory	
Week 2	NO CLASS			
Week 3	Intro Continued, Design for Manufacture, Design for Assembly, Schematics & Netlists			
Week 4	Schematics & Netlists Continued, Designing PCBs, Output Files, Board Completion & Inspection, Assembly Drawings, EMC Compliance, Terms & Acronyms			
Week 5	EXAM # 1, Altium Designer: AltiumLive, Design Environment, Design Documents, Project Creation	}	PCB Design & Layout	
Week 6	Schematic Editor Navigation, Placing Schematic Objects, Schematic Connections, Multi-sheet & Hierarchy Design			
Week 7	NO CLASS			
Week 8	Schematic Annotation, Compiling & Verifying Design, Footprint Manager, PCB Editor (Schematic Project # 1)			
Week 9	Defining PCB Board Shape, Design Transfer Schematic to PCB, Working with PCB Panel, Layer Stack Manager & PCB Layers (Schematic Project # 2)			
Week 10	Classes & Rooms, PCB Design Rules, PCB Grids & Guides & Options, PCB Component Placement			
Week 11	PCB Interactive Routing, Polygons, PCB Global Editing, PCB Selection & Find Similar Object (PCB Project # 1)			
Week 12	Schematic Symbol Libraries, PCB Footprint Creation, Component Creation & Integrated Library, Vault Components & Supplier Links, Bill of Materials, Outjobs, Version Control (PCB Project # 2)	}	PCB Manufacturing	
Week 13	Finish PCB layout discussion, flex PCBs, complex multi-layer PCBs (PCB Project # 3)			
Week 14	PCB Milling Machines, Intro to the S63 Milling Machine, S63 Machine Setup			
Week 15	Building PCBs, Populating PCBs, Testing & Validating PCBs, Demonstrating PCBs			
Week 16	NO CLASS - FINAL'S WEEK - Final Projects Due			





**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 Electrical Engineering Technology

COURSE DESIGNATOR EET COURSE NUMBER 515 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Automation and Integration

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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)

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

**Mohamad Musavi** Digitally signed by Mohamad Musavi  
Date: 2021.02.14 14:38:46 -05'00'

College Dean(s)

**Dana N Humphrey** Digitally signed by Dana N Humphrey  
Date: 2021.03.26 17:52:23 -04'00'

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):

EET 515 - Automation and Integration

Prerequisite: Junior standing in the EET major; graduate standing or permission.

Credit hours: 3

Description: Introduction to systems integration will cover many aspects of the integration field that an engineer would expect to encounter. This includes basic networking, hardware types, communication standards and protocols, and troubleshooting skills. This course intends to set the groundwork for a student intending on pursuing a controls or integration engineering expertise, or to give valuable background to a professional who will work closely with these experts. Almost every engineering discipline now works closely with smart devices and automated equipment, so these skills are useful to a wide range of professionals. If this course was taken as a topics course in EET 488, it cannot be repeated for credit. EET 415 and EET 515 can not both be taken for credit.

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

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

Pascal Francis-Mezger, Lecturer (in EET), full-time teaching load

Reason for new course:

The proposed course will be cross-listed with the undergraduate course EET 415. There will be additional assignments justifying the graduate component (see the syllabus). This graduate course will be used to support an upcoming graduate certificate in EET as well as a possible graduate program in EET.

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.

No other departments will be affected. This has overlap with the undergraduate version of the course (EET 415). These two courses will be cross-listed with additional research components for the graduate version of the course.

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?

EET 415 is taught every fall and is supported (financially) by DLL. The proposed graduate course will be taught simultaneous with EET 415 (cross-listed). Continued DLL support is requested for this new graduate course.

## **Fall 2021 EET415/515: Automation and Integration**

### **Course Overview**

Automation and integration will cover many aspects of the integration field that an engineer would expect to encounter. This includes basic networking, hardware types, communication standards and protocols, and troubleshooting skills. This course intends to set the groundwork for a student intending on pursuing a controls or integration engineering expertise, or to give valuable background to a professional who will work closely with these experts. Almost every engineering discipline now works closely with smart devices and automated equipment, so these skills are useful to a wide range of professionals.

Prerequisite: Junior standing in the EET major or permission.

### **Course Access**

The course will be available through Brightspace. All assignments will be assigned and submitted through Brightspace, as well as it being the main access point for class resources and grading.

### **Course Information**

EET415/515: Automation and Integration

3 Credit Hours

Instructor: Pascal Francis-Mezger

pascal.francismezger@maine.edu

The best contact point is through email or office hours, unless the question and answer are relevant to the rest of the class. In this case, please use the comment features on the relevant assignment in Google Classroom.

Office hours: TBD

### **Instructional Materials**

There are no required textbooks. Resources will be added to Brightspace that will be available freely online and address the specifics of the class. Many device and software manuals will be

frequently used and referenced, which will be made available electronically.

## **Student Learning Outcomes**

### **Course Goals**

The goal of this course is to give students a generalized knowledge of what it takes to design, implement, and troubleshoot integration schemes for systems.

### **Instructional Objectives**

By course completion, students should be able to:

- Design, implement, and troubleshoot basic networking setups
- Recognize the benefits and drawbacks of different communication types and media
- Organize data for a multi-device system
- Understand the available hardware for creating, aggregating, and processing data
- Understand the complexity of the ethics and security of large scale communications
- Create graphical user interfaces using proper design schemes
- Understand the data flow for tiered user systems

### **Grading and Course Expectations**

The course will be graded based on attendance, participation in lab, a midterm exam, homework, and a final project or final exam.

Grade Percentages:

10% Attendance

20% Lab Participation

15% Midterm Exam

35% Homework

20% Final Project or Exam

Attendance to class and participation in class "labs" is mandatory. The class is once per week, so missing even a single class misses a huge amount of information. The same is true for being late. Even if an absence is excusable, the "lab" for the class must still be completed, and all "labs" need to be completed to pass the class.

Lab participation is based around engagement with the instructor and other students during the "lab" portion of the class.

Homework assignments will generally have a week for completion. Grades on late homework will be reduced by 20% for each late day.

#### Additional Expectations for EET515

EET515 is intended for students in the graduate program or desiring to enroll in a graduate program. As a result, additional expectations of work are required to demonstrate successful completion of the EET515 course. Two additional projects will be required to be completed above and beyond the expectations of the 415 students. These projects will be researched based and will require students to select and justify real world hardware and software to be utilized for a specific goal. Projects may change each semester and the details will be discussed during the first few weeks of the course. You are required to complete both of these additional projects to receive a passing grade in EET515.

#### **Course Schedule:**

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Week 1:  
Lecture: Networking and Communications overview  
Lab: Terminating Ethernet cable

Week 2:  
Lecture: Physical and Logical Addressing, Networking and Security Ethics  
Lab: Setting up and addressing a local network

Week 3:  
Lecture: TCP/IP and ASCII Communication  
Lab: Serial and TCP/IP communications to SEL relays

Week 4:  
Lecture: ASCII Control and Configuration  
Lab: Configure and control the SEL relays using command line

Week 5:  
Lecture: Modbus Communications  
Lab: Allen Bradley PLC serial communications with Modbus

Week 6:  
Lecture: TCP Packets and Packaging Data  
Lab: Designing data structure for communication interface

Week 7:  
Lecture: SEL Relays and DNP Communication  
Lab: Set up DNP communications to monitor/control SEL relays

Week 8:  
Lecture: Real time Automation Controllers (RTAC) and VPN  
Lab: Set up monitor/control automation in RTAC for SEL Relay

Week 9:  
Lecture: Structuring Data  
Lab: Design/implement data structure for multiple "substations"

Week 10:  
Lecture: HMI Design  
Lab: Week 9 Lab continued

Week 11:  
Lecture: Working with Cimplicity HMI  
Lab: Start Design work of final project

Week 12:  
Lecture: Advanced Topic 1: OPC Communications  
Lab: Cimplicity HMI timing

Week 13:  
Lecture: Advanced Topic 2: Database interaction  
Lab: Cimplicity HMI animation

Week 14:  
Lecture: Advanced Topic 3: Advanced Routing  
Lab: Cimplicity HMI user interaction

Week 15:  
Final Project presentation and review

Final date for all work to be in, unless other arrangements have been made with instructor: 12/18/2021

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Behaviors that can be "sexual discrimination" include sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct, and gender discrimination. Therefore, all of these behaviors must be reported.

Why do teachers have to report sexual discrimination?

The university can better support students in trouble if we know about what is happening. Reporting also helps us to identify patterns that might arise – for example, if more than one victim reports having been assaulted or harassed by the same individual.

What will happen to a student if a teacher reports?

An employee from Title IX Student Services or the Office of Equal Opportunity will reach out to you and offer support, resources, and information. You will be invited to meet with the employee to discuss the situation and the various options available to you.

If you have requested confidentiality, the University will weigh your request that no action be taken against the institution's obligation to provide a safe, nondiscriminatory environment for all students. If the



University determines that it can maintain confidentiality, you must understand that the institution's ability to meaningfully investigate the incident and pursue disciplinary action, if warranted, may be limited. There are times when the University may not be able to honor a request for confidentiality because doing so would pose a risk to its ability to provide a safe, nondiscriminatory environment for everyone. If the University determines that it cannot maintain confidentiality, the University will advise you, prior to starting an investigation and, to the extent possible, will share information only with those responsible for handling the institution's response

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GRADUATE PROGRAM/UNIT Electrical Engineering Technology

COURSE DESIGNATOR EET COURSE NUMBER 560 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Renewable Energy and Electricity Production

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)

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

**Mohamad Musavi** Digitally signed by Mohamad Musavi  
Date: 2021.02.14 15:02:16 -05'00'

College Dean(s)

**Dana N Humphrey** Digitally signed by Dana N Humphrey  
Date: 2021.03.26 17:49:34 -04'00'

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):

EET 560 - Renewable Energy and Electricity Production

Prerequisite: PHY108, PHY112, PHY122; MAT 117 or MAT126, graduate standing or permission. Credit hours: 3

Description: An overview of renewable energy resources, energy conversion and storage for stationary and transportation applications. Topics include: Basics of electrical energy and power generation, load specification, history of electric utilities, distributed generation, the economics of energy, biomass fuels, wind and solar power and fossil fuel limits, and battery storage. Cr.3. EET 460 and EET 560 can not both be taken for credit.

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

- |  |   |  |  |                                 |
|--|---|--|--|---------------------------------|
| <input type="checkbox"/> Applied Music | <input type="checkbox"/> Clinical                   | <input type="checkbox"/> Field Experience/Internship | <input type="checkbox"/> Research          | <input type="checkbox"/> Studio |
| <input type="checkbox"/> Laboratory    | <input checked="" type="checkbox"/> Lecture/Seminar | <input type="checkbox"/> Recitation                  | <input type="checkbox"/> Independent Study | <input type="checkbox"/> Thesis |

Text(s) planned for use:

Renewable and Efficient Electric Power Systems by Gilbert Masters, Second Edition, Wiley, 2013.

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

Paul Villeneuve, Professor (in EET), full-time teaching load  
David Dvorak, Professor (in MET), full-time teaching load

Reason for new course:

The proposed course will be cross-listed with the undergraduate course EET 460. There will be additional assignments justifying the graduate component (see the syllabus). This graduate course will be used to support an upcoming graduate certificate in EET as well as a possible graduate program in EET.

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.

No other departments will be affected. This has overlap with the undergraduate version of the course (EET 460). These two courses will be cross-listed with additional research components for the graduate version of the course.

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?

EET 460 is taught every fall and is supported (financially) by DLL. The proposed graduate course will be taught simultaneous with EET 460 (cross-listed). Continued DLL support is requested for this new graduate course.

**Catalog Description**

An overview of renewable energy resources, energy conversion and storage for stationary and transportation applications. Topics include: Basics of electrical energy and power generation, load specification, history of electric utilities, distributed generation, the economics of energy, biomass fuels, wind and solar power and fossil fuel limits, and battery storage. Cr.3.

Prerequisites: PHY 108 or PHY 112 or PHY 122, and MAT 117 or MAT 126.

**Faculty Information**

Taught By:	Paul Villeneuve	David Dvorak
Phone:	581-2271	581-2338
e-mail:	<a href="mailto:paul.villeneuve@maine.edu">paul.villeneuve@maine.edu</a>	<a href="mailto:dvorak@maine.edu">dvorak@maine.edu</a>
Campus Address:	7 Barrows Hall	TBD
Office Hours:	TBD	TBD

**Course Goals and Objectives**

This course is designed to present the basic science behind the sources of and costs of energy available for human utilization, and provide a bridge between these basic sciences on one hand and engineering practice on the other. The primary focus will be on electricity generation for grid connection, with additional topics on off-grid power production, combined heat and power systems, energy storage, and transportation fuels. The course will guide students through decision-making processes in which basic sciences, engineering, and economics are applied to convert renewable energy resources optimally to meet stated energy needs while understanding that fossil fuels are limited in their supply.

**Learning Outcomes**

By the end of the semester students will be able to:

1. *Describe* how energy sources (renewable and non-renewable) are converted to electricity and interfaced to the grid.
2. *Discuss* regional geographic features which affect the feasibility of utilizing solar, wind, wave, hydro, tidal, and geothermal power.
3. *Describe* the sources and use of biomass as an energy source.
4. *Calculate* the performance of combined heat and power (CHP) systems based on thermodynamic power cycles or fuel cells.
5. *Understand* the challenges of integrating renewable energy technologies with the utility grid.
6. Given a specific situation, *identify* appropriate US Policies on energy sources.
7. *Evaluate and compare* relative costs of renewable energy sources.
8. *Understand* the grid and how it operates.
9. *Explain* how limited fossil fuels will no longer be a cost effective option.

**Instructional Materials and Methods**

Textbook: Renewable and Efficient Electric Power Systems by Gilbert Masters, Second Edition, Wiley, 2013.

Course Management: The course will extensively utilize Blackboard. Ensure that you have access to Blackboard by obtaining a Maine Street ID and password. You can access Blackboard at <https://bb.courses.maine.edu>.

**Course Expectations and Assessment**

Active Learning. Students are expected to stay current with the course progression, viewing the lecture videos within a day or two of the lecture being posted to Blackboard. The lecture videos are supplemented with copies of the presentations and the textbook, all of which should be reviewed before attempting the quizzes.

Homework and Quizzes. Completing the assigned homework and quizzes is probably the best way to prepare for the exams and to meet the Learning Outcomes specified previously. Homework and quizzes will contribute 20% to the overall course grade assigned. There will be no makeup of missed quizzes. Late homework will not be accepted. On-line quizzes will be available for at least one week (7 days). Quizzes will be announced on Blackboard. It is your responsibility to know when the on-line quizzes will be available. Due to the constraints of on-line assessment, any extenuating circumstances must be brought to the instructors' attention before the quiz closes.

Preliminary Exams. Preliminary exams are essential to determine if the Learning Outcomes are being met. There will be three preliminary exams throughout the semester. Each preliminary exam will count for 20% of the overall course grade for a total of 60% for all three exams. There will be no makeup of missed exams without **prior** notification of the instructor (by phone or e-mail). We will give **one** makeup exam toward the end of the semester, covering material from all three prelims. On-line tests will be available for at least two days (48 hours). Exams will be announced on Blackboard and during lecture. It is your responsibility to know when the on-line exams will be available. Due to the constraints of on-line assessment, any extenuating circumstances must be brought to the instructors' attention before the test closes.

Final Exam. A written final exam will be given at the end of the course. The final exam will be comprehensive, and count for 20% of the overall course grade. The exam will be given during Final Exam Week, at the date, time, and location specified in the UM Final Exam Schedule. It is the responsibility of off-campus students to arrange a location and proctor for the final exam.

EET560 Requirement. A class project is required for those students taking EET560. The project will be team based, if possible. Each team will comprise of two students and will do a prototype design of a renewable energy system. The system can be simulated using Matlab/Simulink. The goal of the project is to assess the features of the system considered. The teams will be encouraged to come up with their project proposals and discuss it with the instructor for final approval on the scope. The team will prepare a written report and submit it with the simulation code.

### Grading:

20% - Homework

60% - Preliminary Exams

20% - Final Exam

% to Letter Grade Scale:

$\geq 93 = A$ ;  $90-92 = A-$ ;  $87-89 = B+$ ;  $83-86 = B$ ;  $80-82 = B-$ ;  $77-79 = C+$ ;  $73-76 = C$ ;  $70-72 = C-$ ;  $67-69 = D+$ ;  $63-66 = D$ ;  $60-62 = D-$ ;  $\leq 59 = F$

### Course Policies

Academic Honesty Statement URL: <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/>

Students with Disabilities Statement URL: <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Accessibility>

Course Schedule Disclaimer (Disruption Clause) URL: <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Schedule>

Observation of Religious Holidays/Events: <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Observance>

### 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 Title IX Student Services 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*: **Title IX Student Services: 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.

### **University of Maine COVID-19 Syllabus Statement**

COVID-19 is an infectious disease caused by the coronavirus SARS-CoV-2. The virus is transmitted person-to-person through respiratory droplets that are expelled when breathing, talking, eating, coughing, or sneezing. Additionally, the virus is stable on surfaces and can be transmitted when someone touches a contaminated surface and transfers the virus to their nose or mouth. When someone becomes infected with COVID-19 they may either have no symptoms or symptoms that range from mild to severe and can even be fatal. During this global pandemic, it is imperative that all students, faculty, and staff abide by the safety protocols and guidelines set forth by the University to ensure the safety of our campus. All students are encouraged to make



the Black Bear Cares Pact to protect the health of themselves, the health of others, and the College of Our Hearts Always.

**Black Bears Care Pact:** <https://umaine.edu/return/black-bears-care/>

**Symptom checking:** The symptoms of COVID-19 can range from mild to severe, and even people with mild symptoms may transmit the virus to others. Students are encouraged to use the symptom checking app each day before attending class or moving about campus and follow the recommendation prompted within the app. Students should monitor for the following symptoms daily: fever (temperature >100.4F/38.0C) or chills, new cough, loss of taste or smell, shortness of breath/difficult breathing, sore throat, diarrhea, nausea, or vomiting, or the onset of new, otherwise unexplained symptoms such as headache, muscle or body aches, fatigue, or congestion/runny nose.

**Physical distancing:** Students need to make every effort to maintain physical distancing (6 feet or more) indoors and outdoors including within classrooms. The University classrooms and physical spaces have been arranged to maximize physical distancing. Follow the traffic patterns outlined in each building and outdoor space to avoid crowding. If students are in an academic setting (i.e. clinical or lab class) that requires them to reduce physical distancing, they should follow the instructor's guidelines.

**Face coverings:** Students must wear appropriate face coverings in the classroom. Face coverings must be worn in indoor and outdoor spaces on campus unless people are alone in a room with a door closed or when they are properly physically distanced and do not expect someone to approach them. When face coverings are removed people are placing themselves and those surrounding them at increased risk for COVID-19.

**Eating and drinking in classrooms:** Students may not eat or drink in the classrooms and are encouraged to take their food or drink into areas designated for these purposes where they can maintain 6 feet physical distance from others.

**Hand hygiene:** Proper hand hygiene is an effective measure to prevent the spread of COVID-19. Students should wash their hands often with soap and water or use a hand sanitizer with at least 60% alcohol, especially after using the bathroom, before eating or drinking, and before and after going to class or university spaces such as the recreation center, library, or dining halls.

**Contingency plans:** Classes will be held in various formats to offer flexibility, compassion, and empathy during these unprecedented times. Under certain circumstances, students or instructors may need to miss classes or in-person classes may be disrupted. Students are expected to notify their instructor if they are unable to attend an in-person or online class but will not be penalized for missing class due to illness or the need to care for a family member affected by COVID-19. If a disruption occurs, your instructor will provide communication and contingency plans.

**What to do if you have or suspect you have COVID-19:** If you have symptoms of COVID-19 or have been possibly exposed to someone with COVID-19, you should stay home, not interact with others, and contact your health care provider immediately to be tested for COVID-19. You may not attend in-person classes and should suspend interactions with others until you are tested. Prior to receiving test results you should quarantine in your living area according to the Maine CDC guidelines below. Please follow the guidance of your health care professional regarding testing, quarantine, and isolation during the testing process and potential illness period.

**What to do if someone you know has or may have COVID-19:** If someone you know or that you have had close contact with (defined by the ME CDC as 15 mins or more within 6 feet or less) has tested positive for COVID-19, you should stay home and quarantine according to the guidance of the ME CDC, contact your health care provider, and continue to monitor for symptoms. You may be required to quarantine and/or be tested for COVID-19 under these circumstances. You may also have been exposed to COVID-19 by someone you do not know, and it is possible that you could be contacted through contact tracing to determine if you were exposed. Everyone should respond to these confidential questions to ensure the safety of themselves and those around them.

**Maine CDC guidelines:** <https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/airborne/coronavirus/general-information.shtml>

**If you have questions or would like additional information related to the University of Maine COVID-19-specific policies or procedures please use the following sources:**

University Webpages: [umaine.edu/return](http://umaine.edu/return) and [together.maine.edu](http://umaine.edu/together)

COVID-19 Information line: 207.581.2681

Emergency Operations Center Email Contact: [umaine.alerts@maine.edu](mailto:umaine.alerts@maine.edu)

**Course Schedule.** Dates when lectures, quizzes, and exams will be posted.

Date	Class	Quiz	Instructor
9/1	Intro		SDD / PLV
9/3	AC/DC Circuits	1	PLV
9/8	Three Phase Power		PLV
9/10	Thermo	2	SDD
9/15	The Utility Industry		PLV
9/17	Power Plant Design	3	PLV
9/22	Hydro		SDD
9/24	Exam 1		
9/29	Geothermal	4	SDD
10/1	Nuclear		PLV
10/6	Engines + CSP		SDD
10/8	Biomass	5	SDD
10/13	Intro to Fuel Cells		SDD
10/15	Fuel Cell Systems	6	SDD
10/20	Engineering Eco 1		PLV
10/22	Exam 2		
10/27	Engineering Eco 2	7	PLV
10/29	Intro to Wind		PLV
11/3	Wind Energy Conv		PLV
11/5	Wind Energy Eco	8	PLV
11/10	Wave and Tidal		SDD
11/12	Energy Storage		SDD

11/17	Renewable Energy Case Study	9	SDD
11/19	Solar Resource		SDD
11/24	PV Devices		SDD
12/1	Exam 3		
12/3	PV Power Systems	10	SDD
12/8	Distributed Generation		PLV
12/10	Battery Storage Systems		PLV



**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 Electrical Engineering Technology

COURSE DESIGNATOR EET COURSE NUMBER 584 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Engineering Economics

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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)

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

**Mohamad Musavi** Digitally signed by Mohamad Musavi  
Date: 2021.02.14 15:07:02 -05'00'

College Dean(s)

**Dana N Humphrey** Digitally signed by Dana N Humphrey  
Date: 2021.03.26 17:48:39 -04'00'

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):

EET 584 - Engineering Economics

Prerequisite: Senior Standing in the School of Engineering Technology; graduate standing or Instructor Permission. Credit hours: 3

Description: A study of economic theory and applications in engineering and industrial organizations including capitalization, amortization, time value of money, cost comparison analysis, breakeven value, and the ethics of engineering economic decision making. Also included are personal finance topics as applied to engineering situations and case study. EET 484 and EET 584 can not both be taken for credit.

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

- |  |   |  |  |                                 |
|--|---|--|--|---------------------------------|
| <input type="checkbox"/> Applied Music | <input type="checkbox"/> Clinical                   | <input type="checkbox"/> Field Experience/Internship | <input type="checkbox"/> Research          | <input type="checkbox"/> Studio |
| <input type="checkbox"/> Laboratory    | <input checked="" type="checkbox"/> Lecture/Seminar | <input type="checkbox"/> Recitation                  | <input type="checkbox"/> Independent Study | <input type="checkbox"/> Thesis |

Text(s) planned for use:

Engineering Economic Analysis (13th Edition)  
Oxford University Press, 2017  
Newnan, Eschenbach, Lavelle  
ISBN 978-0-19-029690-2

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

John Allen, Associate Professor (in EET), full-time teaching load (fall, winter)  
Jude Pearse, Professor (in MET), full-time teaching load (spring, summer)

Reason for new course:

The proposed course will be cross-listed with the undergraduate course EET 484. There will be additional assignments justifying the graduate component (see the syllabus). This graduate course will be used to support an upcoming graduate certificate in EET as well as a possible graduate program in EET.

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.

No other departments will be affected. This has overlap with the undergraduate version of the course (EET 484). These two courses will be cross-listed with additional research components for the graduate version of the course.

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?

EET 484 is taught every fall, winter, spring, and summer and is supported (financially) by DLL. The proposed graduate course will be taught simultaneous with EET 484 (cross-listed). Continued DLL support is requested for this new graduate course.

## EET 484/584 – Engineering Economics

### Required Textbook

*Engineering Economic Analysis (13<sup>th</sup> Edition)*  
Oxford University Press, 2017  
Newnan, Eschenbach, Lavelle  
ISBN 978-0-19-029690-2

### Required Software

Microsoft Excel (or equivalent). All course material will be distributed via Brightspace.

### Instructor

Prof. John W. Allen, PE  
Room 11, Barrows Hall  
(207) 581-4991 (office)  
(207) 944-7254 (cell) (best way to reach me is by texting)  
[john.w.allen@maine.edu](mailto:john.w.allen@maine.edu)

Feel free to contact me on my cell phone. I turn my ringer off when I'm not available, so don't worry about bothering me. Feel free to text me as well. If you text me, please give me your name and what class you're enrolled in.

### Course Description

A study of economic theory and applications in engineering and industrial organizations including capitalization, amortization, time value of money, cost comparison analysis, breakeven value, and the ethics of engineering economic decision making. Also included are personal finance topics as applied to engineering situations and case study.

### Course Goals

To help students solve engineering economics problems. Students will learn interest, time value of money, and personal finance topics. Additional case studies may be presented if time permits.

### Student Learning Outcomes

Learning outcomes, and measurements of those outcomes, include:

#	Topic	Measurable Action
1	Economic decision making and ethical implications of these decisions.	There is an in-class (group) exercise related to the engineering decision making process and the ethical implications of these. This is a graded group exercise.  The first homework assignment will also have questions related to this topic.
2	Estimating engineering costs and benefits, and reducing societal costs (e.g. green engineering,	This will be a big portion of the second homework assignment.

	local and national impacts of economic decision making).	There is also an in-class assignment (graded) related to reducing societal costs.
3	Interest (simple and compound), equivalence and cash flows.	Several group exercises are related to interest. Interest, being a human institution, is a large focus of chapter 3.  There is a homework assignment related to simple and compound interest, and its impact on several human institutions (mortgages, car loans, investments, etc.).
4	Repeated cash flows, investments, loans.	There is a homework assignment for repeated cash flows, investments, and loans.  There is also an in-class quiz (or two) related to this topic.
5	Present worth analysis, annual cash flow analysis, rate of return, and amortization. Emphasis will be placed on real estate investing, regional dependence of investment opportunities, renting vs. buying properties, etc.	There is a homework assignment related to this topic.  There is a bonus assignment related to mortgage calculations. This will be based on an actual home purchase (with different terms, rates, etc.)
6	Applying green engineering to bids, quotes, cost analysis, etc., and the impact of these processes.	There is an in-class group exercise where we focus on minimizing societal costs and applying green engineering principals to bids with similar dollar values.
7	Studying human institutions such as banks, the stock market, interest rates, etc. and the impact on individuals and companies. This is accomplished through – for example – the study of amortization schedules, real estate investing, present worth analysis dependency on rates, future value of investments based on terms and rates, etc. Most importantly, the entire course will study the impact of interest rates on all financial decision making (from initial planning to future investments).	Five homework assignments use rates as a primary factor. So, all five assignments are used to measure the student's ability to demonstrate the outcome.  The HV/SC general education objective is demonstrated through all five of these homework assignments, with rates (as a human institution) factoring into every one of the engineering economics decision making steps.  Real estate investing is discussed, and a bonus assignment is given to the students where they look at all the terms related to investing in a rental property.

### Ethics in Engineering

Most engineering students will become part of the Order of the Engineer or the National Society or Professional Engineers. Both organizations hold paramount the ethical responsibilities of engineers. A few examples from their preambles: hold paramount the safety, health, and welfare of the public; perform services only in the areas of their competence; avoid deceptive acts; and conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

In this course, ethics is integrated into every chapter that we'll be studying. Minimizing societal costs ("green engineering") will play an important role in the engineering decision making process, formulating bids/quotes, and comparing economic alternatives.

### Prerequisites

Senior Standing in the School of Engineering Technology or Instructor Permission

### Lectures

Lectures for EET 484 will be Tuesdays & Thursdays 5:00pm-6:15pm live on Zoom (for fall 2020; course class times may vary by semester). I will also record the lectures so you can watch at another time.

### Office Hours

Office hours will be by appointment via Zoom. I will also have fixed office hours (via Zoom) that will be posted on Brightspace.

### Grading

Grading will be based on homework assignments, exams, and projects/quizzes. The grade equation is as follows:

$$\text{Grade} = 0.4 * (\text{homework average}) + 0.4 * (\text{exam average}) + 0.2 * (\text{projects/quizzes})$$

There will be approximately six to seven homework assignments during the semester worth a total of 40% of the course grade. There will be three exams during the semester worth 40% (13.33% each). And, there will be multiple quizzes/projects worth 20%. The date of the quizzes/projects will not be announced (they will be announced in lectures). This is tentative.

### Expectations for EET584

EET584 is intended for students in the graduate program or desiring to enroll in a graduate program. As a result, additional expectations of work are required to demonstrate successful completion of the EET584 course. Two additional projects are required on top of the normal EET484 expectations. Both projects will be independent research-type projects related to financial planning and/or investing. Projects may change each semester and the details will be discussed during the first few weeks of the course. You are required to complete both of these additional projects to receive a passing grade in EET584.

The grading scale will be as follows (with points rounded to the nearest whole number):

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
≥93	90- 92	87- 89	83- 86	80- 82	77- 79	73- 76	70- 72	67- 69	63- 66	60- 62	<60

Course Schedule: The following is a tentative course schedule. See the Brightspace class folder for schedule updates or changes (changes may also be announced in class).



WEEK #	DAY	Date	MATERIAL TO BE COVERED	Assignments (HW, Exams, Projects)
Week 1	Tuesday	1-Sep	Chapter 1 - Making Economic Decisions (& Review Syllabus)	
	Thursday	3-Sep		
Week 2	Tuesday	8-Sep		
	Thursday	10-Sep	Chapter 2 - Estimating Engineering Costs and Benefits	
Week 3	Tuesday	15-Sep		Homework 1 Due
	Thursday	17-Sep		
Week 4	Tuesday	22-Sep	Chapter 3 - Interest and Equivalence	
	Thursday	24-Sep		Homework 2 Due
Week 5	Tuesday	29-Sep	<b>EXAM 1</b>	
	Thursday	1-Oct	Chapter 4 - Equivalence for Repeated Cash Flows	
Week 6	Tuesday	6-Oct		Homework 3 Due
	Thursday	8-Oct		
Week 7	Tuesday	13-Oct	<b>NO CLASS</b>	
	Thursday	15-Oct	Chapter 5 - Present Worth Analysis	
Week 8	Tuesday	20-Oct		Homework 4 Due
	Thursday	22-Oct		
Week 9	Tuesday	27-Oct	<b>EXAM 2</b>	
	Thursday	29-Oct	Chapter 6 - Annual Cash Flow Analysis	
Week 10	Tuesday	3-Nov		Homework 5 Due
	Thursday	5-Nov		
Week 11	Tuesday	10-Nov		
	Thursday	12-Nov	<b>NO CLASS</b>	
Week 12	Tuesday	17-Nov	Chapter 7 - Rate of Return Analysis	Homework 6 Due
	Thursday	19-Nov		
Week 13	Tuesday	24-Nov		
	Thursday	26-Nov	<b>NO CLASS</b>	
Week 14	Tuesday	1-Dec	Bonus Engineering Economics Topics	Homework 7 Due
	Thursday	3-Dec	<b>EXAM 3</b>	
Week 15	Tuesday	8-Dec	Bonus Engineering Economics Topics	
	Thursday	10-Dec	Bonus Engineering Economics Topics	

**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.

**Required Statements:**

**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. Please see the University of Maine System's Academic Integrity Policy listed in

the Board Policy Manual as Policy 314: <https://www.maine.edu/board-of-trustees/policy-manual/section-314/>

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 (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 (due to COVID-19 or other long-term disruptions), 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 Title IX Student Services 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: Title IX Student Services: 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.

University of Maine COVID-19 Syllabus Statement: COVID-19 is an infectious disease caused by the coronavirus SARS-CoV-2. The virus is transmitted person-to-person through respiratory droplets that are expelled when breathing, talking, eating, coughing, or sneezing. Additionally, the virus is stable on surfaces and can be transmitted when someone touches a contaminated surface and transfers the virus to their nose or mouth. When someone becomes infected with COVID-19 they may either have no symptoms or symptoms that range from mild to severe and can even be fatal. During this global pandemic, it is imperative that all students, faculty, and staff abide by the safety protocols and guidelines set forth by the University to ensure the safety of our campus. All students are encouraged to make the Black Bear Cares Pact to protect the health of themselves, the health of others, and the College of Our Hearts Always.

Black Bears Care Pact: <https://umaine.edu/return/black-bears-care/>

Symptom checking: The symptoms of COVID-19 can range from mild to severe, and even people with mild symptoms may transmit the virus to others. Students are encouraged to use the symptom checking app each day before attending class or moving about campus and follow the recommendation prompted within the app. Students should monitor for the following symptoms daily: fever (temperature >100.4F/38.0C) or chills, new cough, loss of taste or smell, shortness of breath/difficult breathing, sore throat, diarrhea, nausea, or vomiting, or the onset of new, otherwise unexplained symptoms such as headache, muscle or body aches, fatigue, or congestion/runny nose.

Physical distancing: Students need to make every effort to maintain physical distancing (6 feet or more) indoors and outdoors including within classrooms. The University classrooms and physical spaces have been arranged to maximize physical distancing. Follow the traffic patterns outlined in each building and outdoor space to avoid crowding. If students are in an academic setting (i.e. clinical or lab class) that requires them to reduce physical distancing, they should follow the instructor's guidelines.

Face coverings: Students must wear appropriate face coverings in the classroom. Face coverings must be worn in indoor and outdoor spaces on campus unless people are alone in a room with a door closed or when they are properly physically distanced and do not expect someone to approach them. When face coverings are removed people are placing themselves and those surrounding them at increased risk for COVID-19.

Eating and drinking in classrooms: Students may not eat or drink in the classrooms and are encouraged to take their food or drink into areas designated for these purposes where they can maintain 6 feet physical distance from others.

Hand hygiene: Proper hand hygiene is an effective measure to prevent the spread of COVID-19. Students should wash their hands often with soap and water or use a hand sanitizer with at least 60% alcohol, especially after using the bathroom, before eating or drinking, and before and after going to class or university spaces such as the recreation center, library, or dining halls.

Contingency plans: Classes will be held in various formats to offer flexibility, compassion, and empathy during these unprecedented times. Under certain circumstances, students or instructors may need to miss classes or in-person classes may be disrupted. Students are expected to notify their instructor if they are unable to attend an in-person or online class but will not be penalized for

missing class due to illness or the need to care for a family member affected by COVID-19. If a disruption occurs, your instructor will provide communication and contingency plans.

**What to do if you have or suspect you have COVID-19:** If you have symptoms of COVID-19 or have been possibly exposed to someone with COVID-19, you should stay home, not interact with others, and contact your health care provider immediately to be tested for COVID-19. You may not attend in-person classes and should suspend interactions with others until you are tested. Prior to receiving test results you should quarantine in your living area according to the Maine CDC guidelines below. Please follow the guidance of your health care professional regarding testing, quarantine, and isolation during the testing process and potential illness period.

**What to do if someone you know has or may have COVID-19:** If someone you know or that you have had close contact with (defined by the ME CDC as 15 mins or more within 6 feet or less) has tested positive for COVID-19, you should stay home and quarantine according to the guidance of the ME CDC, contact your health care provider, and continue to monitor for symptoms. You may be required to quarantine and/or be tested for COVID-19 under these circumstances. You may also have been exposed to COVID-19 by someone you do not know, and it is possible that you could be contacted through contact tracing to determine if you were exposed. Everyone should respond to these confidential questions to ensure the safety of themselves and those around them.

Maine CDC guidelines: <https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/airborne/coronavirus/general-information.shtml>

If you have questions or would like additional information related to the University of Maine COVID-19-specific policies or procedures please use the following sources:

University Webpages: [umaine.edu/return](http://umaine.edu/return) and [together.maine.edu](http://together.maine.edu)

COVID-19 Information line: 207.581.2681

Emergency Operations Center Email Contact: [umaine.alerts@maine.edu](mailto:umaine.alerts@maine.edu)

Students with Disabilities (additional information): Students with special needs should notify the instructor in advance of any activity that may require special equipment or accommodations. The instructor shall make reasonable attempts to ensure that the student's needs are met.

Classroom Interaction: Learning the material is enhanced when the classroom experience promotes active student engagement. As a result, there will be many in-class opportunities to interact with the instructor and other students during the class time. In this type of environment, something may come up that may offend an individual. Please contact me if this occurs and the situation will be corrected. In addition, students participating in class shall not be chastised or criticized for their effort by other students. Any student comments directed at other students that may be construed as derogatory will not be tolerated. Any behavior that is deemed detrimental to the learning environment will result in the student being asked to leave the class. Continued poor behavior will result in the student being dropped from the class. If any issues arise, feel free to contact the instructor.

Additional Information: The best way to succeed in this course is to come to all lectures and complete all homework assignments. Come see me right away if you are having difficulties in this course. Also, don't be a stranger. Participate in Zoom sessions, email me, text me, etc. I'm new to teaching this course but love the material and want to see each and every student succeed. If you are willing to put in the extra time, I'm willing to help in any way possible. Best of luck this semester!

Updated language for the required statements can be found at:

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



**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 School of Forest Resources

COURSE DESIGNATOR SFR COURSE NUMBER 548 EFFECTIVE SEMESTER Sp 22

COURSE TITLE Quantitative Social Science for Natural Resource Management

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)**

Stephen Shaler Digitally signed by Stephen Shaler  
Date: 2021.04.26 12:19:41 -04'00'

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

College Dean(s)

Christopher Gerbi Digitally signed by Christopher Gerbi  
Date: 2021.04.26 12:56:14 -04'00'

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):

SFR 548, Quantitative Social Science for Natural Resource Management, no prerequisites, 3 credit hours

Theory and application of methods for quantifying socio-economic dimensions of natural resource management. Contribution of social science, human dimensions, and resource management at multiple scales. Integration of natural and social sciences to quantify and assess trade offs for the complex dimensions of resource management.

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. Students will be asked to read journal articles, policy briefs, white papers, and other texts from a variety of sources.

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

Dr. Adam Daigneault, E.L. Giddings Associate Professor of Forest, Conservation, and Recreation Policy, 50% Teaching Appointment in the School of Forest Resources

Reason for new course:

Dr. Daigneault has been approached by numerous faculty and graduate students to offer a course based on his expertise in quantitative social science, systems thinking, and decision support tools. In Spring 2020, the instructor trialed a similar course structure under 'SFR 611: Research Problems in Forest Economics'. The course has 11 students enrolled from five different departments and was very well received. The interdisciplinary nature of the course content and focus on non-statistical quantitative tools will provide students with the general knowledge and methods for integrated systems thinking that is important for interdisciplinary research. It will also provide exposure to a broad set of methods that are useful for professionals working in academia, government, and non-profit organizations.

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.

N/A

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

There are no other graduate level courses on quantitative social science and natural resource management offered at UMaine.

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?

The course will be offered every other Spring semester, during even years . Dr. Daigneault is scheduled to teach a graduate-level course in SFR every other year. This course will fulfill that requirement without increasing his teaching load.

**SFR 548**  
**Quantitative Social Science for Natural Resource Management**  
**Spring 2022 Syllabus**

**Course Description (3 Credits)**

*"Theory and application of methods for quantifying socio-economic dimensions of natural resource management. Contribution of social science, human dimensions, and resource management at multiple scales. Integration of natural and social sciences to quantify and assess tradeoffs for the complex dimensions of resource management."*

**Class Schedule:** 2 days/week, 75 minutes/day

**Professor**

Dr. Adam Daigneault, Assistant Professor of Forest, Conservation, and Recreation Policy  
University of Maine School of Forest Resources  
Office: 219 Nutting Hall  
Phone: (207) 581-2805  
Email: [adam.daigneault@maine.edu](mailto:adam.daigneault@maine.edu)

**Office Hours:** Nutting 219, Tuesday/Thursday 9:00 to 10:45, or by appointment

**Course Credits:** 3

**Prerequisites:** None

**Course Materials**

There is no required textbook. All reading will be assigned in class and/or posted on the course website, which is being administered through Google Classroom. Please contact me if you have not received an invitation.

**Course Objectives**

This course introduces graduate students to quantitative analysis of natural resource management, with a focus on social science methods and applications. It is intended to be a hands-on, application-oriented class, helping students develop the skills necessary to carry out empirical analyses of natural resource management issues that especially lend themselves to quantitative specification. A key component of the course is to provide students with the general knowledge and methods for integrated systems thinking that is important for interdisciplinary research. It will also provide exposure to a broad set of methods that are useful for professionals working in academia, government, and non-profit organizations.

The course will utilize case studies and empirical examples to illustrate the complexities of natural resource management and align theory with reality. Various methods and applications related to global, regional, and local natural resource management issues will be investigated. This integration of natural and social sciences coupled with empirical applications will also help students understand how public values and opinions about natural resources have been formed and developed into current day policy and management. The course will primarily focus on applications for the Maine and the U.S., but additional readings will evaluate resource management from an international perspective.



## Quantitative Social Science for Natural Resource Management

Topics/methods covered in this course include:

- Benefit-cost analysis
- Systems thinking and modeling
- Scenario development
- Survey design and enumeration
- Ecosystem service valuation and assessment
- Sensitivity analysis
- Policy assessment

A tentative schedule for the course is listed at the end of the syllabus. A final course schedule will be established after students reveal their interest in taking this course and skills that they may need to assist with their research and professional goals.

### Learning outcomes for SFR 548

Upon successful completion of this class, students will: (1) understand conceptual frameworks for thinking about problems related to managing natural resources; (2) become proficient in some practical analytical tools/skills that have proven useful making natural resource management decisions; (3) have the skills to take an integrated and multidisciplinary approach to quantifying complex problems applied to natural resources.

### Grading

Final grades for graduate students will be based on the following assignments and breakdown:

<b>Component</b>	<b>Maximum Points</b>
Class participation	20
Problem assignments	45
Final presentation	15
Final paper	20
<b>Total</b>	<b>100</b>

All students are expected to complete each component of the course on their own (i.e., no group papers or presentations).

Grades are assigned based on the total accumulated points over the course of the semester:

<b>Grade</b>	<b>Points</b>
A- to A	90-100
B- to B+	80-89
C- to C+	70-79
D- to D+	60-69
F	< 60

### Class Participation

This course will feature a lot of in-class discussion of readings and application of tools. All students are expected to lead a 30-minute class discussion of a research article related to at least one of the course topics. The topics that we will likely cover are listed in the 'Course Objectives' section of syllabus, and I will provide a more formal schedule of topics after I gauge student interests and determine how long we should spend on each topic. The student will be responsible for choosing the article, which I will disseminate via Google Classroom at least 2 days before the discussion will be held. To facilitate the allocation of topics, I would like each student to submit a list of the top 3 topics that you wish to lead a discussion on by Tuesday, January 25. Please contact me if you are uncertain about what topic you would like to discuss.

### Problem Assignments

The course will feature a series of assignments that apply the methods and tools presented in the lectures and reading materials. These assignments will be due approximately every two weeks and be worth 5 to 10 points each.

### Final Paper & Presentation

You will develop a paper and presentation related to natural resource management and social sciences that utilizes at least one method or tool that we cover in class. For efficiency, I suggest you relate it to your graduate research. This 'paper' does not necessarily have to be a formal research paper. For example, it can also be a benefit cost analysis or systems analysis related to your project or a detailed policy assessment.

All students will give a final presentation on their research project during the last week of classes. Given the size of the class, I anticipate that each presentation will be restricted to 15 minutes. I will provide more information on the structure of the presentation later in the semester.

The due dates for various components of this assignment are:

Component	Due Date
Meet with me to finalize topic	by March 12
Submit draft outline of paper	March 31
Submit draft of paper to peer for review	April 21
Final presentation	April 28 & April 30
Submit final paper	May 8

### Expectations and Professionalism

You are expected to follow the Professional Guidelines and Expectations for SFR Students. You can find a copy of the Guidelines on the SFR website.

### Civility in the Classroom

The goal of the University of Maine is to provide students with the knowledge, skills, and wisdom you need to contribute to society. My expectations are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. In this class, I expect students to follow a few simple courtesies that will help me teach in an atmosphere conducive to learning:

1. **Come to class on time.** If you must be late, please enter as quietly as possible.

2. **Come to class prepared and ready to participate.** Sound policy development requires active participation and vibrant discussion.
3. **Do not disturb the class** by rustling papers, zipping backpacks, standing up, or leaving while lecture is going on or while students are raising questions for discussion.
4. **Questions are encouraged at any time.** Give students who raise questions the courtesy of your attention. If your question requires a particularly lengthy answer, I may ask you to meet me after class.

Students with family or military responsibilities and those for whom English is not a primary language are invited to discuss their situations with me at the beginning of the term.

I am dedicated to establishing a learning environment that promotes diversity of race, cultures, genders, sexual orientations, learning styles, and physical abilities. If you notice discriminatory comments in this class, or if you feel discriminated against, please let me know. **Behaviors or language that create a hostile, offensive or intimidating environment will not be tolerated.**

### **Email Policy**

I welcome contact via email for course-related questions and do not want to discourage anyone from doing so; however, I hope that you will first attempt to use your resources (e.g., your syllabus, handouts, your peers, office hours, etc.) to address your questions before sending an email. I expect emails to me from students (and vice versa) to be composed professionally with complete sentences and proper English writing style with no spelling mistakes or cryptic abbreviations (i.e., an email is not a text message), a clear subject line and a clear, concise question. During the weekdays, I reserve the right to have at least a 36-hour turnaround time for answering emails and 60 hours on weekends.

### **Academic Honesty**

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. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314 (**\*Date Issued:** September 1, 2020): <https://www.maine.edu/board-of-trustees/policy-manual/section-314/>

### **Students Accessibility Services**

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 Dr. Adam Daigneault privately as soon as possible.

### **Course Schedule Disclaimer (Disruption Clause)**

In the event of an extended disruption of normal classroom activities (due to COVID-19 or other long-term disruptions), 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.

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### **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/>

**Tentative Course Schedule\***

The following is a schedule for the general structure of the course. It is subject to change to accommodate other schedule conflicts or need. Students should consult the Google Classroom site on a regular basis to confirm the order of lecture topics, assigned readings, and due dates.

Week	Day	Date	Topic	Assignment
1	TBD	TBD	Course introduction	
	TBD	TBD	Benefit-cost analysis	
2	TBD	TBD	Benefit-cost analysis	
	TBD	TBD	Benefit-cost analysis	
3	TBD	TBD	Benefit-cost analysis	
	TBD	TBD	Systems Modeling	
4	TBD	TBD	Systems Modeling	BCA
	TBD	TBD	Systems Modeling	
5	TBD	TBD	Systems Modeling	
	TBD	TBD	Scenario Development	
6	TBD	TBD	Scenario Development	Systems Model
	TBD	TBD	Scenario Development	
7	TBD	TBD	Survey Design and enumeration	
	TBD	TBD	Survey Design and enumeration	Scenario Development
8	TBD	TBD	Survey Design and enumeration	
	TBD	TBD	Survey Design and enumeration	
9	TBD	TBD	Spring Break	
	TBD	TBD		
10	TBD	TBD	Mental models	Draft Survey
	TBD	TBD	Ecosystem Service valuation and assessment	
11	TBD	TBD	Ecosystem Service valuation and assessment	
	TBD	TBD	Ecosystem Service valuation and assessment	
12	TBD	TBD	Sensitivity Analysis	
	TBD	TBD	Sensitivity Analysis	ES Assessment
13	TBD	TBD	Policy Assessment	
	TBD	TBD	Policy Assessment	
14	TBD	TBD	Policy Assessment	
	TBD	TBD	Policy Assessment	Policy Memo
15	TBD	TBD	Final Presentations	Presentations
	TBD	TBD	Final Presentations	Presentations
16	TBD	TBD	Final Paper	Final Paper

\*Order and timing of topics and problem assignment due dates subject to change. Please consult the Google Classroom course site for the latest course schedule.



**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 School of Forest ResourcesCOURSE DESIGNATOR SFR COURSE NUMBER 589 EFFECTIVE SEMESTER Fall 2021COURSE TITLE Tools for Consulting Foresters**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     Description Change     Cross Listing (must be at least 400-level)<sup>1</sup>  
 Number Change     Prerequisite Change     Other (specify) \_\_\_\_\_  
 Title Change     Credit Change

**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)**Stephen ShalerDigitally signed by Stephen Shaler  
Date: 2021.02.08 09:08:26 -05'00'College(s) Curriculum Committee Chair(s) [if applicable]  
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: SFR  
Number: 589  
Title: Tools for Consulting Foresters  
Prerequisites: none  
Credit Hours: 1  
Does it meet Service-Learning?: No  
Description:  
Hands-on experience with software applications and field techniques useful for creating small woodlot forest management plans including: mapping, forest inventories, resource evaluation and assessments, growth and yield programs, spreadsheets and other office software. SFR 489 and SFR 589 cannot both be taken for degree credit.

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:

Murgia, Louise. 2013. Introduction to Consulting Forestry. Society of American Foresters. Bethesda, MD.  
Additionally, there will be online videos and PDF handouts made available instead of a formal, expensive textbook.

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

Dr. Jessica Leahy. Professor of Human Dimensions of Natural Resources; MF Program Coordinator. 50% teaching, SFR 220 (3 cr), SFR 452 (4 cr, alt yr), SFR 489 (1-4 cr), SFR 490 (1-4 cr), SFR504 (4 cr, alt yr.)

Reason for new course:

Instruction on forest management plans is essential for the Masters of Forestry students and Society of American Foresters accreditation. Due to loss of a faculty position, the teaching of SFR 577 - Forest Landscape Management is uncertain, and an alternative course is immediately needed. SFR 589 will provide hands-on experience for becoming familiar with what's needed for a forest management plan and how to collect the information. The would will better prepare MF students for the option to developing a full forest management plan for SFR 690 - Masters of Forestry Project.

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 course will be crosslisted with SFR 489 such that the course will be required for the BS in Forestry and Masters of Forestry.

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 fall semester. No overload pay is needed.



**SFR 489/589: Tools for Consulting Foresters  
Fall 2021**

**Instructor:**

Dr. Jessica Leahy  
jessica.leahy@maine.edu  
207-313-7933 (text/phone)

**Course Description:**

Hands-on experience with software applications and field techniques useful for creating small woodlot forest management plans including: mapping, forest inventories, resource evaluation and assessments, growth and yield programs, spreadsheets and other office software. SFR 489 and SFR 589 cannot both be taken for degree credit.

**Course Goals and Learning Outcomes:**

This lab can be used as the beginning of SFR 490- Small Woodlot Management and SFR 690- Master of Forestry Project. During SFR489/589, you will begin working with the property you will use for your management plan in SFR 490 or SFR 690. As such, SFR 489/589 and SFR 490/690 have integrated goals. For students not completing a forest management plan for SFR490/690, SFR489/589 provides the critical exposure to small woodlot management and their forest management plans needed to meet SFR and SAF-accreditation learning outcomes.

After successful completion of the course, students will:

1. Be able to operate tools (e.g., software applications and field techniques) essential for developing small woodlot forest management plans;
2. Be able to develop a workplan and complete field work needed to complete a forest management plan (e.g., your inventory).
3. Be able to communicate forest management information in a professional manner.

**Credits:** 1

**Times:**

Field Session - Fridays 1-4:50PM

Optional Remote Access to Computer Labs – Wednesdays 11AM-2PM

**Field Session Location:**

Field sessions will be held at Orono Land Trust's Piney Knoll parcel, beginning at the trailhead located at the end of Coburn Drive in Orono. A map can be found here:

<https://oronolandtrust.org/wp-content/uploads/2020/06/Piney-Knoll-Conservation-Area-Trail-Map-2020-04-07.jpg>

**Office Hours:**

Wednesday 11AM-2PM by Zoom. I will be available during the remote access computer lab session times to troubleshoot any issues you run into.

**Textbook:**

Murgia, Louise. 2013. Introduction to Consulting Forestry. Society of American Foresters. Bethesda, MD.

Additionally, there will be online videos and PDF handouts made available instead of a formal, expensive textbook.

**Equipment:**

You need to supply your own diameter tape for inventory work. You may borrow a CruzAll for the semester, which can be used to cruise at a 10BAF equivalent. If you will be working in forestry in the future, you might consider purchasing a pair of 10BAF and 15BAF prisms to use instead of the CruzAll. I will also have dbh height poles available.

**Grading:**

Grades will be assigned as follows:

- A 90-100%
- B 80-89%
- C 70-79%
- D 60-69%
- F <60%

Grades will be based on:

	489	589
Homework Sets	50	50
Trip Reports	45	20
Presentation	5	5
Forest Management Plan (FMP) Write-Ups		25

The 11 homework sets will be 1-3 pages long. Trip reports will be <1 page long. The presentations will be 7-10 minutes long. The 589 only forest management plan write-ups will generally be 1 page long. By the end of the semester, SFR489 students will have written around 20-30 pages of homework and trip reports. SFR589 students will have written 30-40 pages or homework, trip reports, and forest management plan write-ups.

**Civility and Professionalism in the Field:** The goal of the University of Maine is to provide students with the knowledge, skills, and wisdom you need to contribute to society as foresters. My expectations are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each

other with dignity and respect in order for learning to thrive.

I am dedicated to establishing a learning environment that promotes diversity of race, cultures, gender, sexual orientations, learning styles, and physical abilities. If you prefer a name or pronoun other than what is indicated on the class roster, please let me know. Behaviors or language that create a hostile, offensive or intimidating environment will not be tolerated.

You are expected to follow the Professional Guidelines and Expectations for SFR Students. You can find it online at:

<https://drive.google.com/file/d/12oeXgTpmrFbz9yCFRtQn8vkNMIXHCY15/>

**Voter Registration:** The University of Maine is committed to empowering all eligible students to exercise their right to vote as democratic citizens. The university will offer numerous opportunities in the lead-up to elections for you to register to vote, learn how to request an absentee ballot, and get non-partisan information so that you can make informed choices at the polls.

Note that if you are living locally while attending UMaine, you are likely eligible to register to vote in the community in which you currently reside.

For information on how to register to vote, how to request an absentee ballot and more, visit <https://umaine.edu/studentlife/uvote/> or follow UMaine UVote on Facebook or @um.uvote on Instagram. If you have questions about voting, you can contact a UMaine UVote team member at [um.uvote@maine.edu](mailto:um.uvote@maine.edu).

### 2021 Course Outline & Homework Assignments

Friday, September 3	General Assessment
Friday, September 10	Forest Inventory <i>Homework Set #1 due 9/10</i> <i>Trip Report #1 due 9/17</i> <i>589 only – General Assessment FMP Write-up due 9/17</i>
Friday, September 17	Forest Inventory <i>Homework Set #2 due 9/17</i> <i>Trip Report #2 due 9/24</i> <i>589 only – Field Methods FMP Write-up due 9/24</i>
Friday, September 24	Invasive Plants <i>Homework Set #3 due 9/24</i> <i>Trip Report #3 due 10/1</i> <i>589 only – Invasive Plants FMP Write-Up due 10/1</i>

Friday, October 1	Ecological Features & Vernal Pools <i>Homework Set #4 due 10/1</i> <i>Trip Report #4 due 10/8</i> <i>589 only – Ecological Features &amp; Vernal Pools FMP Write-Up due 10/8</i>
Friday, October 8	Forest Health <i>Homework Set #5 due 10/8</i> <i>Trip Report #5 due 10/15</i> <i>589 only – Forest Health Write-Up due 10/15</i>
Friday, October 15	Cultural Resources & Non-Timber Forest Products <i>Homework Set #6 due 10/15</i> <i>Trip Report #6 due 10/22</i> <i>589 only – Cultural Resources &amp; Non-Timber Forest Products FMP Write-Up due 10/22</i>
Friday, October 22	Recreation Management <i>Homework Set #7 due 10/22</i> <i>Trip Report #7 due 10/29</i> <i>589 only – Recreation Management FMP Write-Up due 10/29</i>
Friday, October 29	Soils, BMPs, & Harvest Aesthetics <i>Homework Set #8 due 10/29</i> <i>Trip Report #8 due 11/5</i> <i>589 only - Soils, BMPs, &amp; Harvest Aesthetics FMP Write-Up due 11/5</i>
Friday, November 5	Forestry for the Birds <i>Homework Set #9 due 11/5</i> <i>Trip Report #9 due 11/12</i> <i>589 only – Forestry for the Birds FMP Write-Up due 11/12</i>
Friday, November 12	FVS – Intro & Inventory Processing
Friday, November 19	FVS, cont. & Spreadsheets <i>Homework Set #10 due 11/19</i> <i>589 only – Stand Descriptions FMP Write-Up</i>
Friday, November 26	NO CLASS - THANKSGIVING
Friday, December 3	Family Forests & Small Woodlot Management Plans <i>Homework Set #11 due 12/3</i> <i>589 only – FMP outline</i>

Friday, December 10

Final Presentations  
*Presentations due 12/10*

Friday, December 17

NO FINAL – LAST DAY FOR INVENTORY

**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. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314: <https://www.maine.edu/board-of-trustees/policy-manual/section-314/>

**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 (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 (due to COVID-19 or other long-term disruptions), 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 any of your teachers about sexual discrimination involving members of the campus, **your teacher is required to report** this information to Title IX Student Services or the Office of Equal Opportunity.

Behaviors that can be "sexual discrimination" include sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence),

sexual misconduct, and gender discrimination. Therefore, all of these behaviors must be reported.

**Why do teachers have to report sexual discrimination?** The university can better support students in trouble if we know about what is happening. Reporting also helps us to identify patterns that might arise – for example, if more than one victim reports having been assaulted or harassed by the same individual.

**What will happen to a student if a teacher reports?** An employee from Title IX Student Services or the Office of Equal Opportunity will reach out to you and offer support, resources, and information. You will be invited to meet with the employee to discuss the situation and the various options available to you.

If you have requested confidentiality, the University will weigh your request that no action be taken against the institution's obligation to provide a safe, nondiscriminatory environment for all students. If the University determines that it can maintain confidentiality, you must understand that the institution's ability to meaningfully investigate the incident and pursue disciplinary action, if warranted, may be limited. There are times when the University may not be able to honor a request for confidentiality because doing so would pose a risk to its ability to provide a safe, nondiscriminatory environment for everyone. If the University determines that it cannot maintain confidentiality, the University will advise you, prior to starting an investigation and, to the extent possible, will share information only with those responsible for handling the institution's response.

The University is committed to the well-being of all students and will take steps to protect all involved from retaliation or harm.

**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:* **Title IX Student Services: 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.](#)



**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 Modern Languages & Classics

COURSE DESIGNATOR SPA COURSE NUMBER 519 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Rebels & Realists in 19C Literature

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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)

Gregory Zaro

Digitally signed by Gregory Zaro  
Date: 2021.04.05 06:39:15 -04'00'

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

Thane Premow [Signature] 4-21-21

College Dean(s)

Timothy M. Cole 4.19.2021

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: SPA  
Number: 519  
Title: Rebels & Realists in 19C Literature  
Prerequisites: Graduate standing or permission  
Credit Hours: 3,0  
Description:

This course analyzes a broad selection of literary texts from the 19th century, a period of revolutions, rapid industrialization, and radical politics. A particular emphasis is placed on Romanticism and Realism and their legacies in contemporary culture.

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:

El estudiante de Salamanca, José de Espronceda (1837), Don Juan Tenorio, José Zorrilla (1844), Rimas, Gustavo Adolfo Bécquer (1871), En las orillas del Sar, Rosalía de Castro (1884), Pepita Jiménez, Juan Varela (1874), other public domain texts the Biblioteca Virtual Miguel de Cervantes. These readings will be complemented by peer-reviewed scholarship on these texts and the literature of the period generally.

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

Zachary Rockwell Ludington, Assistant Professor of Spanish, 3 courses/semester

Reason for new course:

The graduate catalog for Spanish is very sparse, and the faculty is embarking on the process of adding courses, often already offered numerous times in the past, to curtail the trend of offering an overabundance of Topics courses. This course is being proposed concurrently with SPA 419: Rebels & Realists in 19C Literature; they will run together in combined sections. Currently no graduate courses in the catalog focus on modern Peninsular literature. This course will begin to remedy that gap.

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.

NA

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?

Alternating fall semesters. No.

**SECTION 2 (FOR COURSE MODIFICATIONS)**

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

NA

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

To be cross-listed with SPA 419 Rebels & Realists in 19C Literature

Reason for course modification:

To populate the excessively sparse graduate catalog and align the upper-level undergraduate courses with the corresponding graduate courses

**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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.



### **SPAN 419/519: Rebels & Realists in 19C Literature**

Profesor: Z.R. Ludington      E-mail: zachary.r.ludington@maine.edu  
Otoño 2021                      Consulta: TBD  
Despacho: 262 Little Hall      Clase: TBD

**Course description:** This course analyzes a broad selection of literary texts from the 19th century, a period of revolutions, rapid industrialization, and radical politics. A particular emphasis is placed on Romanticism and Realism and their legacies in contemporary culture.

**Prerequisites:** SPA 307 or SPA 308

**Credits:** 3

**Course outcomes:**

As outgrowths of the course's focus on nineteenth-century literature, students will develop several skills of broad reach:

- the ability to examine historical texts of creative expression from the Hispanic world and situate them within the broad historical phenomena, diverse cultural traditions, and social structures of the Western Cultural Tradition;
- the ability to comment meaningfully on the complex intellectual history of the west, especially in industrial, globalized societies;
- the ability to generate, challenge, and negotiate original ideas related to language, art, and culture in the past and present;
- the ability to deploy a critical vocabulary for the evaluation and analysis of works of art;
- improved writing and reading skills developed through focused writing tasks, including research;
- increased proficiency in Spanish through challenging reading, writing, and discussion tasks.

**A note for graduate students:** Students enrolled in this course at the graduate level (519) will have different expectations from those of the undergraduate students. In addition to the readings assigned to all students, graduate students will have further reading indicated on the syllabus in the form of peer-reviewed scholarship on the texts and themes treated in class. Additionally, the essay assignments for graduate students will demand more extensive writing and much more engagement with scholarly work as indicated on the corresponding rubrics.

**Important Information for all UMaine courses:**

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*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/>

### **University of Maine COVID-19 Syllabus Statement [to remain as needed]**

COVID-19 is an infectious disease caused by the coronavirus SARS-CoV-2. The virus is transmitted person-to-person through respiratory droplets that are expelled when breathing, talking, eating, coughing, or sneezing. Additionally, the virus is stable on surfaces and can be transmitted when someone touches a contaminated surface and transfers the virus to their nose or mouth. When someone becomes infected with COVID-19 they may either have no symptoms or symptoms that range from mild to severe and can even be fatal. During this global pandemic, it is imperative that all students, faculty, and staff abide by the safety protocols and guidelines set forth by the University to ensure the safety of our campus. All students are encouraged to make the Black Bear Cares Pact to protect the health of themselves, the health of others, and the College of Our Hearts Always.

**Black Bears Care Pact:** <https://umaine.edu/return/black-bears-care/>

**Symptom checking:** The symptoms of COVID-19 can range from mild to severe, and even people with mild symptoms may transmit the virus to others. Students are encouraged to use the symptom checking app each day before attending class or moving about campus and follow the recommendation prompted within the app. Students should monitor for the following symptoms daily: fever (temperature >100.4F/38.0C) or chills, new cough, loss of taste or smell, shortness of breath/difficult breathing, sore throat, diarrhea, nausea, or vomiting, or the onset of new, otherwise unexplained symptoms such as headache, muscle or body aches, fatigue, or congestion/runny nose.

**Physical distancing:** Students need to make every effort to maintain physical distancing (6 feet or more) indoors and outdoors including within classrooms. The University classrooms and physical spaces have been arranged to maximize physical distancing. Follow the traffic patterns outlined in each building and outdoor space to avoid crowding. If students are in an academic setting (i.e. clinical or lab class) that requires them to reduce physical distancing, they should follow the instructor's guidelines.

**Face coverings:** Students must wear appropriate face coverings in the classroom. Face coverings must be worn in indoor and outdoor spaces on campus unless people are alone in a room with a door closed or when they are properly physically distanced and do not expect someone to approach them. When face coverings are removed people are placing themselves and those surrounding them at increased risk for COVID-19.

**Eating and drinking in classrooms:** Students may not eat or drink in the classrooms and are encouraged to take their food or drink into areas designated for these purposes where they can maintain 6 feet physical distance from others.

**Hand hygiene:** Proper hand hygiene is an effective measure to prevent the spread of COVID-19. Students should wash their hands often with soap and water or use a hand sanitizer with at least 60% alcohol, especially after using the bathroom, before eating or drinking, and before and after going to class or university spaces such as the recreation center, library, or dining halls.

**Contingency plans:** Classes will be held in various formats to offer flexibility, compassion, and empathy during these unprecedented times. Under certain circumstances, students or instructors may need to miss classes or in-person classes may be disrupted. Students are expected to notify their instructor if they are unable to attend an in-person or online class but will not be penalized for missing class due to illness or the need to care for a family member affected by COVID-19. If a disruption occurs, your instructor will provide communication and contingency plans.

**What to do if you have or suspect you have COVID-19:** If you have symptoms of COVID-19 or have been possibly exposed to someone with COVID-19, you should stay home, not interact with others, and contact your health care provider immediately to be tested for COVID-19. You may not attend in-person classes and should suspend interactions with others until you are tested. Prior to receiving test results you should quarantine in your living area according to the Maine CDC guidelines below. Please follow the guidance of your health care professional regarding testing, quarantine, and isolation during the testing process and potential illness period.

**What to do if someone you know has or may have COVID-19:** If someone you know or that you have had close contact with (defined by the ME CDC as 15 mins or more within 6 feet or less) has tested positive for COVID-19, you should stay home and quarantine according to the guidance of the ME CDC, contact your health care provider, and continue to monitor for

symptoms. You may be required to quarantine and/or be tested for COVID-19 under these circumstances. You may also have been exposed to COVID-19 by someone you do not know, and it is possible that you could be contacted through contact tracing to determine if you were exposed. Everyone should respond to these confidential questions to ensure the safety of themselves and those around them.

**Maine CDC guidelines:** <https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/airborne/coronavirus/general-information.shtml>

If you have questions or would like additional information related to the University of Maine COVID-19-specific policies or procedures please use the following sources:

**University Webpages:** [umaine.edu/return](http://umaine.edu/return) and [together.maine.edu](http://together.maine.edu)

**COVID-19 Information line:** 207.581.2681

**Emergency Operations Center Email Contact:** [umaine.alerts@maine.edu](mailto:umaine.alerts@maine.edu)

<b>Grade components:</b>	
20%	Participation (2)
15%	Terminology and concept quizzes (2)
15%	Presentation
20%	First paper (800-1000 words; grad 1000-1500)
30%	Final paper (2000-2500 words; grad 2500-3500)

### **Participation**

Your participation will be assessed at two points in the semester: mid-term and the end. For each, you will rate your own engagement in class using **a form on Brightspace**. I will weigh in as well, and you'll receive a score based on the combined assessment.

### **Terminology and concept quizzes**

Two short quizzes will keep you accountable for important terminology and concepts related to the literature we study and its historical context. These items will be marked with an asterisk (\*) in my Powerpoint presentations and covered in class.

### **Presentation**

The two main aesthetic categories we cover in this class are Romanticism and Realism, movements or perhaps styles in syntony with key artistic, social, and political concerns of the nineteenth century. Their long legacy continues with us today. Your task in this short presentation (10 to 15 minutes) to the class is to juxtapose one work of literature from the semester with a contemporary work of art (song, film, TV series, book, poem, etc.) and trace continuities from nineteenth-century culture, especially Romanticism and Realism, to twenty-first-century culture. 519 students: your presentation is expected to include deep engagement with scholarship on the subject. **Rubrics will be posted to Brightspace.**

### **Papers**

The first short paper will be a close reading of one of the Romantic works we treat in the first weeks of the semester. Choose one work and dig into it, take it apart, see how it operates. Pay close attention to the terminology and concepts from quiz 1, likely of utility to you in your analysis of the text. For 419 students, no deep engagement with scholarship is expected, but 519 students should bring peer-reviewed research to bear on their analysis. **Rubrics will be posted to Brightspace.**

The second and final paper will be a research-informed analysis of one of two possible topics. You may choose 1) to perform a second close reading on one of the Realist works we cover in the later weeks of the semester or 2) to perform a research-rich synthesis of the concepts "Romanticism" and "Realism." For either choice, engagement with peer-reviewed research is expected and should be extensive for 519 students. **Rubrics will be posted to Brightspace.**

### **Grade scale**

A = 94 – 100  
A- = 90 – 93  
B+ = 87 – 89  
B = 84 – 86  
B- = 80 – 83  
C+ = 77 – 79  
C = 74 – 76  
C- = 70 – 73  
D+ = 67 – 69  
D = 64 – 66  
D- = 60 – 63  
F = lower than 60

### **Course materials**

All materials for this course will be posted as PDFs to Brightspace and/or are available in the public domain. However, while available in the Biblioteca Virtual Miguel de Cervantes, these longer texts listed below are often best read on paper and in critical editions, of which many exist:



*El estudiante de Salamanca*, José de Espronceda (1837)

*Don Juan Tenorio*, José Zorrilla (1844)

*Rimas*, Gustavo Adolfo Bécquer (1871)

*En las orillas del Sar*, Rosalía de Castro (1884)

*Pepita Jiménez*, Juan Varela (1874)

Additional shorter texts from the Biblioteca Virtual Miguel de Cervantes (poems, articles, or short stories by Juan Meléndez Valdés, Mariano José de Larra, Gertrudis Gómez de Avellaneda, Benito Pérez Galdós, Emilia Pardo Bazán, will be posted to Brightspace in PDF format)

### Programa de lecturas y tareas

Semana 1	Meléndez Valdés, poesía selecta; (519: leer a Gómez Castellano)
Tema de la clase	Breve historia político-social del siglo XIX en España
Semana 2	Larra, "Nochebuena de 1836"; (519: leer a García Tejera)
	La Ilustración decepcionada
Semana 3	Espronceda, poemas líricos; <i>El estudiante de Salamanca</i> (1-3)
	El romanticismo poético
Semana 4	Espronceda, <i>El estudiante de Salamanca</i> (4); (519: leer a Scarlett)
<b>Prueba 1</b>	El romanticismo diabólico
Semana 5	Zorrilla, <i>Don Juan Tenorio</i> (I)
<b>Participación 1</b>	El romanticismo popular
Semana 6	Zorrilla, <i>Don Juan Tenorio</i> (II); Gies, "Don Juan contra Don Juan"
<b>Se entrega ensayo 1</b>	El romanticismo, la rebeldía, la recepción

Semana 7	Gómez de Avellaneda, poesía selecta; Kirkpatrick, selecciones
	El romanticismo tardío (y político)
Semana 8	Bécquer, <i>Rimas</i> ; (519: leer a Sebold)
	El romanticismo tardío (y esteticista)
Semana 9	Galdós, "La novela en el tranvía"; (519: leer a García Osuna)
	El realismo literario
Semana 10	Valera, <i>Pepita Jiménez</i> (I)
	El realismo (realista pero alegórico)
Semana 11	Valera, <i>Pepita Jiménez</i> (II y III); (519: leer a Whiston)
<b>Prueba 2</b>	El realismo (alegoría y compromiso social)
Semana 12	Rosalía de Castro, <i>En las orillas del Sar</i> (selecciones)
	El romanticismo (muy) tardío, el artista genial
Semana 13	Pardo Bazán, "La cruz roja"; (519: leer a González Herrán)
<b>Participación 2</b>	El realismo y la perspectiva irónica moderna; <b><u>Presentaciones</u></b>
Semana 14	No hay lectura
	<b><u>Presentaciones; taller del ensayo 2</u></b>



### NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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GRADUATE PROGRAM/UNIT SCIS

COURSE DESIGNATOR COS COURSE NUMBER 565 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Data Visualization

#### 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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

#### **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)**

**Penny L Rheingans** Digitally signed by Penny L Rheingans  
Date: 2021.04.27 18:06:09 -04'00'

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

**Thane Fremouw** Digitally signed by Thane Fremouw  
Date: 2021.04.15 09:59:27 -04'00'

College Dean(s)

*Timothy M. Cole*

*04, 14, 2021*

**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):

**COS 565 – Data Visualization**

Introduction to the goals, techniques, implementation and evaluation of visual representations for large quantities of data. Students work with a team to produce a novel visualization solution for a client with application domain data and goals.  
Prerequisites & Notes: COS 226 or permission of instructor.

Credits: 3

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

**COS 565 – Data Visualization**

Introduction to the goals, techniques, implementation and evaluation of visual representations for large quantities of data. Students work with a team to produce a novel visualization solution for a client with application domain data and goals.  
Prerequisites & Notes: COS 226, or SIE 508, or permission of instructor.

Credits: 3

Reason for course modification:

In order to better align with course backgrounds of DSE students.

**SECTION 3 FOR COURSE ELIMINATIONS**

Reason for Elimination

[Empty box for 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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.



**NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES**

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GRADUATE PROGRAM/UNIT Curriculum, Assessment, and Instruction - COEHD

COURSE DESIGNATOR EHD COURSE NUMBER 586 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE EHD 586- Seminar: Action Research in PreK-12 Schools

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)**

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

3/17/2021

**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):

Introduces action research principles and methods for PreK-12 schools, including reviewing professional literature on educational practice. Focus on collaboration among schools, families, and communities, and on professional learning and ethical practice. Begin development of an action research plan for a question of educational practice of the student' s choice. Satisfies seminar requirement.

3 Credits

Prerequisites & Notes

EHD 520, EHD 521 and EHD 533, or instructor permission.

15 credits of graduate coursework in Education recommended.

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

Introduces action research principles and methods for PreK-12 schools, including reviewing professional literature on educational practice. Focus on collaboration among schools, families, and communities, and on professional learning and ethical practice. Begin development of an action research plan for a question of educational practice of the student' s choice. Satisfies seminar requirement.

3 Credits

Prerequisites & Notes

EHD 519, EHD 521 and EHD 533, or instructor permission.

Reason for course modification:

EHD520 is no longer taught in the MEd/CAS for Curriculum, Assessment, and Instruction. It was replaced by EHD519, which covers similar content.

**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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.



# NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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GRADUATE PROGRAM/UNIT Mechanical Engineering

COURSE DESIGNATOR MEE COURSE NUMBER 554 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Theory of Elasticity

### 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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) Conversion of existing on-site Course to an online Course
- Title Change
- Credit Change

### **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: 2021.04.08 10:48:47 -04'00'

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

Mohamad Musavi Digitally signed by Mohamad Musavi  
DN: cn=Mohamad Musavi, o=University of Maine, ou=College of Engineering, email=musavi@maine.edu, c=US  
Date: 2021.04.19 14:11:16 -04'00'

College Dean(s)

Dana N Humphrey Digitally signed by Dana N Humphrey  
Date: 2021.04.19 15:48:38 -04'00'

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):

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

Reason for course modification:

The proposed change will provide flexibility in teaching this course in person one year and online or hybrid in another year. The ability to teach this course online or in hybrid modality would accommodate working professionals interested in taking a graduate course and/or pursuing a graduate degree in MEE.

**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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.





**NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES**

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GRADUATE PROGRAM/UNIT Mechanical Engineering  
COURSE DESIGNATOR MEE COURSE NUMBER 562 EFFECTIVE SEMESTER Fall 2021  
COURSE TITLE Advanced Fluid Mechanics

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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: 2021.03.01 10:11:59 -05'00'

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

**Mohamad Musavi** Digitally signed by Mohamad Musavi  
Date: 2021.03.02 09:50:52 -05'00'

**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):

MEE 562 Advanced Fluid Mechanics Development of the differential and integral equations of mass, momentum, and energy conservation for viscous fluids and application of these to internal, external, and boundary layer flows of incompressible, viscous fluids.

Prerequisites MEE 360

3 credits

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

This course is designed to provide in-depth understanding of the fundamentals in fluid mechanics at the introductory graduate level. It starts with formal derivation of unsteady three-dimensional Navier Stokes equations in both integral and differential forms. Exact solutions of viscous incompressible flow will then be derived for classic flow configurations, including Couette flow, Poiseuille flow, duct flow with different shapes of cross-sections, flow between rotating cylinders, Stokes' first problem, Stokes' Second Problem and Stagnation-Point Flow. The boundary layer theory will be introduced, including the derivation of boundary layer equation, Karman-Pohlhausen Approximation, Blasius solution, Falkner-Skan Solutions and boundary layer separation. Potential flow theory will be introduced, including supposition of fundamental solutions, complex velocity potential, conformal transformation, Joukowski transformation, and Panel techniques. The course will be finished with a brief introduction to hydrodynamic instability and turbulence. Prerequisites MEE 360  
3 credits

Reason for course modification:

The description is very brief and general. It lacks sufficient information and does not reflect the actual contents in a clear manner.

## **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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.



**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 graduate@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

GRADUATE PROGRAM/UNIT SFA

COURSE DESIGNATOR PSE COURSE NUMBER 581 EFFECTIVE SEMESTER F2021

COURSE TITLE Scientific Communications II

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)

Robert Causey

Digitally signed by Robert Causey  
Date: 2021.04.01 22:02:44 -04'00'

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

College Dean(s)

Christopher Gerbi

Digitally signed by Christopher Gerbi  
Date: 2021.04.15 08:51:17 -04'00'

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):

PSE 581 - Scientific Communications II  
Literature review and poster presentation of scientific ecological and environmental research topics.

Prerequisites & Notes  
permission.

Credits: 1

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

PSE 581 - Scientific Communications II  
Literature review and poster presentation of scientific ecological and environmental research topics.

Prerequisites & Notes

Credits: 1

Reason for course modification:

This is a course which all MS PSE and MS Horticulture students take so that it removes this extra step which is not needed.

**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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.



**NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES**

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GRADUATE PROGRAM/UNIT School of Computing and Information Science

COURSE DESIGNATOR SIE COURSE NUMBER 507 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Information Systems Programming

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)**

Penny L Rheingans Digitally signed by Penny L Rheingans  
Date: 2021.04.27 18:07:25 -04'00'

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

Thane Fremouw Digitally signed by Thane Fremouw  
Date: 2021.04.15 10:08:35 -04'00'

College Dean(s)

*Tracy M. Cole*

04.14.2021

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):

Prerequisites & Notes: Graduate standing.

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

Prerequisites: Graduate standing or permission.

Reason for course modification:

**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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.



### NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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GRADUATE PROGRAM/UNIT Spatial Information Science and Engineering / SCIS

COURSE DESIGNATOR SIE COURSE NUMBER 515 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Human Computer Interaction

#### 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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

#### 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)

Penny L Rheingans Digitally signed by Penny L Rheingans  
Date: 2021.04.27 18:06:54 -04'00'

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

Thane Fremouw Digitally signed by Thane Fremouw  
Date: 2021.04.15 10:04:13 -04'00'

College Dean(s)

Timothy M. Cole 04, 14, 2021

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):

SIE 515 Human Computer Interaction  
Students are introduced to the fundamental theories and concepts of human-computer interaction (HCI). Topics covered include: interface design and evaluation, usability and universal design, multimodal interfaces (touch, gesture, natural language), virtual reality, and spatial displays.  
Prerequisites & Notes: none  
Credits: 3

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

SIE 515 Human Computer Interaction  
Students are introduced to the fundamental theories and concepts of human-computer interaction (HCI). Topics covered include: interface design and evaluation, usability and universal design, multimodal interfaces (touch, gesture, natural language), virtual reality, and spatial displays.  
Prerequisites & Notes: graduate standing or permission  
Credits: 3

Reason for course modification:

Change prerequisite to "graduate standing or permission."

**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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.





**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 graduate@maine.edu. Please include in the subject line 'Course Proposal' and the course designator and number.

GRADUATE PROGRAM/UNIT School of Computing and Information Science

COURSE DESIGNATOR SIE COURSE NUMBER 554 EFFECTIVE SEMESTER Fall 2021

COURSE TITLE Spatial Reasoning

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)

**Penny L Rheingans** Digitally signed by Penny L Rheingans  
Date: 2021.04.27 18:07:58 -04'00'

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

**Thane Fremouw** Digitally signed by Thane Fremouw  
Date: 2021.04.15 10:09:39 -04'00'

College Dean(s)

*Trudy M. Cole*

*04, 14, 2021*

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):

### SIE 554 Spatial Reasoning

Qualitative representations of geographic space. Formalisms for topological, directional and metric relations; inference mechanisms to derive composition tables; geometric representations of natural language-like spatial predicates; formalizations of advanced cognitively motivated spatial concepts, such as image schemata; construction of relation algebras. Analysis of relation algebras a new advanced focus.

Prerequisites & Notes SIE 451 or SIE 550. Credit: 1 or 3

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

### SIE 554 Spatial Reasoning

Qualitative representations of geographic space. Formalisms for topological, directional and metric relations; inference mechanisms to derive composition tables; geometric representations of natural language-like spatial predicates; formalizations of advanced cognitively motivated spatial concepts, such as image schemata; construction and analysis of relation algebras.

Prerequisites & Notes graduate standing

Credit: 3

Reason for course modification:

prerequisites: SIE 451 does not exist anymore, SIE 550 not required for SIE 554  
changed to graduate standing

Credit: eliminated the option to take 1/3 of the course for 1 credit

## 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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.



NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM
for Graduate Courses

GRADUATE PROGRAM/UNIT Social Work
CURRENT COURSE DESIGNATOR SWK CURRENT COURSE NUMBER 571
EFFECTIVE SEMESTER Fall 2021
TITLE Trauma: Theory, Assessment and Treatment

REQUESTED ACTION:

NOTE: A complete syllabus is required for all new courses and for the addition of an electronic learning component 1 to an existing course.

NEW COURSE (check all that apply and complete Section 1):

- New Course
New Course with Electronic Learning 1
Experimental

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

- Designator Change Prerequisite Change Other (specify)
Number Change Credit Change
Title Change Cross Listing (must be at least 400-level) 2
Description Change Addition of Electronic Learning Component 1

ELIMINATION:

- Course Elimination

ENDORSEMENTS (Print name) Date Sign Initials

Leader, Initiating Department/Unit(s) Sandra S. Butler 2-25-21 AAB

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

College Dean(s) Christopher Gerbi 9 Mar 2021 CCG

Dean and Associate Provost for Graduate Studies

1. If a course involves significant electronic access for the primary delivery of its content (more than 50%), the course proposal should specify faculty training/experience in use of technology and how the electronic delivery will be managed. Please consult with the Office of Distance Education for more information.
2. Courses cross-listed below 400-level require the permission of the Dean and Associate Provost for Graduate Education.

## **SECTION 2 (FOR COURSE MODIFICATIONS):**

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

**SWK 571 - Trauma: Theory, Assessment and Treatment**

Explains current research and controversies in the areas of psychobiology of trauma, memory, dissociation, developmental impacts, diagnosis and treatment.

Prerequisites & Notes

MSW student or Permission

Credits: 3

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

**SWK 571 - Trauma Theory and Treatment in Social Work Practice**

Explains current research and controversies in the areas of psychobiology of trauma, memory, dissociation, developmental impacts, diagnosis and treatment.

Prerequisites & Notes

MSW student or Permission

Credits: 3

**Reason** for course modification:

Title more clearly describes what is covered in the course.

The course has been taught in-person since its inception. The School and the instructor believe it is time to offer it as an synchronous online course so as to have it more accessible to our online-blended program MSW students and degree and non-degree students that live all over the state.

The instructor (Dr. Jennie Goldenberg) has been providing clinical services via Zoom technology for a year and is very comfortable with the technology.

## **SECTION 3 FOR COURSE ELIMINATIONS:**

**Reason** for Elimination

**UNIVERSITY OF MAINE  
SCHOOL OF SOCIAL WORK**

**SWK 571:  
TRAUMA THEORY AND TREATMENT IN SOCIAL WORK  
PRACTICE**

**Instructor:** Jennifer Goldenberg, Ph.D., LCSW  
**Contact Info:** 207-907-9267  
jenniegoldenberg@gmail.com

Wednesday, 4:00-6:30  
Synchronous online (zoom)  
**Office Hours:** By appointment

**SYLLABUS**

**COURSE OVERVIEW**

In this course we will survey the history of the development of trauma theory, as well as the neurobiology of trauma. The concept of resilience and its mechanisms will also be explored. Students will consider various forms of trauma, with particular emphases on developmental and complex trauma and their long-term effects, as well as the traumatic sequelae of war, ethnic conflict, and historical trauma. Trauma diagnoses and comorbidity will be considered, including posttraumatic stress disorder (PTSD), complex PTSD, borderline personality disorder, and the dissociative disorders, but complex PTSD in adult survivors will be the major focus. Social work's strengths-based perspective will be heavily emphasized throughout. Various long-term impacts, including dissociative processes and substance use disorders, will be viewed as posttraumatic adaptation, and students will have a beginning understanding of how to distinguish between the adaptive and pathological accommodations survivors have been required to make, and recognize the strength in survival.

Using the extensive readings, as well as case studies, film clips, and DVDs of leading theorists, researchers, and clinicians in the field, students will have a beginning understanding of the impact of trauma on individuals, and the intergenerational transmission of both trauma and resilience within families. We will examine a range of traumatic experiences and their differential impact based on race, ethnicity, gender, sexual orientation, and membership in oppressed groups, paying careful attention to the importance of cultural competence in clinical work with trauma survivors. We will explore the stages of recovery, the phases of treatment for complex trauma, and touch on various treatment modalities, including Mindfulness-based interventions, EMDR,

Prolonged Exposure Therapy, Sensorimotor Psychotherapy, Internal Family Systems Therapy, and Narrative Therapy. The emphasis regarding trauma treatment will be focused on a phase-model, relationship-based, psychodynamic approach. The critical importance of the therapeutic relationship in trauma treatment will be emphasized throughout the course, as will the importance of culturally competent practice.

Other topics we will discuss include: the power of shame and guilt; suicidality, the conspiracy of silence on familial, societal, and global levels regarding the extent of trauma; forgiveness and reconciliation; working within systems and the concept of “sanctuary trauma”, developing resources and anchors in therapy; the role of transference and counter-transference in trauma therapy; and the very real risks to the helper of vicarious traumatization, as well as ways to mitigate its impact. There will be a strong emphasis on the importance of self-care throughout the course.

## EDUCATIONAL OUTCOMES

At the completion of the course students will have *a beginning ability* to:

1. Identify trauma in its various forms, as well as its long-term effects;
2. Understand the history and development of trauma theory as well as the concept of resilience;
3. Identify internal and external risk and protective factors in an individual’s recovery from trauma and identify individual strengths;
4. Have a beginning understanding of various treatment approaches;
5. Begin to understand how to monitor and recognize the role of transference, counter-transference, and re-enactment in the treatment of trauma survivors;
6. Understand the impact of discrimination on oppressed groups as chronic trauma;
7. Learn how to “help the helper,” or mitigate vicarious traumatization;
8. Begin to understand the intergenerational impact of both trauma and resilience.

## TECHNOLOGY EXPECTATIONS

This is an online, synchronous class that will be taught via Zoom each Wednesday from 4:00 to 6:30 pm. While attending class sessions, students will need to be in a place with adequate broadband to use Zoom audio and video technology. If not in a private setting, earphones should be used. Due to the nature of the course material, students will benefit from being in a private location, if that is possible.

This course uses the learning management system, Brightspace. Class readings and assignments are organized by weeks under the Content tab. Weekly reading questions and all assignments should be submitted through Brightspace.

**If you have technical difficulties, please contact UMaineOnline**

E-mail technical questions to us at [umaineonline@maine.edu](mailto:umaineonline@maine.edu)

Toll Free: 1-877-947-4357

Local: (207) 581-4591

Office Hours: 8AM to 6PM, Monday-Thursday

8AM to 5PM, Friday

## COURSE CAVEATS

This is an intensive and demanding course with a great deal of difficult and sometimes graphic reading material, film, and documentary content. We will be processing this material on a weekly basis, but if at any time the coursework becomes overwhelming to you, please contact me ASAP either by phone or email. It is challenging and often quite painful to deal with trauma. It sometimes taps into our own past individual histories. However, this class is not a forum for discussion of students' personal traumatic experiences. Time will be allotted weekly through class discussion and reflection papers to individual impressions of the readings and discussions. Within the classroom, there will be an emphasis on creating a safe atmosphere, including respect for diverse perspectives and experiences, confidentiality, and thoughtful pacing of the traumatic material.

## REQUIRED TEXTS:

Courtois, C. A., & Ford, J. D. (2013). *Treatment of complex trauma: A sequenced, relationship-based approach*. New York: The Guilford Press.

Herman, J. (1997). *Trauma and recovery*. New York: Basic Books.

Hollander-Goldfein, B., Isserman, N., and Goldenberg, J. (2012). *Transcending trauma: Survival, resilience, and clinical implications in survivor families*. New York: Routledge.

Van der Kolk, B. (2014). *The body keeps the score*. New York: Viking.

## RECOMMENDED TEXTS:

Emerson, D. (2015). *Trauma-sensitive yoga in therapy*. New York: W.W. Norton & Co.

Silberg, J. (2012). *The child survivor*. New York: Routledge.

**All other required readings will be found on Brightspace course site**

## COURSE SCHEDULE

### PART ONE: TRAUMA THEORY AND TRAUMA'S LONG-TERM EFFECTS

#### WEEK 1: Introduction to the Course

Class introductions, syllabus, expectations for the course, the importance of the strengths perspective in working with trauma survivors, discussion of personal strengths, internal and external risk and protective factors, coping strategies and resources, handling traumatic content, mindfulness-based techniques, including attention to the breath, and relaxation techniques for self-care. Definitions of trauma and definitions of safety.

**Case Study:** Charlotte: Identifying internal and external risk and protective factors.

**Film Clip:** "You can't handle this."

#### WEEK 2: History of Trauma Theory and the Concept of Resilience

A history of trauma theory, and the current state of the field of resilience theory. A brief introduction to narrative therapy.

**Case Study:** Alicia (*Transcending Trauma*, p. 81). We will go over this case study in class, as well as the story of Danielle (*Transcending Trauma*, p. 80). We will discuss stories of strength and analyze the case studies using a strengths perspective, and a narrative therapy approach.

**Readings:** Try to do the readings for the course in the order I have them listed each week, so that they will make the most sense:

*Trauma and recovery*, 1-73.

*Transcending trauma*, pp. 3-35.

Masson, J. (2017). A personal perspective: The response to child abuse then and now. *Journal of Trauma & Dissociation*, 18(3), 476-482.

#### WEEK 3: Intro to Developmental and Complex Trauma, PTSD and C-PTSD

Developmental trauma and its societal context. Adverse Childhood Experiences Study.



Overview of PTSD; differentiating stress, traumatic stress, PTS, and PTSD; development, memory, and the brain; implicit and explicit memory; state-dependent recall; somatic memory; the somatic nervous system. Autonomic nervous system (ANS) and parasympathetic nervous system (PNS). The avoidance/flooding dynamic of PTSD.

**Case Study:** Danielle (*Transcending Trauma* p. 80). Charlotte Case study. Review with ACE's in mind. Mindfulness- based stress reduction techniques.

**Readings:**

<https://www.cdc.gov/violenceprevention/childabuseandneglect/cestudy/index.html>

**TED Talk**

<https://www.youtube.com/watch?v=95ovIJ3dsNk>

**Readings:**

*Trauma and Recovery*, pp. 115-129.

*The Body Keeps the Score*, pp. 1-87.

#### **WEEK 4: Developmental and Complex Trauma (continued): The Body Remembers**

Discussion of developmental trauma, complex traumatic stress disorders and their definitions; trauma, attachment, and the development of the self; the survival brain and the learning brain; emotion dysregulation; dysregulated information processing; disorganized attachment, borderline personality disorder; the role of trauma in addictions.

**Case Study:** Sandra, Gary

*Trauma and Recovery*, pp. 96-114.

*The Body Keeps the Score*, pp. 105-149

*Treatment of Complex Trauma*, pp. viii-50.

Simon, R. and Dockett, L. (2017) The Addict in All of Us: Gabor Mate's Unflinching Vision. *Psychotherapy Networker*, July/August.

<https://www.psychotherapynetworker.org/magazine/article/1102/the-addict-in-all-of-us>

#### **WEEK 5: The Dissociative Disorders: Trauma Not Yet Remembered**

**RESEARCH PAPER PROPOSALS DUE. MIDTERM HANDED OUT.**

The phenomenon of dissociation; the history of a diagnosis; traumatic dissociation and traumatic flashbacks; the BASK Model of dissociation, the SIBAM model; the neurobiology of traumatic amnesia.

The DES Scale (In Class)

**Readings:**

Courtois & Ford, 145-165; 235-268.

*Body Keeps the Score*, pp.171-202

**Documentary:** Angel

**WEEK 6: NO CLASS DUE TO MY OBSERVANCE OF YOM KIPPUR. WORK ON YOUR MIDTERM EXAMS. [This may be placed elsewhere, depending on the year and when Jewish high holidays fall.]**

**WEEK 7: The Child Survivor****MIDTERM PAPERS DUE.**

The traumatized and dissociative child; Silberg's integrative developmental model of treatment, diagnostic considerations regarding traumatized children, treating the dissociative child; children surviving disasters, trauma-focused cognitive behavioral therapy (TF-CBT).

**Readings:** Silberg, J. (2012) *The child survivor* (pp. 28-51).

SAMHSA (September, 2018). *Behavioral Health Conditions in Children and Youth Exposed to Natural Disasters*.

Video: Children, violence, and trauma: Treatments that work.

<https://www.youtube.com/watch?v=3EyvaEk0K-k>

**TF-CBT**

<https://www.youtube.com/watch?v=axisButKQYCY>

**FILM: Girlhood (to be shown in class and discussed).**

### **WEEK 8: War Trauma**

The impact of war on the warriors: Vietnam, Iraq and Afghanistan.

#### **Readings:**

O'Brien, "The Things they Carried," Chapter 1

Explore this website and be prepared to discuss:

[www.ptsd.va.gov](http://www.ptsd.va.gov)

**Guest Speaker:** Vietnam Veteran living with PTSD.

### **Week 9: Genocide and Ethnic Conflict**

The Holocaust and other genocidal conflicts; the importance of studying global conflict and its long-term impacts and relevance to other trauma survivors. Pre-trauma coping strategies and their posttraumatic impact; intro to the search for meaning after trauma.

**Readings:** *Transcending Trauma*, pp. 51-109.

Park, M. and Katsiaficas, C. (2019). *Mitigating the effects of trauma among young children of immigrants and refugees*. Migration Policy Institute.

Schall, S., & Elbert, T. (2006). Ten years after the genocide: Trauma confrontation and posttraumatic stress in Rwandan adolescents. *Journal of Traumatic Stress, 19 (1)*, pp. 95-105.

Sarah (Holocaust survivor) interview excerpts (in class)

**Documentary:** The Last Days

**First Reflection paper due on war trauma and genocide and its effects.**

### **Week 10: The Intergenerational Transmission of Trauma and Resilience in Survivor Families**

The role of communication in survivor families. The intergenerational transmission of trauma and resilience. Special topics: forgiveness and reconciliation: Is it necessary for recovery from trauma? The role of faith in coping with trauma; the clinician's discomfort with clients' faith systems. Intergenerational trauma in Native families.

Rita (child of survivor) interview excerpts (in class)

In-class Exercises: Adolescent coping strategies; Pivotal Narratives; The Shawl

**Readings:** *Transcending Trauma*, pp. 133-149; 201-234.

Pember, M.A. (2016). *Intergenerational trauma: Understanding natives' inherited pain*. Indian Country Media Network.

<https://www.youtube.com/watch?v=KLSkMmZojTU>

**Film recommendation:** Rabbit Proof Fence (True story of boarding schools, and indigenous children being taken from their families in Australia)

## **PART TWO: INTRODUCTION TO TRAUMA TREATMENT**

### **Week 11: The Stages of Recovery and the Phases of Treatment. Cultural Competence in Trauma Treatment**

Introduction to trauma treatment: The primary importance of safety and stabilization; building a working alliance, reconstruction of the traumatic narrative; trauma processing, reconnection and meaning; phase-oriented treatment for Complex PTSD. The importance of cultural competence in treatment; residual effects of slavery in African-American families.

Grounding techniques (handout)

#### **Readings:**

Herman, pp. 155-236

Courtois and Ford, pp. 53-87

Wilkins, E.J., Whiting, J.B., Watson, M.F., Russon, J.M., Moncrief, A.M. (2013): Residual effects of slavery: What clinicians need to know. *Contemporary Family Therapy* 35,14-28.

**Resourcing:** <https://www.youtube.com/watch?v=2CfJaRgjUWg>

**Write reflection paper#2 on readings and video for this week.**

### **WEEK 12: The Therapeutic Relationship: The Heart of Change/Selected Treatment Approaches**

The primary importance of the therapeutic relationship; transference and counter-transference, and the intensity of these in working with complex trauma survivors; boundary-setting; the context of the therapeutic relationship; working within systems; the concept of “sanctuary trauma;” Sandra Bloom’s Sanctuary Model; conspiracy of silence; vicarious traumatization, compassion fatigue, and burnout, and ways to mitigate it.

**Readings:** Courtois & Ford, pp. 269-327.

Esaki, N., et al. (2013). The Sanctuary Model: Theoretical framework. *Families in Society, 94*(2), 87-95.

### **WEEK 13: THANKSGIVING BREAK. NO CLASS**

### **WEEK 14: Selected Treatment Approaches**

Introduction to several selected treatment approaches for trauma, including: mindfulness-based interventions, psychodynamic, prolonged exposure therapy, EMDR, IFS, DBT, and Sensorimotor Psychotherapy.

#### **Readings:**

*Body keeps the score*, pp. 248-277.

Richard Schwartz, Internal Family Systems Therapy:  
<https://www.youtube.com/watch?v=2UfmGwENz9M>

#### **IN CLASS:**

Richard Schwartz, Guided Meditation: Getting to know your Protector.

<https://www.youtube.com/watch?v=56Px9qaxAkY>

### **WEEK 15: Trauma Treatment Approaches (continued) and Wrap-Up.**

#### **PAPERS DUE TO BE PRESENTED.**

Final papers due

### **REQUIREMENTS AND GRADING**

**Class Participation:** There will be a great deal of lecture format in this course, but I also encourage students to participate in the discussion as much as possible. I realize that not everyone is comfortable speaking in class. However, because of the amount of reading for this course, your participation will help me assess how well you are keeping up with the class. **I expect each student to post at least one question or substantive issue based on the week's readings before each class, with appropriate APA citations. Weekly and consistent verbal participation will count as extra credit for the course.**

**Reflection Papers:** There will be two reflection papers spaced throughout the semester, based on topics discussed during the course. Papers should be 3-4 pages, with references cited appropriately in APA format. Papers will be returned ungraded if correct APA is not used. **25% of your grade.**

**Midterm Exam:** There will be a written take-home exam that will count for **25% of your grade.**

**Final Research Proposal and Paper:** You will choose a particular area of interest in the field of traumatology, including issues of diversity within your topic, research the most recent literature on your topic, and write a literature review of your findings from the readings you have completed, paying careful attention to issues of diversity, including: race, ethnicity, sexual orientation, gender bias, differently-abled, etc.

**Some examples of broad topics that can be further refined:** War trauma; military sexual trauma; the response of the VA to returning soldiers; suicide of returning soldiers; the problems of reintegration of returning soldiers; borderline personality disorder and its basis in developmental trauma; self-harming behaviors and its causes and treatment; substance abuse and its relationship to trauma; neurobiology of trauma; the dissociative disorders; efficacious and/or experimental treatment approaches; genocide and/or ethnic conflict; institutional racism and its traumatic effects, historical trauma of indigenous peoples and its effects; homophobia and its effects; intergenerational transmission of trauma and/or resilience; the role of transference and countertransference in trauma treatment; domestic violence; cultural competence in trauma therapy; HIV/AIDS diagnosis and trauma; animal abuse and trauma; institutional trauma; vicarious traumatization in social workers and other helpers. There are many other topics that can be explored; if you have questions, please don't hesitate to ask!

You will need at least 10 references that are articles from peer-reviewed social work or psychology journals. You should also include readings from the course, as these should very much inform your work, but these will **not** count toward the 10 refereed journal articles. Your paper should be 12-15 pages in length, excluding the cover and reference pages.

**A one-page proposal,** which will include a description of your topic of inquiry, a rationale for pursuing the topic, and at least three up-to-date (no earlier than 2008) citations from peer-reviewed journals in correct APA citation, should be submitted to me

for approval by (date). **The final paper is due to be presented in the last class and due on (date). 5 points per day will be deducted for late papers, no exceptions. 50%**

## **LANGUAGE, FORMATTING AND INTEGRITY**

Please be sure that all your written work has correct grammar, punctuation, and spelling, as well as correct APA citation format before handing it in or it will be returned to you. Please use person-first language and make sure you fully understand both the spirit and details related to academic integrity contained in the MSW Program Guide (<https://umaine.edu/socialwork/graduate-programs/msw-overview/>).

Grading will be on a plus/minus basis: 94-100 = A; 90-93 = A-; 87-89 = B+; 84-86 = B; 80-83 = B-; 77-79 = C+; 74-76 = C; etc.

- **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. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314 (**\*Date Issued:** September 1, 2020): <https://www.maine.edu/board-of-trustees/policy-manual/section-314/>
- **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 (due to COVID-19 or other long-term disruptions), 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 any of your teachers about sexual 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.

Behaviors that can be “sexual discrimination” include sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct, and gender discrimination. Therefore, all of these behaviors must be reported

#### **Why do teachers have to report sexual discrimination?**

The university can better support students in trouble if we know about what is happening. Reporting also helps us to identify patterns that might arise – for example, if more than one victim reports having been assaulted or harassed by the same individual.

#### **What will happen to a student if a teacher reports?**

An employee from the Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity will reach out to you and offer support, resources, and information. You will be invited to meet with the employee to discuss the situation and the various options available to you.

If you have requested confidentiality, the University will weigh your request that no action be taken against the institution's obligation to provide a safe, nondiscriminatory environment for all students. If the University determines that it can maintain confidentiality, you must understand that the institution's ability to meaningfully investigate the incident and pursue disciplinary action, if warranted, may be limited. There are times when the University may not be able to honor a request for confidentiality because doing so would pose a risk to its ability to provide a safe, nondiscriminatory environment for everyone. If the University determines that it cannot maintain confidentiality, the University will advise you, prior to starting an investigation



and, to the extent possible, will share information only with those responsible for handling the institution's response

The University is committed to the well-being of all students and will take steps to protect all involved from retaliation or harm.

**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/>



Submit Form

**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 Biomedical Engineering

COURSE DESIGNATOR BEN COURSE NUMBER 551/451 EFFECTIVE SEMESTER FALL 2021

COURSE TITLE Biological and Medical Image Analysis I

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)

Aruba Khalil

Digitally signed by Mehmod Musavi  
DN: cn=Mehmod Musavi, o=University of Maine, ou=College of Engineering,  
email=musavi@maine.edu, c=US  
Date: 2021.02.04 17:17:45-05'00'

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

[Handwritten Signature] 2/8/21

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):

**BEN 551: Biological and Medical Image Analysis I**  
Prerequisites: MAT228, MAT258 (or MAT262 & MAT259) or permission from instructor  
Credit hours: 3  
Description: Introduction to computational analysis of imaging data from biological and medical contexts. Math and physics-based algorithmic development and programming skills centered of scripting languages such as ImageJ and R. Development of a term project. This course would be cross-listed with its undergrad counterpart, BEN 451, which was recently approved.

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

- |  |   |  |  |                                 |
|--|---|--|--|---------------------------------|
| <input type="checkbox"/> Applied Music | <input type="checkbox"/> Clinical                   | <input type="checkbox"/> Field Experience/Internship | <input type="checkbox"/> Research          | <input type="checkbox"/> Studio |
| <input type="checkbox"/> Laboratory    | <input checked="" type="checkbox"/> Lecture/Seminar | <input type="checkbox"/> Recitation                  | <input type="checkbox"/> Independent Study | <input type="checkbox"/> Thesis |

Text(s) planned for use:

None

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

Andre Khalil, Professor of Biomedical Engineering, 2-2.

Reason for new course:

Novel biomedical image acquisition technologies are outpacing our capacity and bandwidth to adequately, quantitatively, and objectively characterize these data. There is strong support (and demand) for additions of mathematical, statistical, and computational instruction in biomedical engineering. Adding a course like this one will help include quantitative literacy content to the engineering curriculum.

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.

This course would be cross-listed with its undergrad counterpart, BEN 451, which was recently approved.

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 Fall semester. No

# BEN 551 Biological and Medical Image Analysis I

Spring 2021

<u>Course description:</u>	Introduction to computational analysis of imaging data from biological and medical contexts. Math and physics-based algorithmic development and programming centered on scripting languages such as ImageJ/Fiji and R. Development of a term project.
<u>Credit Hours:</u>	3
<u>Lectures:</u>	T-Th 11:00am - 12:15pm
<u>Prerequisites:</u>	MAT228, MAT258 (or MAT262 and MAT259) or permission from the instructor.
<u>Requirements satisfied:</u>	Tech elective for biomedical engineering majors.

## Course Delivery Method

<u>Mode of instruction:</u>	Online, synchronous
<u>Digital services:</u>	Electronic materials available online
<u>Hardware:</u>	Students are expected to work on their own computer / laptop.
<u>Software:</u>	ImageJ/Fiji and R are both freely available to download: <a href="https://imagej.net/Fiji">https://imagej.net/Fiji</a> <a href="https://www.r-project.org/">https://www.r-project.org/</a>

## Faculty Information

<u>Instructor:</u>	Andre Khalil
<u>Office:</u>	308A Jenness Hall
<u>Phone:</u>	581-3911
<u>E-mail:</u>	<a href="mailto:andre.khalil@maine.edu">andre.khalil@maine.edu</a>
<u>Office hours:</u>	Thursdays 1-3pm and by appointment

## Instructional Materials and Methods

<u>Textbook required:</u>	None
<u>Reading materials:</u>	Journal articles, online videos, assignments, and slides used in class are available online.

**Course Goals:** The objective of this course is to learn about basic and advanced mathematical / computational image analysis techniques.

**Instructional Objectives:** Students are expected to attend all lectures and to participate in group discussions, to complete all homework assignments, and to work on a term project that they present to the rest of the class at the end of the semester in a poster presentation, and as a written term paper.

**Student Learning Outcomes:** Students will:

- Apply image analysis techniques to real world scenarios. (These techniques include: object segmentation with and without noise, morphology and position analysis, co-localization, the Metric Space Technique, characterizing anisotropy, power spectral and wavelet-based techniques for the analysis of monofractal / multifractal rough surfaces, and sensitivity to imaging conditions (resolution, pixel size, finite size effects, edge effects, image saturation.)
- Construct programs with scripting languages (ImageJ/Fiji) and statistical analysis software (R).
- Justify their programming decisions.
- Develop an algorithmic strategy, implement it numerically, apply it on data, and interpret results.
- Summarize project findings and present them to specific audiences.

**Evaluation:** There will be a total of 7 assignments, each carrying equal weight, and altogether count for 50% of the grade. The term project poster counts for 15%, the class presentation counts for 15%, and the term paper counts for 15%. Attendance and active class participation will have an impact on the final grade (5%). Unjustified late assignments will have a 10% deduction per day late.

**Term project grading rubric: (30%) Overall presentation:** Introduction, main section, conclusion, follow time constraints, balance between generalities vs specific examples; **(20%) Clarity:** Quality of the slides, readability, speech speed, pauses; **(20%) Create interest of audience:** Attract questions from the audience. Did the audience understand well? Did the presenter ask questions to the audience? **(25%) Depth of research:** Did they search the literature? Did they meet with or contact scientists in the field? Did they develop new skills / knowledge? **(5%) Level of difficulty.**

**Grading scale:**

[93-100] = A; [90-93) = A-; [86.7-90) = B+; [83.3-86.7) = B; [80-83.3) = B-; [76.7-80) = C+; [73.3-76.7) = C; [70-73.3) = C-; [66.7-70) = D+; [63.3-66.7) = D; [60-63.3) = D-; [0,60) = F.

**Course Schedule**

Topics	Time Spent
<b>Introduction</b> <ul style="list-style-type: none"> <li>- Overview of course content</li> <li>- Installation of ImageJ/Fiji and online tutorials</li> <li>- <b>Assignment #1</b></li> </ul>	1 week
<b>Introduction to multidimensional biomedical data analysis</b> <ul style="list-style-type: none"> <li>- Review of imaging modalities</li> <li>- Image resolution, pixel size, finite size effects, edge effects</li> <li>- Segmentation techniques</li> </ul>	1 week
<b>Image segmentation: introduction to automated thresholding methods</b> <ul style="list-style-type: none"> <li>- Introduction to ImageJ scripting and R programming</li> <li>- Automated histogram-based thresholding methods</li> <li>- Segmentation of simulated cells</li> <li>- Statistical analysis of cell areas from different datasets</li> <li>- <b>Assignment #2</b></li> </ul>	2 weeks
<b>Image segmentation: advanced thresholding scripting on large datasets</b> <ul style="list-style-type: none"> <li>- Analysis of several datasets with hundreds of images</li> <li>- Statistical analysis of cell areas from different datasets</li> <li>- <b>Assignment #3</b></li> </ul>	2 weeks
<b>Biomedical signal processing</b> <ul style="list-style-type: none"> <li>- Convolution</li> <li>- Fourier transform and Fourier series</li> <li>- Fast-Fourier transform</li> <li>- Gibbs phenomenon</li> <li>- <b>Assignment #4</b></li> </ul>	2 weeks
<b>Image power spectral analysis</b> <ul style="list-style-type: none"> <li>- Fractional Brownian motion surfaces</li> <li>- Simulation of fluorescence microscopy images of cell cultures</li> <li>- Fourier power spectral analysis of simulated biomedical images</li> <li>- <b>Assignment #5</b></li> </ul>	2 weeks
<b>Introduction to fractal geometry</b> <ul style="list-style-type: none"> <li>- Chaos game</li> <li>- Box-counting technique</li> <li>- Applications of fractal concepts in biomedical image data</li> <li>- <b>Assignment #6</b></li> </ul>	2 weeks
<b>Introduction to wavelets and multifractal analyses</b> <ul style="list-style-type: none"> <li>- Discrete wavelet-transform</li> <li>- Continuous wavelet-transform</li> <li>- Analysis of scale-invariant data (monofractal and multifractal)</li> <li>- Wavelet transform modulus maxima (WTMM) method</li> <li>- <b>Assignment #7</b></li> </ul>	2 weeks
<b>Term project presentations</b> <ul style="list-style-type: none"> <li>- Students present their work in class and submit their posters and term papers</li> </ul>	1 week

**Academic Honesty:** <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Academic>

**Students with Disabilities:** <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Accessibility>

**Course Schedule Disclaimer:** <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Schedule>

**Observance of Religious Holidays/Events:** <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Observance>

**Sexual Discrimination Reporting:** [https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Reporting\\_Short](https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Reporting_Short)



Submit Form

**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 Biomedical Engineering

COURSE DESIGNATOR BEN COURSE NUMBER 552/452 EFFECTIVE SEMESTER SPRING 2022

COURSE TITLE Biological and Medical Image Analysis II

**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
- Description Change
- Cross Listing (must be at least 400-level)<sup>1</sup>
- Number Change
- Prerequisite Change
- Other (specify) \_\_\_\_\_
- Title Change
- Credit Change

**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)**

Andre Khalil

Digitally signed by Mohamd Musavi  
DN: cn=Mohamd Musavi, o=University of Maine, ou=College of Engineering, email=musavi@maine.edu, c=US  
Date: 2021.02.04 17:15:19 -05'00'

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

**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):

BEN 552: Biological and Medical Image Analysis II  
Prerequisites: BEN 551 or permission from the instructor  
Credit hours: 3  
Description: Advanced computational analysis of imaging data from biological and medical contexts. Math and physics-based algorithmic development and programming centered on scripting languages such as ImageJ/Fiji and R. Development of a term project. In consultation with the instructor, each student will work on the computational analysis / modeling of one or more biomedical image datasets.

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

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

Andre Khalil, Professor of Biomedical Engineering, 2-2.

Reason for new course:

Novel biomedical image acquisition technologies are outpacing our capacity and bandwidth to adequately, quantitatively, and objectively characterize these data. There is strong support (and demand) for additions of mathematical, statistical, and computational instruction in biomedical engineering. Adding a course like this one will help include quantitative literacy content to the engineering curriculum.

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.

This course would be cross-listed with its undergrad counterpart, BEN 452, which was recently approved.

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 Spring semester. No

**SECTION 2 (FOR COURSE MODIFICATIONS)**

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

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

Reason for course modification:

**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](mailto:graduate@maine.edu). Please include in the subject line 'Course Proposal' and the course designator and number.



<b>Designation:</b> Elective	<b>Instructor:</b> Andre Khalil
<b>Credit Hours:</b> 3	<b>Office:</b> 308A Jenness Hall
<b>Prerequisites:</b> BEN 551 or permission of the instructor	<b>Phone:</b> 581-3911
<b>Lectures:</b> TBD	<b>E-mail:</b> <a href="mailto:andre.khalil@maine.edu">andre.khalil@maine.edu</a>
<b>Classroom:</b> Online via Zoom (synchronous)	<b>Office hours:</b> By appointment, via Zoom

### Course Objectives

Advanced computational analysis of imaging data from biological and medical contexts. Math and physics-based algorithmic development and programming centered on scripting languages such as ImageJ/Fiji and R. Development of a term project. In consultation with the instructor, each student will work on the computational analysis / modeling of one or more biomedical image datasets.

**Course Goals:** The objective of this course is to learn about the exploration and application of advanced mathematical / computational image analysis techniques.

**Instructional Objectives:** Students are expected to attend all lectures and to participate in group discussions, to present their individual progress on a weekly basis, and to work on a term project that they present to the rest of the class at the end of the semester in a poster presentation. They will also submit a term paper.

**Student Learning Outcomes:** Students will:

- Apply image analysis techniques to real world scenarios. (These techniques include: object segmentation with and without noise, morphology and position analysis, co-localization, the Metric Space Technique, characterizing anisotropy, power spectral and wavelet-based techniques for the analysis of monofractal / multifractal rough surfaces, and sensitivity to imaging conditions (resolution, pixel size, finite size effects, edge effects, image saturation.)
- Construct programs with scripting languages (ImageJ/Fiji) and statistical analysis software (R).
- Justify their programming decisions.
- Develop an algorithmic strategy, implement it numerically, apply it on data, and interpret results.
- Summarize project findings and present them to specific audiences.

**Evaluation:** The weekly reports and presentations count for 25% of the grade. The final presentation of the term project to the rest of the class at the end of the semester, accompanied by a poster and a term paper, counts for 75%. In their paper and presentation, the student should introduce the subject, discuss the biomedical context, present a survey of the existing literature and justify the need for the development of novel algorithms, describe the data, articulate how they emitted their hypothesis, share their results, interpretation, and conclusions.

**Term project grading rubric: (30%) Overall presentation:** Introduction, main section, conclusion, follow time constraints, balance between generalities vs specific examples; **(20%) Clarity:** Quality of the slides, readability, speech speed, pauses; **(20%) Create interest of audience:** Attract questions from the audience. Did the audience understand well? Did the presenter ask questions to the audience? **(25%) Depth of research:** Did they search the literature? Did they meet with or contact scientists in the field? Did they develop new skills / knowledge? **(5%) Level of difficulty.**

### Grading scale:

[93-100] = A; [90-93] = A-; [86.7-90] = B+; [83.3-86.7] = B; [80-83.3] = B-; [76.7-80] = C+; [73.3-76.7] = C; [70-73.3] = C-; [66.7-70] = D+; [63.3-66.7] = D; [60-63.3] = D-; [0,60] = F.

## Course Schedule

Topics	Time Spent
<b>Exploration of research project topics</b> <ul style="list-style-type: none"><li>- In collaboration with instructor and rest of class, students explore research topics</li><li>- Submit weekly journal entries</li></ul>	1-2 weeks
<b>Selection of research project topic</b> <ul style="list-style-type: none"><li>- Presentation of selected research topic to the rest of the class</li><li>- Receive feedback from classmates / provide feedback to classmates</li><li>- Submit weekly journal entries</li></ul>	1 week
<b>Work on research project</b> <ul style="list-style-type: none"><li>- Update presentations to the rest of the class</li><li>- Receive feedback from classmates / provide feedback to classmates</li><li>- Submit weekly journal entries</li></ul>	11 weeks
<b>Term project presentations</b> <ul style="list-style-type: none"><li>- Students present their work in class and submit their posters and papers</li></ul>	1 week

Academic Honesty: <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Academic>

Students with Disabilities: <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Accessibility>

Course Schedule Disclaimer: <https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/#Schedule>

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## 2021 Summer Dissertation Writing Fellowships

The Graduate School is again offering its summer dissertation writing fellowship program for qualified applicants, with a limited number of offices available in Stodder Hall between June 1 and August 15 for those students who have the most urgent need for work/writing space. Graduate students will also be considered for summer dissertation fellowships if they do not require office space.

Dissertation writing fellowships are open to doctoral students who have passed their comps and are actively writing their dissertations. Depending on number of applicants, the Graduate School will consider master's students who have completed four semesters of study and are actively engaged in writing a thesis, but preference will be given to doctoral students, with a priority for doctoral students who are in their semester or two of graduate study.

Three to five full awards of \$5,700 paid over 3 months will be awarded and up to five additional awards cost-shared 50/50 with graduate programs/advisors who can only provide partial summer support.

Applications are due at [umgradawards@gmail.com](mailto:umgradawards@gmail.com) (subject line "Summer Dissertation") **by midnight May 21, 2021**. Awards will be announced on May 28. Each application must consist of:

1. A 1-page dissertation or thesis prospectus
2. A 1-page summary of progress toward degree completion and plan of work for the summer (including the need for office space if applicable). Include the projected completion date and indicate the effect of the summer fellowship on the projected completion date. Preference will be given to applicants who present a feasible plan to graduate by December 2020 or earlier. Students with other sources of financial support beyond the cost sharing described in this document **are ineligible** for summer dissertation fellowships.
3. A 1-paragraph recommendation by the faculty advisor (sent separately with subject line "Summer Dissertation Rec – Student Name"). The recommendation should endorse the feasibility of the work plan and speak briefly to the quality of the student and the importance of the research as well as the need for financial support. Students whose advisors or programs can provide cost share are more likely to receive funding.

# **Engineering Applications of Artificial Intelligence Certificate Program**

## **Certificate Coordinators**

Mohamad Musavi, Associate Dean, College of Engineering

Yifeng Zhu, Professor of Electrical and Computer Engineering (ECE)

## **Rationale**

Driven by rapid advances in new algorithms, big data, and computational power, Artificial Intelligence (AI), especially machine learning, is revolutionizing every aspect of our daily lives including applications in engineering domains, such as smart manufacturing, industry 4.0, autonomous vehicles, smart grids, and internet of things (IoT). According to PwC Global Artificial Intelligence study, it is expected that over the next ten years AI will contribute \$15.7 trillion dollars to the global economy boosting GDP for local economies by 26%. Deloitte's study shows that 73% of 1,089 global enterprises surveyed will prioritize investment on AI tools in the post-pandemic norm. The Burning Glass Program Insights Reports for AI and Machine Learning reflect that in Maine there were 116 job postings in machine learning in the last 12 months with an average salary of \$114,000 with 102.5% job posting growth by 2023. More than 50% of these jobs are in the manufacturing sector where engineering applications of AI can increase productivity, resilience and adaptability of processes such as those found in automotive, aerospace, shipbuilding, microelectronics, pulp and paper, energy and utilities, and many related industries. AI will play a critical role for the growth of the Maine economy.

The University of Maine has historically maintained a significant presence in AI with the development of related courses such as Artificial Neural Networks, Deep Learning, Fuzzy Logic, and Robotics. Although UMaine students and industry professionals have access to these courses, there is no particular program and emphasis in Maine for engineering applications. The proposed certificate program will address this shortcoming for the benefit of industry professionals as well as undergraduate and graduate students. Students will develop the capabilities of applying AI tools and appropriate approaches to solve practical problems in various engineering disciplines. Currently, AI-related engineering application areas within the College of Engineering include but are not limited to transportation engineering, biomedical engineering, aerospace engineering and design, robot dynamics and control, advanced manufacturing, and water resources engineering.

## **Requirements**

The proposed free-standing certificate program requires the completion of 12 credits (4 courses) through a combination of 400- and 500-level courses as described in the proposed course sequence section below. A maximum of one course (or 3 credits) at 400 or 500 level may be transferred from outside of UMaine to the program for credit.

**Undergraduate students** will earn a certificate with a minimum GPA of 2.5 in courses that count toward the certificate with a minimum grade of C in each course.

**Graduate students** will earn a certificate with the lowest acceptable grade of C in a maximum of one course. At least three of the completed courses (9 credits) must be at 500-level.

The program shall be completed within 3 years from the date of acceptance into the program.

### **Prerequisites**

Undergraduate applicants should have taken at least one course in each of the following three areas:

- college calculus (MAT 228 or equivalent),
- statistics and probability (STS 232, STS 332, STS 434, ECE 316, CHE 350 or equivalent), and
- engineering-level software programming (ECE 177, MEE 125, CIE 115, PHY 241, COS 125 or equivalent).

Class assignments in core courses listed below will use Python or Matlab. If students have extensive programming experiences in a different language (C/C++/Java/JavaScript/Perl/R), we recommend they familiarize themselves with Python and Matlab before their first course. In addition, it is expected that students who take COS 470 should have COS 226 (data structures and algorithms) or equivalent.

For graduate students and professionals, an earned baccalaureate degree or its equivalent in a STEM discipline from an accredited college or university is required for admission. A minimum grade point average of 2.5 applies to all candidates and minimum TOEFL score of 80 (IbT), 6.5 (IELTS) or 60 (PTE Academic) are required for international students.

The courses completed for this certificate program may be counted towards an undergraduate or graduate degree per the guidelines of the respective undergraduate or graduate degree program.

### **Proposed Course Sequence**

The proposed certificate program requires completion of 12 credits of coursework (4 courses) divided into two categories of core and elective courses as described below. Elective courses are classified into two categories: either (Category I) expose a new perspective of AI to increase the breadth, such as Fuzzy Logic, or (Category II) create an opportunity to apply AI to specific applications. All electives involve a course project, such as robotics and medical image analysis. All students in this certificate program must apply appropriate AI approaches learned from core courses to projects in elective courses.

- a. Core Courses (6 credit hours)
  1. ECE 491/591<sup>1</sup> Deep Learning (3 credits)
  2. ECE 490/590<sup>2</sup> Neural Networks (3 credits) or  
COS 470/570<sup>3</sup> Introduction to Artificial Intelligence (3 credits)
  
- b. Elective Courses (6 credit hours, any two courses from the list below)  
Category I:
  1. COS 470/570 Introduction to Intelligence (3 credits) or  
ECE 490/590 Artificial Neural Networks (3 credits)

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<sup>1</sup> Prerequisites of ECE 491/591: ECE 177 or COS 220 or CIE 115 or MEE 125 or permission.

<sup>2</sup> ECE 490 is the intended dual-listed course with ECE 590 Neural Networks. Prerequisites: MAT 258.

<sup>3</sup> Prerequisites of COS 470: COS 226 or permission.

2. ECE 577<sup>4</sup> Fuzzy Logic (3 credits)
3. COS 475/575<sup>5</sup> Machine Learning (3 credits)

Category II:

4. ECE 533<sup>6</sup> Advanced Robotics (3 credits)
5. MEE 444<sup>7</sup>/551<sup>8</sup> Robot Dynamics & Control (3 credits)
6. ECE 417<sup>9</sup> Introduction to Robotics (3 credits, only for undergraduate certificate)
7. MEE 459/559<sup>10</sup> Engineering Optimization (3 credits) or CIE 521<sup>11</sup> Civil Engineering Systems and Optimization (3 credits)
8. BEN 451/551<sup>12</sup> Biological and Medical Image Analysis I (3 credits)
9. BEN 452/552<sup>13</sup> Biological and Medical Image Analysis II (3 credits)

### **Educational Objectives**

- Gain sufficient knowledge of AI methods for developing engineering applications based on modern AI tools.
- Develop skills necessary for analysing and processing data, and designing, implementing, and testing AI methods using available tools such as Matlab and Python.
- Establish suitability and validation of AI methods for engineering applications.

### **Graduate Certificate Program Learning Outcomes**

The graduate certificate will enable students to

#### ***Understand, interpret, shape, and augment the knowledge base by***

- Identifying and formulating engineering problems and applying principles of engineering and AI
- Integrating AI concepts, modern tools and best practices to recommend technically appropriate solutions

*Satisfied by:* coursework, exams and class projects

#### ***Share disciplinary expertise openly, effectively, and accurately by***

- Creating professional-quality reports, engineering design projects, and/or presentations with significant technical content that applies AI to engineering problems
- Working in a multi-disciplinary team in course projects whenever possible

*Satisfied by:* forming a course project team with individuals from different disciplines, classes with a design project that includes a report and/or presentation.

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<sup>4</sup> Prerequisites of ECE 577: ECE 477 or permission.

<sup>5</sup> COS 475/575 are the intended designators for COS 598 Machine Learning.

<sup>6</sup> Prerequisites of ECE 533: ECE 417 or permission.

<sup>7</sup> Prerequisites of MEE 444: A grade of C or better in MEE 270, and MEE 380.

<sup>8</sup> Prerequisites of MEE 551: A grade of C or better in MEE 270, and MEE 380.

<sup>9</sup> Prerequisites of ECE 417: MAT 228 and ECE 177 or COS 220 or permission.

<sup>10</sup> Prerequisites of MEE 459/559: MAT 228 and MAT 258 or permission.

<sup>11</sup> Prerequisites of CIE 521: MAT 126 and MAT 127 or permission.

<sup>12</sup> Prerequisites of BEN 451/551: MAT 228 and MAT 258 (or MAT 262 and MAT 259) or permission.

<sup>13</sup> Prerequisites of BEN 452/552: BEN 451/551 or permission.

***Demonstrate responsible and ethical practice by***

- Identifying potential sources of bias in data, and choosing correct metrics for evaluating a model on an imbalanced data set
- Applying engineering designs that consider safety, economic factors, public welfare, and environmental factors

*Satisfied by:* lecture on generalization (overfit/underfit) and performance metrics (sensitivity/specificity) in the required course ECE 491/591, and course projects that are part of each of the elective courses.

**Evidence of Course Sequence Meeting Educational Objectives**

The major areas in this certificate program are:

- 1 Data analysis and preparation,
- 2 Designing, implementing, testing, and applying AI methods to engineering applications, and
- 3 Determining suitability of AI methods for different applications.

The three educational objectives are covered in the two Core Courses, listed in section (a) above, as well as Elective Courses. For example, ECE 491/591 cover a modern machine learning architecture called deep neural networks, as well as the algorithms used to train them. Students learn fundamental knowledge and gain hands-on experience of building deep learning programs on cloud or local supercomputing platforms to solve practical applications. ECE 490/590 covers topics related to data preparation, design, implementation, testing, and application of different Artificial Neural Network methods. Similarly, COS 470 covers a wide range of topics in AI. Furthermore, the Elective courses provide more depth and breadth of knowledge related to AI methods and applications.

**Faculty**

The following graduate faculty have taught the proposed certificate courses:

1. Core Courses: Yifeng Zhu (ECE), Mohamad Musavi (ECE), and Roy Turner (COS)
2. Elective Courses: Salimeh Yasaei Sekeh (COS), Rick Eason (ECE), Bruce Segee (ECE), Andre Khalil (Biomedical Engineering), Ali Shirazi (Civil Engineering), and Masoud Rais-Rohani (Mechanical Engineering), Babak Hejrati (Mechanical Engineering)

**Mode of Delivery**

While the certificate consists of on-campus and online courses, it can be completed online by taking two core courses and two out of electives courses, as identified below.

- Core courses: ECE 491/591 and ECE 490/590
- Elective courses: ECE 577, ECE 533, and COS 475/575

**Timeframe for Certificate Completion**

The courses in the sequence will be offered on an annual or bi-annual basis. Considering the number of credits required and the frequency of offering each course in the sequence, it is anticipated that the certificate can be completed in one to two years.

**Fiscal Criteria**

The courses included in the sequence will be taught as part of the regular teaching assignment for the associated instructors in their respective units. An overload compensation is not required for certificate courses.



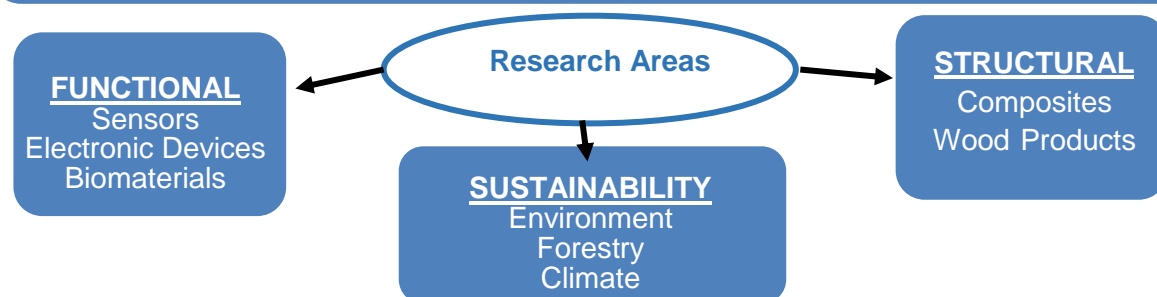
## Materials Science & Engineering Concentration: I-PhD

### Overview

Collaboration across Research Centers (FIRST, FBRI, ASCC) and Colleges (COE, CLAS, NSFA)

#### CORE ELEMENTS

- |                                 |  |
|---------------------------------|--|
| (1) 2 Core & 5 Elective courses | (2) Comprehensive Exam                   |
| (3) Seminar series              | (4) Research proposal                    |
| (5) Presentation                | (6) Research project (Student & Advisor) |



**Mission & Goals:** The I-PhD Concentration in Materials Science & Engineering will enhance the mission of the University of Maine by preparing students for successful careers in a variety of industry sectors that require a workforce trained in Materials Science & Engineering. These include: Chemical Processing, Electronics, Metals, Ceramics, Polymers, Composites, Manufacturing & Product Development, Defense, Infrastructure, Health Care and Biomedical Technologies. The materials-focused I-PhD program will help improve the quality of life in Maine by creating a high-tech hub with trained workforce and entrepreneurs who can attract global investment and high-paying jobs to this region.

**Benefit for Graduate Students:** Success of many engineering applications depend on designing, fabricating and utilizing materials with specific sets of functional properties. A specialty in Materials Science & Engineering within the I-PhD program will prepare students to understand and utilize the correlations between structure, composition, processing and properties of materials, from nanometer to microscopic and macroscopic scales, for a wide variety of multi-disciplinary applications ranging from aerospace, transportation and infrastructure to energy, environment, and biotechnology. This materials-focused program would be an umbrella concentration within the current I-Ph.D. program and make it easier for potential employers to identify students with this training, from within a larger breadth of expertise across multiple departments and research centers.

**Resource Needs:** Resource need is minimal to get started, since large number of elective courses are already being delivered across different Colleges and Departments. The only new components are (i) a team-taught Core Course and (ii) a Seminar/Discussion series that will be mandatory for all students.

#### **Objectives:**

- Provide students with graduate level knowledge in concepts of materials science & engineering.
- Cross-train the next generation of professionals in multi-disciplinary areas with theoretical and experimental skills that can adapt to rapidly changing global trends in materials-related technologies.

**Academic Coursework:** The curriculum consists of two core courses (a team-taught 2-semester sequence), a year-long seminar and discussion series, and five graduate level electives, to be jointly decided by the student and advisor and approved by the Graduate School. This common core will bring together a diverse cohort of students, who come from different undergraduate backgrounds and academic departments, on a common platform for effective collaboration and idea exchange, and will provide them with skills to be very competitive for future jobs in materials science & engineering.

**Table 1: Course-list (details in attached document)**

<b>Core Course Requirements in Materials Science and Engineering</b>
<p><b>Prerequisite course (if needed):</b> Students who do not have adequate undergraduate exposure to materials science concepts will need to take one of the prerequisite materials-related undergraduate courses from any participating department. Possible examples include: PHY 480 Physics of Materials, CHE 410 Advanced Materials, MEE320 Materials Engineering and Science etc.</p>
<p style="text-align: center;"><b>2-Semester Core Course Sequence: Advances in Materials I and II</b> <b><i>(To be developed pending approval of the concentration)</i></b></p> <p>This Core Course sequence will provide a graduate-level understanding of materials science and engineering and how they are capable of impacting the rapidly changing technologies of the 21<sup>st</sup> century. Topics include: Atomic Structure &amp; Bonding, Crystal Structures &amp; Geometry, Imperfections (Defects) in Crystals, Thermodynamics of Solids, Diffusion and Kinetics in Solids, Mechanical Properties, Materials Strengthening, Failure &amp; Fracture, Phase Diagrams, Phase Transformations, Metals, Ceramics, Polymers, Composites, Nano-scale &amp; Hybrid Materials, Functional Properties and Applications: Electrical, Optical, Thermal and Magnetic, Characterization Techniques.</p>
<p><b>Mandatory Seminar and Discussion Series:</b> Invited speakers, both internal and external to UMaine, will provide exchange of materials-related innovations in advanced sensors &amp; devices, infrastructure, sustainable technologies, energy and biomedical applications. PhD students will be expected to attend the seminars and participate in follow-up discussions. They will also make annual presentations in this series after their first year.</p>
<b>A least five courses from the following electives</b> <b>(If student has completed an MS degree, two prior graduate courses may be counted)</b>
<p style="text-align: center;"><b><i>Tentative list to be finalized on approval</i></b></p> <ul style="list-style-type: none"> <li>● ECE 465/565 - Introduction to Sensors: 3 credits (to be modernized and expanded as Grad course)</li> <li>● ECE 466/5XX - Sensor Technology and Instrumentation: 4 credits (to be modernized and expanded as Grad Course)</li> <li>● SFR 570 - Cellulose Nanomaterials and their Composites</li> <li>● BEN 502 - Advanced Materials in Bio-inspired Engineering</li> <li>● CIE 543 - Introduction to Composite Materials in Civil Engineering</li> <li>● PHY 500 – Topics in Materials Science – Thin Film Technology</li> <li>● PHY 624 - Solid State Physics I</li> <li>● MEE 555 - Smart materials</li> <li>● CHY 598 – Nanoscience</li> <li>● CHE 533 - Introduction to Polymer Processing</li> <li>● CHE 540/541 – Advanced Chemical Engineering Thermodynamics</li> <li>● CHY 573: Computer Simulation Methods</li> <li>● CHY 578: Nanoscience</li> <li>● CIE 542 - Advanced Reinforced Concrete Design</li> <li>● CIE 544 - Design of Wood Structures</li> </ul>

- CIE 543: Introduction to Composite Materials in Civil Engineering
- ECE 663 - Design and Fabrication of Surface Wave Devices
- CHY 541- Topics in Analytical Chemistry, Spectroscopy & Vacuum Techniques
- CIE 544: Design of Wood & Masonry Structures
- CIE 598: Environmental Nanotechnology
- SFR 570: Cellulose Nanomaterials and their Composites

**Existing Research Centers and Institutes that will benefit:**

FIRST

ASCC

FBRI

MSBSE

Climate Change Institute

Center for Research on Sustainable Forests

**Outside Collaborators within Maine:** Industry (e.g. Texas Instruments, ON Semiconductor, AVX, Cerahelix, OSS, Pratt Whitney, IDEXX laboratories, Environetix, Jackson Labs, Hydro-Photon Inc.), MDI Biological Laboratory, Marine Resources Group, USM, Colby, Bates, Bowdoin, UNE, UMM, Maine Maritime Academy.

**Collaborators outside State of Maine:** Federal laboratories (Oak Ridge, Air Force, EPA, Argonne, Sandia, NREL), for-profit companies, and a large number of national/international universities that have collaborative projects with the faculty listed above.

**APPENDIX - Committee**

- Sharmila M. Mukhopadhyay (FIRST and MEE), Convener
- Douglass Gardner (ASCC and FBRI)
- David Neivandt (CBE)
- Mauricio Pereira da Cunha (ECE)
- Robert Lad (Physics)
- Carl Tripp (Chemistry)

## Brief Course Descriptions

### Core

#### **INT XXX & INT XXY: 2-Semester Core Course Sequence: Advances in Materials I and II (To be developed pending approval of this concentration)**

This Core Course sequence will provide a graduate-level understanding of materials science and engineering and how they are capable of impacting the rapidly changing technologies of the 21st century. Topics include: Atomic Structure & Bonding, Crystal Structures & Geometry, Imperfections (Defects) in Crystals, Thermodynamics of Solids, Diffusion and Kinetics in Solids, Mechanical Properties, Materials Strengthening, Failure & Fracture, Phase Diagrams, Phase Transformations, Metals, Ceramics, Polymers, Composites, Nano-scale & Hybrid Materials, Functional Properties and Applications: Electrical, Optical, Thermal and Magnetic, Characterization Techniques.

**2-Semester Mandatory Seminar and Discussion Series:** Invited speakers, both internal and external to UMaine, will provide exchange of materials-related innovations in advanced sensors & devices, infrastructure, sustainable technologies, energy and biomedical applications. PhD students will be expected to attend the seminars and participate in follow-up discussions. They will also make annual presentations in this series after their first year.

### Electives

#### **BEN 502: Advanced Materials in Bio-inspired Engineering**

This course will cover advanced materials inspired by nature using directed problem solving and hands-on exploration, building on information learned in BEN 403. Students will be exposed to the power of an integrated approach to engineering which draws on biological principles and materials science to create the materials of the future. Class notes: students will need to have a good background in chemistry, physics, biology, and mathematics.

**Prerequisites & Notes:** BEN 403.

Credits: 3

#### **CHE 540/541: Advanced Chemical Engineering Thermodynamics**

Studies of phase and reaction equilibria in multi-component, non-ideal, and complex systems. Flow and non-flow systems. Application of general thermodynamic methods to problems in chemical engineering. Lec 3. (Fall.)

Credits: 3

#### **CHY 523 - Advanced Polymer Chemistry**

Polymer types, synthesis kinetics and mechanisms, characterization techniques, and molecular structure and applications in contemporary polymer science concepts and literature. Because of overlap, CHY 423 and CHY 523 cannot both be taken for degree credit.

**Prerequisites & Notes:** A grade of C- or better in CHY 252 or equivalent: or permission

#### **CHY 541: Topics in Advanced Analytical Chemistry**

Topics may include advanced techniques in bioanalytical separation, Fourier transform, spectroscopy, mass spectrometry and other vacuum technologies. Influence of hardware & software components such as analyzers, detectors, sources and digital/electronic filters for noise removal and improved detection limits.

**Prerequisites & Notes:** permission.

Credits: 1-3

**CHY 573: Computer Simulation Methods**

Computer simulation using Monte Carlo and molecular dynamics techniques with applications in chemistry, physics, materials science and molecular biology.

**Prerequisites & Notes:** A grade of C- or better in CHY 471 or PHY 236 and knowledge of FORTRAN.

Credits: 3

**CHY 578: Nanoscience**

Fundamental concepts in nanoscience explored: Scaling principles, nanoscale materials, micro/nano fabrication techniques, atomic manipulations and nanorobotics. Because of overlap between CHY 477, ECE 457 and CHY 578 only one can be taken for degree credit.

**Prerequisites & Notes:** CHY 122 (or CHY 131), PHY 122, and MAT 258; CHY 471 and CHY 472 recommended, but not required; or permission.

Credits: 3

**CIE 543: Introduction to Composite Materials in Civil Engineering**

An introduction to the mechanics of fiber-reinforced polymer (FRP) composite materials in civil engineering with a view to structural design. Understanding of material properties, fabrication processes, fundamental mechanics, experimental procedures and methods of analysis and design. Lec 2, Lab 1.

**Prerequisites & Notes:** Senior or graduate standing in Engineering or Wood Science and Technology; MEE 251 or equivalent and CIE 340 or equivalent. The student should have at least one course each in mechanics, calculus/linear algebra and computer programming.

Credits: 3

**CIE 544: Design of Wood & Masonry Structures**

Study of unique mechanical and design characteristics of structural wood and masonry members and design of systems containing these members. Analysis of lateral load force resisting systems that incorporate diaphragms and shear walls. (4.0 ED/0.0 ES.) Lec 3, Lab 3.

**Prerequisites & Notes:** CIE 443 or permission.

Credits: 4

**CIE 598: Environmental Nanotechnology**

Advanced topics in Civil Engineering not regularly covered in other courses. Content varies to suit individual needs. May be repeated for credit with permission of department. (Fall and Spring.)

**Prerequisites & Notes:** permission.

Credits: 1-3

**ECE 465: Introduction to Sensors 3 credits (modernized and expanded)**

Various types of conductometric, acoustic, magnetic, thermal and optical sensors are presented. Techniques for interfacing the sensors using microprocessor control systems and signal processing are discussed. Applications of sensor systems in medicine, environmental monitoring, the automotive industry, the chemical industry, manufacturing and construction are given. (Spring.)

Prerequisites: junior standing in engineering.

Course Typically Offered: Fall and Summer  
Credits: 3

**ECE 466: Sensor Technology and Instrumentation 4 credits (modernized and expanded)**  
Design and fabrication techniques for piezoelectric, thin film, fiber optic and silicon based sensors. Topics include: cutting, polishing and cleaning crystals, the deposition of electrodes and sensing elements and sensor characterization. Students will design, fabricate and test a sensor.

**Prerequisites:** ECE 465

**Course Typically Offered:** Fall  
Credits: 4

**ECE 663: Design and Fabrication of Surface Wave Devices**

Covers the design, fabrication and measurement of surface acoustic wave (SAW) devices, e.g. delay lines, filters, resonators, oscillators, convolvers and sensors. Topics include: planar fabrication techniques, surface properties of piezoelectric crystals, photolithography, vacuum technologies for thin film deposition, electronic systems for the measurements of impulse and frequency response, phase and group velocity, insertion loss, distortions and spurious effects. Lec 2, Lab 3. (Spring.)

**Prerequisites & Notes:** ECE 550, ECE 662 or permission.  
Credits: 3

**MEE 555: Smart Materials**

A general coverage of all existing smart/active materials and biomaterials, their characteristics, properties, functions, modeling and simulations and engineering, scientific and medical applications.

**Prerequisites & Notes:** Graduate standing or permission.  
Credits: 3

**PHY 500: Topics in Materials Science & Technology-Thin Film technology**

**Prerequisites & Notes:** PHY 463, PHY 469, PHY 480 or their equivalents.  
Credits: 1-3

**PHY 624: Solid State Physics I**

Covers free electron theory of metals, crystal lattices and reciprocal lattices, X-ray diffraction, electron levels in a periodic potential, semi-classical model of electron dynamics.

**Prerequisites & Notes:** PHY 503 or permission of instructor.  
Credits: 3

**SFR 570: Cellulose Nanomaterials and their Composites**

Comprehensive coverage of the production, characteristics, processing, applications and performances of renewable nanomaterials and their composites. The graduate level course will provide fundamental information on various types of cellulose nanomaterials as well as their performance in target applications. Students may be required to conduct individual/team experiments, visit production sites and hold informal meetings as scheduled along the course of the semester outside the original time frame.

**Prerequisites & Notes:** Recommendation of the student's advisory committee or permission of

the instructor.  
Credits: 3

## **Tentative Faculty Listing: Interdisciplinary Faculty in Materials Science & Engineering**

### **INITIAL PLANNING COMMITTEE**

1. Sharmila Mukhopadhyay, Convener, MEE
2. Douglas Gardner, SFR
3. Robert Lad, PHY
4. David Neivandt, CHB
5. Mauricio Pereira da Cunha, ECE
6. Carl Tripp, CHY

### **FACULTY MEMBERS**

7. François Amar, CHY
8. Onur Apul, CEE
9. Sheila Edalatpour, MEE
10. Nuri Emanetoglu, ECE
11. Brian Frederick, CHY
12. Sam Hess, PHY
13. Caitlin Howell, CHB
14. Bashir Khoda, MEE
15. Eric Landis, CEE
16. Ling Li, SFR
17. Robert Meulenberg, PHY
18. Tom Schwartz, CHB
19. Mehdi Tajvidi, SFR
20. John Vetelino, ECE
21. Yingchao Yang, MEE
22. Liping Yu, PHY

### **ASSOCIATE FACULTY**

23. Douglas Bousfield, CHB
24. Alice Bruce, CHY
25. Mitchell Bruce, CHY
26. Barbara Cole, CHY
27. Habib Dagher, CEE
28. William Gramlich, CHY
29. Babak Hejrati, MEE
30. Karl Kreutz, CCI
31. Andrei Kurbatov, CCI
32. Jean MacRae, CEE
33. Paul Mayewski, CCI
34. Neal Pettigrew, SMS



## I PhD Tentative Faculty Biographies

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### INITIAL PLANNING COMMITTEE

#### 1. Mukhopadhyay, Sharmila: Professor & FIRST Director, Convener

sharmila.mukhopadhyay@maine.edu



##### Research Areas:

- Multifunctional nanomaterials: design, synthesis, characterization and testing
- Compact lightweight components for energy, environment, and biomedical applications
- Surface and interface phenomena
- Multidisciplinary engineering research and education

#### 2. Gardner, Douglas: Professor

douglasg@maine.edu

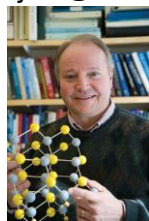


##### Research Interests:

- Wood Adhesion and Adhesives
- Wood-FRP Hybrid Composites
- Wood-Plastic Composites
- Cellulose Nanocomposites

#### 3. Lad, Robert: Professor

rjlad@maine.edu



##### Research Interests:

- Surface and Interface Properties of Materials
- Synthesis and Processing of Ceramic and Semiconducting Thin Films
- Electronic Properties of Materials;
- Thin Film Sensor Materials
- Metal-Ceramic and Ceramic-Ceramic Interfaces
  - Defect Microstructure of Materials
  - Scanning Probe Microscopy
  - X-ray Diffraction
  - Tribology of Hard Coatings
  - Reactivity and Degradation of Ceramic Surfaces and Films
  - Chemical Gas Sensors
  - High Temperature Materials

#### 4. Neivandt, David: Professor

david.neivandt@maine.edu

**Research Interests:** Determination of the orientation and conformation of interfacial species • surface spectroscopies/microscopies



#### **Current Research**

- Determination of the Orientation and Conformation of Interfacial Species
- Surface Spectroscopies/Microscopies
- Conformational Studies of Lipid Molecules Comprising Model Membranes
- Polymer Templating in Surfactant Monolayers

#### **5. Pereira da Cunha, Mauricio: Roger Clapp Castle and Virginia Averill Castle Professor of Electrical and Computer Engineering**

mdacunha@maine.edu



#### **Research Interests**

- Microwave Acoustics
- Surface and Bulk Acoustic Wave Propagation and Devices
- Biosensors
- Harsh Environment Sensors
- Acoustic Wave Material Characterization and Analysis.

#### **6. Tripp, Carl: Professor**

ctripp@maine.edu



#### **Research Interests:**

- Materials and sampling methods for optical based sensors
- Layer-by-layer deposition
- Sol-gel synthesis of nanostructured metal oxides
- Biomembranes
- Surfactant/polyelectrolyte adsorption on pigments
- Surface reactions in supercritical fluids
- Particle-particle interactions
- Electroluminescent and solar cell devices

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### **FACULTY MEMBERS**

#### **7. Amar, François: Professor**

amar@maine.edu



#### **Research Interests**

- Structure and dynamics of nanoclusters
- Simulation methods for reaction kinetics and dynamics
- Theory for catalysis and upgrading of biofuels
- Chemistry education research
- Models for interdisciplinary education and research

### 8. Apul, Onur: Assistant Professor

onur.apul@maine.edu



#### Research Interest:

Dr. Apul's research focuses on responsibly harvesting nanotechnology to advance safe and sustainable water treatment. He specifically investigates molecular level interactions at the boundary layers to help tackle emerging environmental concerns (such as PFAS in drinking water sources or microplastics in coastal ecosystems).

### 9. Edalatpour, Sheila: Assistant Professor

sheila.edalatpour@maine.edu



#### Research Areas:

- Near- and far-field radiative energy transfer
- Computational heat transfer
- Electromagnetic light scattering
- High performance computing
- Thermal energy transport at micro/nanoscale

### 10. Emanetoglu, Nuri: Associate Professor

nuri.emanetoglu@maine.edu



#### Research Interests

- Novel semiconductor materials and devices
- Optoelectronics & photonics
- Piezoelectric materials, thin films and devices
- Surface acoustic wave devices and thin film resonators
- Sensors, based on both semiconductor & piezoelectric devices

### 11. Frederick, Brian: Professor

briangf@maine.edu



**Research Interests:** The group develops hydrodeoxygenation catalysts that will produce fuels and valuable chemicals from woody biomass. They utilize a variety of experimental and theoretical methods, including in-situ spectroscopic and high pressure catalyst characterization methods, surface science techniques, quantum chemical calculations and statistical simulations. The research group is very multi-disciplinary, spanning physics, chemistry, and chemical engineering.

### 12. Hess, Samuel: Professor

samuel.hess@maine.edu



#### Research Interests:

- Experimental and Theoretical Biophysics
- Fluorescence Microscopy and Spectroscopy
- Function and Lateral Organization of Biomembranes
- Single Molecule Fluorescence Photophysics
- Green Fluorescent Proteins.

**13. Howell, Caitlin: Assistant Professor**

caitlin.howell@maine.edu



**Research Interests**

- Biointerfaces
- Bio-Inspired Technology Development
- Bacterial and Fungal Biofilm Formation and Control
- Biomolecular Surface Interactions
- Mammalian Cell Surface Interactions

**14. Khoda, Bashir: Assistant Professor**

bashir.khoda@maine.edu



**Research Areas:**

- Digital Manufacturing
- CAD/CAM/CAE
- Additive Manufacturing/ 3D Printing
- Bio-Manufacturing

**15. Landis, Eric: Professor**

landis@maine.edu



**Research Interests:**

Eric's research interests are in experimental mechanics and fracture, with particular focus on the use of innovative laboratory techniques to solve problems of fracture and failure in cement-based and wood-based composite materials. He also dabbles in computational modeling, biomimetics, and burrowing marine invertebrates. He has particular expertise in x-ray computed tomography and associated 3D image processing, as well as a background in quantitative acoustic emission analysis techniques.

**16. Li, Ling: Assistant Professor**

Ling.li@maine.edu



**Research Interests:**

- Innovative technologies to improve the energy efficiency of the energy-intensive wood industry and timber-based building sector
- Advanced carbon-neutral bioproducts, such as engineered wood products and mass timber panel products
- Numerical analysis of hydrothermal behavior of wood and engineered wood products
- Utilization of sustainable and renewable biomass as bioenergy resources.

**17. Meulenberg, Robert: Associate Professor**

robert.meulenberg@maine.edu



**Research Interests:**

- Electronic structure of nanoscale materials
- Surface and interfacial physics of nanostructures
- Novel materials for alternative energy applications

- Magnetometry and magnetic materials
- Synchrotron radiation (x-ray absorption, photoemission, and emission)

**18. Schwartz, Thomas: Assistant Professor**

thomas.schwartz@maine.edu



**Research Interests**

- Heterogeneous Catalysis
- Reaction Kinetics
- in situ and operando Spectroscopy
- Biomass Conversion
- Biorenewable Chemicals

**19. Tajvidi, Mehdi: Associate Professor**

mehdi.tajvidi@maine.edu



**Research Interests:**

- Adhesion mechanisms involved in hybrid mycelium-CNF-wood composites
- Pilot-scale production of building products using cellulose nanomaterials
- Heavy metal removal from water using cellulose nanofibril-based filters
- Contact-dewatered CNF as additive for additive manufacturing feedstock
- Enhancing barrier properties of cellulose nanofibril films under extreme conditions
- Development of food serving containers using cellulose nanofibrils
- Viscoelastic behavior of cellulose nanocomposites exposed to varied environments

**20. Vetelino, John: Professor**

john.vetelino@maine.edu



**Research Interests**

- Microsensors
- Microacoustics
- Solid State

**21. Yang, Yingchao: Assistant Professor**

yingchao.yang@maine.edu

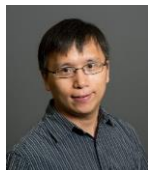


**Research Areas: ([The Nanomaterials & Nanomechanics Laboratory](#))**

- Structural and Multifunctional Nanocomposites
- Hierarchical Structures
- Biomass for Energy Materials
- Mechanics of Low-Dimensional Nanomaterials
- Design and Fabrication of Micro-/Nano-Devices

**22. Yu, Liping: Assistant Professor**

liping.yu@maine.edu

**Research Interests:**

- Condensed Matter and Materials Theory
- Inverse design of materials for energy and electronics
- Density functional theory and first-principles computation
- Point defects in solids
- Surface and interface properties of materials
- Catalysis, photovoltaics, and energy storage
- Two-dimensional materials for flexible electronics

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**ASSOCIATE (COLLABORATING) FACULTY MEMBERS****23. Bousfield, Douglas: Calder Professor, Director of the Paper Surface Science Program, Graduate Coordinator**

bousfld@maine.edu

**Research Interests**

- Fluid mechanics
- Rheology
- numerical methods
- coating processes

**24. Bruce, Alice: Professor and Chair, Dept of Chemistry**

abruce@maine.edu

**Research Interests:**

- the influence of gold(I) and zinc(II) on thiolate-disulfide exchange
- redox properties of sulfur-containing molecules
- electron transfer between ferrocene and gold(I)-thiolate complexes
- derivatization of ferrocene with thiosemicarbazides and the interaction with metal cations
- the use of analogies in general chemistry labs to help students make connections between macroscopic and atomic level phenomena

**25. Bruce, Mitchell: Professor**

mbruce@maine.edu

**Research Interests:**

- Metal-Sulfur Chemistry and Auophilicity
- Detection of Metals in the Environment
- Energy Research
- Chemical Education

**26. Cole, Barbara: Professor**

cole@maine.edu



**Research Interests:**

We are investigating means of cleaving the lignin-carbohydrate bonds that prevent efficient separation of the wood components and thus limit their utilization. In other words, we are developing methods to separate the major components of wood so that it can be used more efficiently for high value products and energy production.

**27. Dagher, Habib: Executive Director of the Advanced Structures & Composites Center**  
hd@maine.edu



**Research Interests:**

- The large- scale bio-based additive manufacturing program
- Floating offshore wind technology research program
- Development of unique research facilities
- Transportation Infrastructure Durability Center
- Other composite technologies include The Modular Ballistic Protection System (MBPS) & the longest carbon-fiber composite vessel built for the US Navy

**28. Gramlich, William: Associate Professor**  
william.gramlich@maine.edu



**Research Interests**

- Polymer chemistry and synthesis
- Sustainable polymers and composites
- Biomaterials for cellular regeneration, development, and differentiation
- Coatings to prevent biofouling and infection
- Next generation paper coatings

**29. Hejrati, Babak: Assistant Professor**  
babak.hejrati@maine.edu



**Research Areas:**

- Robotics and Robot-Assisted Gait Rehabilitation
- Controls and Dynamic systems
- Biomechanics and Motion Analysis
- Haptics and Virtual Reality
- Mechanical Design and Manufacturing

**30. Kreutz, Karl: Professor**  
karl.kreutz@maine.edu

**Research Interests:**



My primary research interest is the Earth’s climate history. Much of my work focuses on atmospheric and hydrologic dynamics in high-latitude and high-elevation regions through a combination of modern process studies and ice core recovery and analysis. My main research tools are gas-source isotope ratio and inductively coupled plasma mass spectrometers housed in the Stable Isotope Laboratory and ICP-MS Facility.

### 31. Kurbatov, Andrei: Associate Professor

akurbatov@maine.edu



#### Research Interests:

My primary research focuses on understanding the Earth's volcanism and climate. Volcanism is one of the important climate forcing component. Unfortunately, only limited instrumental and sporadic observational data of global volcanism are available. One of the most robust methods to reconstruct details of the impacts of volcanism on the past atmosphere (climate) is to study volcanic products (e.g., tephra and aerosols preserved in ice cores). Such volcanic products are found embedded into the snow on polar ice caps, and allow us to reconstruct the source, magnitude and timing of volcanic eruptions. Sampled layer by layer, ice cores capture paleoclimate records, including impacts of volcanic events.

### 32. MacRae, Jean: Associate Professor

jean.macrae@maine.edu

#### Research Interest:



- Microbial processes that affect pollutant and nutrient cycling, sustainability issues and access to water and sanitation in the developing world.
- Influence of microbial populations on arsenic mobility in groundwater
- Decision tools to support water resources sustainability of managed lake systems
- Adsorption of As to a variety of adsorbents
- Sustainable water and wastewater systems for the developing world

### 33. Mayewski, Paul: Professor, Director of Climate Change Institute

paul.mayewski@maine.edu



#### Research Interests:

- human impacts on the chemistry of the atmosphere
- modern Antarctic and Himalayan ice loss
- abrupt climate change
- the impact of climate change on past civilizations
- the impacts of modern abrupt climate change

### 34. Pettigrew, Neal: Professor

nealp@maine.edu

#### Research Interests:



The focus of my research program is the dynamics and kinematics of coastal circulation features and processes, and the coupling between biological and physical oceanographic processes in coastal regions. The scientific approach combines intensive field studies with statistical analysis and the theoretical techniques of fluid dynamics. My research studies are carried out in environments ranging from estuaries and sea straits, to continental shelves, gulfs, and marginal seas.



**DRAFT**  
**GRADUATE FACULTY OF MATERIALS SCIENCE & ENGINEERING**

*Note: This is a suggested draft for initial discussion, and needs to be ratified and voted upon before it is formally adopted.*

**Article I: Description**

The Graduate Faculty of Materials Science & Engineering of the University of Maine is an interdisciplinary faculty comprised of members from various departments at the University as well as from other universities and research institutions in the state of Maine.

**Article II: Purpose and Intent**

The principal purpose of the Graduate Faculty is the administration of the graduate program leading to the Interdisciplinary Doctor of Philosophy degree in Materials Science and Engineering, in conformance with the rules of the Graduate School of the University of Maine. The organization also serves to promote and facilitate communication among faculty and researchers working in the area of Materials Science and Engineering. It arranges for the periodic assembly of faculty and researchers and provides a forum for them and for others with interests in Materials Science and Engineering. The organizational and operational characteristics of the Faculty of Materials Science and Engineering are intended to be broad enough to permit consideration of all academic aspects of Materials Science and Engineering and all other matters affecting the position and progress of the discipline at the University of Maine.

**Article III: Membership**

1. The Graduate Faculty of Materials Science and Engineering shall be comprised of Full Members and Associate Members. Admissibility to the Faculty shall be determined by the Executive Committee after nomination by the head of the faculty member's administrative unit. All Graduate Faculty appointments are approved by the Graduate School of the University of Maine.
2. Only faculty and researchers with significant academic or research experience in disciplinary areas related to Materials Science and Engineering are eligible to be Full Members of the Graduate Faculty of Materials Science and Engineering.
3. Members of the Graduate Faculty who are interested in the activities of the Materials Science and Engineering Faculty, but who do not qualify for or desire Full Membership are eligible to become Associate Members. Only Full Members are eligible to:
  - a. chair the advisory committee of a Materials Science and Engineering graduate student
  - b. serve on the Materials Science and Engineering Executive Committee
  - c. vote on matters requiring a vote of the Graduate Faculty of Materials Science and Engineering
  - d. chair standing or *ad hoc* committees of the Graduate Faculty of Materials Science and Engineering
4. Membership in the Materials Science and Engineering Faculty will be reviewed every 5 years. To maintain full membership faculty must be actively involved in both teaching and research in the Materials Science and Engineering program.

**Article IV: Executive Committee**

1. The Executive Committee shall consist of Full Members of the Graduate Faculty of Materials Science and Engineering.
2. Members of the Executive Committee shall serve for three years and may be re-appointed.

3. The Executive Committee shall elect from among its membership a chair, a vice-chair and a secretary to serve for the ensuing year. The chair shall be elected for a two-year term.

4. The Executive Committee shall fill any vacancies that may occur in its membership or offices between the annual elections.

#### **Article V: Functions of the Executive Committee**

The principal functions of the Executive Committee shall be to:

- a. Determine and implement policy for the good of the Graduate Faculty of Materials Science and Engineering and represent the interests of the faculty generally to various University groups and other agencies.
- b. Coordinate the graduate curriculum in Materials Science and Engineering and receive and review the recommendations of the Curriculum Committee with the aim of insuring uniform excellence in the University of Maine Materials Science and Engineering program.
- c. Rule on the acceptability of applicants for graduate study in Materials Science and Engineering and make decisions regarding the awarding of competitive financial support.
- d. In consultation with the faculty and departments concerned, recommend class schedules and teaching assignments in all Materials Science and Engineering courses.
- e. Receive and rule on the admissibility of nominations for membership in the Faculty of Materials Science and Engineering.
- f. Conduct all additional business deemed necessary for the proper functioning of the Faculty including the establishment of standing and special committees.

#### **Article VII: Functions of the Officers**

##### 1. Chair

The chair is the chief officer and representative of the Executive Committee and the Graduate Faculty of Materials Science and Engineering. The chair's primary responsibility is the execution of those administrative functions that are delegated to the Graduate Faculty of Materials Science and Engineering. The chair shall:

- a. Chair the Executive Committee of the Graduate Faculty of Materials Science and Engineering.
- b. Provide leadership in short- and long-term planning for the program and represent the faculty group in College and University meetings, as appropriate.
- c. Coordinate recruitment of graduate students into the graduate program in the discipline.
- d. Approve degree programs, thesis and dissertation proposals, and theses and dissertations of Materials Science and Engineering graduate students for the Materials Science and Engineering Graduate Faculty.
- e. Appoint, with approval of the Executive Committee, the chair and other members of any standing committees and special committees.
- f. Ensure that teaching evaluations are done for Materials Science and Engineering courses.

##### 2. Vice-Chair

The vice-chair shall serve as chief officer of the Faculty of Materials Science and Engineering in the absence of the chair or when designated by the chair.

### 3. Secretary

The secretary shall prepare and distribute minutes of the Faculty of Materials Science and Engineering and the Executive Committee meetings and maintain appropriate records of Faculty and Executive Committee activities. The secretary shall prepare a report for distribution to the Faculty at the beginning of each semester (Fall and Spring semesters).

### **Article VIII: Meetings**

1. The annual meeting of the Faculty of Materials Science and Engineering shall be held in the Spring of each year.
  - a. Special meetings of the Faculty of Materials Science and Engineering may be held at the call of the chair or by written application to the Executive Committee by five Full Members of the Faculty of Materials Science and Engineering
  - b. A regular meeting of the Executive Committee shall be held each fall and spring semester. Other meetings of the Executive Committee may be held as frequently and for such purposes as are deemed desirable by the Executive Committee.
2. The minutes of each Faculty and Executive Committee meeting shall be distributed to all members of the Faculty of Materials Science and Engineering e-mail within 10 days after approval by the Executive Committee.
3. A quorum for Executive Committee meetings shall consist of 50% members of the Committee. Twenty-five percent of the Full Members shall constitute a quorum for meetings of the Faculty of Materials Science and Engineering.

### **Article IX: Standing Committees**

The members of each standing committee shall be appointed prior to September 1 of each year and shall serve from September 1 through August 31.

#### 1. Committee on Membership

The Committee on Membership shall consist of three Full Members. It shall screen applications for membership in the Faculty of Materials Science and Engineering and make a recommendation to the Executive Committee as to the acceptability of each applicant. Membership shall be conferred by approval of the Executive Committee. The Committee on Membership shall also review the active status of all members on a five-year basis.

#### 2. Graduate Curriculum Committee

The Graduate Curriculum Committee shall consist of three or more Full Members. It shall have responsibility for reviewing courses and programs in Materials Science and Engineering and making recommendations for changes and new courses to the Executive Committee as appropriate. The Committee shall also be responsible for the review of teaching quality and effectiveness.

### **Article X: Amendments**

Proposed amendments to the Bylaws shall be submitted to the Full Members of the Faculty of Materials Science and Engineering for approval or disapproval following either (1) approval of a motion to do so by majority vote of the Executive Committee or (2) written petition to the Executive Committee by a minimum of five Full Members of the Faculty of Materials Science and Engineering. Approval by two-thirds or more of the Full Members voting in a mail ballot is required to adopt amendments.

UNIVERSITY OF MAINE SYSTEM  
SUBSTANTIVE CHANGES TO EXISTING PROGRAM  
PROPOSAL

Graduate  
 Two-Year  
 Four-Year

**University of Maine**  
**College of Natural Sciences, Forestry & Agriculture**

- Title:** Masters of Science in Financial Economics  
**Degree:** Masters of Science  
**Area:** Financial Economics  
**CIP Code:** FIE-MS: 45.0601 Economics, General  
**CIP Code:** FIE-MS: 45.0603 Econometrics and Quantitative Economics

- Person Responsible for Planning**

**Name:** Sharon Klein, Graduate Coordinator  
**Department:** School of Economics  
**Address:** 200 Winslow Hall  
**Telephone:** 581-3174

- General Objective of Proposal**

The School of Economics has 3 main objectives with this proposed graduate program modification: 1) update the Financial Economics (FIE) degree to reflect existing course offerings; 2) change the FIE degree from a Master of Arts to a Master of Science; 3) add a thesis option to the FIE degree. We consider these changes to be a single substantive change to our current FIE MA for the reason that we are not adding courses or content, but simply converting the FIE MA non-thesis to a FIE MS with thesis and non-thesis options, using existing courses for degree requirements.

- Documented Evidence of Need**

The need that drives our proposal to update the FIE degree to reflect existing course offerings arises from recent changes in course offerings in both the School of Economics (SOE) and the Maine Business School (MBS). SOE recently sunset the course ECO 524

Advanced International Finance, which was one degree requirement for the FIE-MA. SOE also recently added ECO 553 Financial Economics as a new course. Therefore, ECO 553 will take the place of ECO 524 in the degree requirements. SOE also has been more regularly offering, and recognizes the common need for, time-series econometrics in a Financial Econ program. Therefore, ECO 532 Applied Time Series Econometrics will be added as a requirement and ECO 531 Advanced Econometrics and Applications, which is not as essential to the field of Financial Economics, will be removed. Students can still choose to take ECO 531 as an elective if it is important for their educational and professional goals. As the MBA program has become redefined over recent years, course offerings in the MBS have changed. To allow for maximum flexibility for FIE students to access the benefits the updated MBS offers in terms of course selection, we plan to expand the requirement of 2 business courses from the list of 3 courses (MBA 652, 653, 654) to a list of 6 courses (MBA 609, 623, 629, 651, 652, 653, 654).

The need that drives our proposal to update the FIE degree to a MS instead of a MA arises from two consistent observations over the past 5-10 years: 1) more and more prospective applicants requesting a MS option and existing students switching from the FIE-MA to the ECO-MS in order to get the MS degree in a more roundabout way; 2) faculty financial economics research needs moving in a more quantitative direction, requiring the technical skills of a MS degree rather than MA. In addition, with two econometrics courses and the new Financial Economics course, the degree by the nature of its requirements IS a MS rather than MA as these classes require research and technical skills. Recognizing this true nature of the degree has an added benefit for international students who pursue the FIE (which has happened a lot in recent years) by allowing them to achieve the extended 3-yr Optional Practical Training (OPT) because the FIE-MS will be an [approved STEM degree](#). Adding a thesis option naturally fits with this change to recognize the STEM aspect of the FIE degree. With more research- and technical-skill-focused classes and assistantship duties, many FIE students are requesting a thesis option, which does not currently exist with the current FIE-MA. Current FIE students who want the extended OPT and/or thesis option have to switch to the ECO-MS to get these benefits even though their focus is Financial Economics, and it is important to their career goals to have Financial in the name of their degree.

These changes more fully recognize the true nature of the FIE program at UMaine as it is being taught and offer more flexibility and opportunities to existing students and future applicants.

**Rationale**

A Master’s in Science in Financial Economics would technically be a ‘new’ graduate program. However, the proposed curriculum is substantially reflected in the current MA program, as discussed above. Importantly, we will not offer any new courses as a result of this proposed change.

Moreover, we believe that none of the changes represent a significant departure from our current Master’s degrees, either in content or in method of delivery. Nor are we proposing here to change the geographic area in which the degrees are offered. Thus, these changes do not constitute ‘substantive changes,’ by the criteria of Section 305.2 “Substantive Changes to Existing Academic Programs” of the University of Maine System Administrative Procedures Manual.

**Program Design**

The following table lays out the current and proposed degree requirements and thesis option.

	<b>Degree Requirements</b>	<b>MA (current)</b>	<b>MS (new)</b>
<b>CORE COURSES</b>	511 – Macroeconomics (cr hrs)	1 (3)	1 (3)
	514 – Microeconomics	1 (3)	1 (3)
	530 – Econometrics	1 (3)	1 (3)
	531 – Advanced Econometrics	1 (3)	
	532 – Time Series Analysis		1 (3)
	524 – International Finance	1 (3)	
	553 – Financial Economics		1 (3)
	MBA 651 – Financial Management	1 (3)	
<b>ELECTIVES*</b>	ECO Graduate Electives (cr hrs)	2 (6)	3 (9)
	MBA Finance Courses	2 (6)	2 (6)
<b>THESIS OPTION</b>	ECO 699 Research (*substitute)		2 (6)
	<b>TOTAL CREDITS</b>	<b>30</b>	<b>30</b>

5. **A. Which campuses, agencies, organizations, institutions or individuals have you involved or do you plan to involve in the program?**

None beyond the School of Economics at the University of Maine. These changes align well with ongoing substantive changes to the MBA program recently proposed.

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

All support required for this program is already available. No additional support would be required for this change.

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

In keeping with our current evaluation efforts we will evaluate the success of the new program over time as we do with all our graduate degrees. We keep records of student progress and degree success, from graduate applications, to yearly student progress, to graduation and job placement. We also keep records of alumni career positions. These data, as well as the more frequent evaluations of faculty advisors, help us to ensure not only that each student is in the program best-suited for her or his interest and abilities, but also that the degrees themselves best represent the true demand.

**8. Time Frame**

Estimated Planning Time:	none
Estimated Implementation Time:	none
Estimate of Program Lifetime:	15-20 years

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

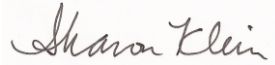
There are no other economics graduate degrees offered in any other University of Maine System campus.

Because of the rigorous nature of our graduate program, graduate students strongly prefer to work together and study in groups. This social support, and the support provided by second year students makes completing an economics graduate degree very difficult without being physically present on campus. As a result, graduate students prefer to attend our graduate economics degrees at UMaine in person, and as a result of that, we do not have plans to offer these degrees online at this time.

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



**11. Submitted By:**



April 14, 2021

Sharon Klein, Graduate Coordinator, School of Economics

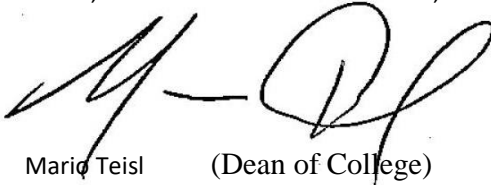
**Approved By:**

KPB

April 15, 2021

\_\_\_\_\_  
(Department Head) (Date)

Kathleen P. Bell, Interim Director and Professor, School of Economics

  
Mario Teisl (Dean of College)

April 16, 2021

(Date)

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(Dean of Graduate School)

(Date)

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(Chief Academic Officer)

(Date)

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(President) (Date)