THE UNIVERSITY OF MAINE
Graduate School

Graduate Board
Room 57, Stodder Hall
Thursday, January 30, 2020
3:00 pm – refreshments
3:15 pm - meeting
AGENDA

1. Review/approval of the December 19, 2019 Graduate Board minutes

2. Review/approval of the January 7, 2020 Curriculum Committee report

3. Announcements/updates:

    - 2 Waldron, 2 Hunter and 6 CDRA award recipients:
      Waldron: Shelby Helwig and Frankie St. Amand
      Hunter: Cory Johnson and David Smith
      CDRA: Hannah Mittelstaedt, Peter Strand, Sohaib Alahmed, Ming Tso Chien, An Nguyen, and Natalie VanderAkker.

    - Progress on program learning outcomes
    - Prioritization of doctoral students in assistantship awards
    - Mid Semester Check-in Results
        - Upcoming Graduate School Events – Flyers included in the packet for:
          3MT: Jan 31-2:30pm, Feb 4 – 10:00am, Feb 6 – 12:00pm
          Mind Spa / Wellness Workshops – last Tuesday of each month
          Thesis Formatting – March 3; 12-1, 57 Stodder Hall
          February Mug Club – Feb 6; 4-6 Career Center

          February Event List:
          Feb 5 – Career Fair, 10-3, Rec Center
          Feb 6 – Mug Club, 4-6, Career Center – Diversity and Inclusion Training
          Feb 10- Fresh Check, 11-2, Memorial Union (Suicide Prevention/Awareness)
          Feb 20 – Public Speaking, 12pm, 57 Stodder
          Feb 25 – Wellness Workshop, 12pm, Mind Spa – Memorial Union
          Feb 27 – Difficult Conversations, 12pm Career Center

4. Review of program/curricular changes:

    - Graduate Certificate in Computational Thinking and Computing Education
    - EDT 571: Methods of Integrating Inclusive Computational Thinking
    - Graduate Certificate in Library and Media Specialist
    - Graduate Certificate in Business Analytics
    - Graduate Certificate in Maine Arts/Humanities and Medicine
    - MS in Data Science and Engineering

4. Items arising

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3:00 pm – refreshments
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AGENDA

Meeting called to order at: 3:20 PM

Attendees: P. Agrrawal, J.Artesani, J.Ballinger, J. Bonnet, S. Butler, S. Delcourt, D. Dryer, P. Edelman, S.Ell, K.Evans, N.Hall, S. Jain, A. Knightly, A. Knowles, M. Larocque, I.Mette, E. Pandiscio, P.Poirier, L. Rickard, O. Smith, C. Sponarski, J. Stoll, K. Vekasi, C. Villacorta Gonzales, V. Weaver, T. Yoo.

Guests: Joyce Rumery and Deborah Rollins – Fogler Library
Crystal Burgess from the Graduate School

1. Review/approval of the November 21, 2019 Graduate Board minutes
   - Motion to approve – Owen Smith
   - Andy Knightly found a discrepancy – 1 v – Page 2 & 3 – duplication under bullet 3 (regarding Shaleen's statement)
   - Unanimously approved with amendment – with one abstention – Nancy Hall

2. Review/approval of the December 10, 2019 Curriculum Committee report
   New Courses:
   - BUA 680 Foundations of Business Intelligence and Analytics
   - BUA 681 Data Management and Analytics
   - BUA 682 Data Pre-Processing for Business Analytics
   - BUA 683 Information Visualization
   - BUA 684 Business Data Mining and Knowledge Discovery
   - BUA 685 Problem Solving and Decision Analysis
   - BUA 686 Predictive Analytics and Business Forecasting
   - EEL 585 Reflective Practice within MPCL Coaching
   - NUR 675 Philosophical Foundations and Ethical Decision Making Frameworks for Advanced Practice Nursing. The course can be offered one time without formal approval (Experimental Course).

   Modifications:

   - HED 580 History of Higher Education in the United States – (changing prerequisites only – to make it easier for Higher Ed students to register for the class without permission.

- Jamie is here to talk about the MBA programs today.
  USM courses moving to UMaine in the new MBA program. Some are new faculty, most are elective courses.

  Motion to accept Curriculum Committee report – Sandy Butler & seconded by Owen Smith
  Question was asked about who would be teaching the courses – and Jamie answered that there would not be further burden on current faculty – there has been new faculty hired.

  Unanimous Approval.

3. Announcements/updates:

- Graduate student research projects related to unified accreditation – Emailed to Scott by the President – regarding unified accreditation with respect to Graduate Faculty appointments. It is pretty rare to have unified accreditation within a state university system. President was wondering if anyone might be interested in doing a thesis or dissertation topic relating to unified accreditation since it would make an interesting research topic related to change in higher education. There are issues relating to human resources, finance, academic programs, communication etc… there are potentially alot of topics to pursue. Are there any programs interested in pursuing this? Please think about it and let Scott Delcourt know if there is any interest. President will identify funding for 1-2 years for an assistantship for this purpose.

- Progress report on program learning outcomes – concerns from NECHE regarding tracking program learning outcomes at the graduate level. Debra Allen, Mandy Barrington, and Ryan Weatherbee all from Institutional Research have recently met with the Graduate Executive Committee to begin a discussion of developing overarching program learning outcomes for the Graduate School. Program learning outcomes sit between course learning outcomes below and the Graduate School mission and goals above.

  Can we develop a set of outcomes that would be true of all graduate programs? (PhD, Masters, and Certificate) If the goals are broad enough, we would be able to specify a set of outcomes that reflect those goals. Learning outcomes to reflect the goals of the program. Institutional Research will come up with a summary to bring to Executive Committee – and once approved, it will come to Graduate Board.

  One possible model – largest circle = Doctoral / within = Masters / within = Certificate programs. Could all of it be inclusive in that manner?

- Grants Workshop (January 13 and January 16, 2020) – 3rd annual Grants Workshop.
  13 & 16th – Grants Workshop
  14- Jen Bonnet will do her usual presentation on Grants 101 in the library.
  15th - Writing Workshops with Paige Mitchell.

- Mug Club on January 23 (Valentine project – resilience)

- Mind Spa workshops – wellness workshops - handouts sent around

- TA Boot camp – an extension of TA orientation that takes place in the fall – Karen Pelletreau – professional development for graduate students. (Teaching Academy for more experienced TA's)

- New fields on graduate application – Crystal Burgess

  i. Some fields for certificates and readmits.
  ii. Supplemental application materials are widely available if needed. (not required fields)
  iii. Additional information section – if relevant – student will have the opportunity to indicate what research topics of interest that they have.
  iv. Potential mentor match
  v. One Health and the Environment – NRT Program
  vi. Indicate System School benefit – application waiver (our system school applications started are up 91% and applications submitted from system schools are up 158%). Fee waiver is on our web-site – you can advertise it for system schools.

  If you have questions about adding fields to the application, please see Crystal.

  Owen asked about why the new questions are listed as optional – Jacqueline Gill stated that there are a lot of applicants that would be getting confused. (Items with a dot next to them are required).
  Laura Rickard stated that her program asks for this information in the essay.
  Owen stated that he asks students not to have an advisor before applying.
  Crystal stated that she will work on the application logic and see if she can make it more program specific.

- New - Exit interviews for students withdrawing from Graduate School – relating to retention.
  i. Scott Delcourt noted that Kathryn Rossignol (Student Success Manager) will be coordinating this effort. (This was a request from the President to get more current feedback as opposed to tracking outcomes only for degree recipients.)
  We would love the help of the programs – to point out students thinking about leaving and connect them with Katie.

  We should add a question regarding funding.

  Jacquelyn Gill mentioned that her department is also introducing exit interviews and there is a possibility to coordinate information gathering.

  We can work with programs who are already completing exit interviews.
  (Nursing, Social Work, and a few others are currently doing informal exit interviews)
  Kristen Vekasi is also doing them in her department.

  It might be helpful for Katie to talk with the programs to see if the reasons for students leaving are consistent and to reduce duplication in efforts

- Graduate Student Employment – Handbooks & Employment Listings – Kathleen Harding-Heber presented.
  Template award letter – student signs it – accepts the terms and conditions.
  The handbook is simply a resource – use as much or as little as you'd like.
  Please use the award letter template so that students and programs have a common understanding.
  Time off – S. Delcourt stated that the Council of Graduate Schools stated that the norm for time off for graduate assistants is all holidays off and two weeks a year.

Shaleen stated that during the semester – students have a full course load – and work less during the school year and more during breaks. The handbook can be altered to fit the department needs Please let the Graduate School and the Career Center know when you have a position available so that we can list the opportunities for all students to have access. We would list for 30 days unless department requested an extension.
Suggested break and vacation policy would be standard University Holidays and 2 weeks of vacation during the assignment.

Research Assistantships could be an exception – if a student is on a trip, etc…

- Full Graduate School Commencement will be on Friday and will include all Graduate Students – May 8 at 4:00 PM.

- Student Symposium will be at the Alfond Arena this year (not at the Cross Center) - there is another commitment at the Cross Center that would not allow us to get in the night before or to stay beyond 5PM the day of the Symposium. April 17th – at the Alfond.

- 3 Minute Thesis – 4th annual competition this year. We had about 18 compete last year. It has been growing each year. Look for an announcement from the Graduate School.

- Dr. David Harder – hired through VPRDGS – to work on UMaine Medicine initiative. One of the ideas he is working on is to bring a Master of Public Health program to the greater Bangor area. (USM already has a MPH program.) We would like to reach an agreement with USM to collaborate in the MPH program. This collaboration could take many forms from a jointly offered program to UMaine collaborating in USM's program, much like USM does in the MBA. Town hall meeting will be forthcoming to share ideas. Email Scott Delcourt if you are interested in being included in this meeting.

4. Review of program/curricular changes
    - MBA 4+1 pathways with USM, UMPI and Colby College
        a. Because these are pathways, formal Graduate Board approval is not necessary. The agreements simply guarantee an expedited admissions process for the MBA.
        b. Jamie – UMPI, USM and Colby. There are five different pathways some for business and some for non-business majors.
        Anne Knowles asked about a "pathway" – Jamie stated that it is an outline of what a student needs to do in order to gain entry to the graduate program.

        For a formal accelerated program (i.e. 4+1) - some graduate credits can be completed while the student is an undergraduate and counted in both undergrad and graduate program – this is different than a simple pathway.

        UMaine has developed a number of internal accelerated programs, and there are a few 4+1 programs within the UMS. Owen is working on a 4+1 in intermedia with UMS schools. There is a 4+1 for a MEd in special education that is already in place between UM and UMM.

        Jamie stated that we have 50 students who were affiliated with USM who are interested in the pathway.

        MBA has been trimmed down to 30 hours – and doesn't allow us to double count credits.

5. Guests: Joyce Rumery and Deborah Rollins – Fogler Library update
    - Handout (in appendix to packet).
    - Library has resources greater than $75K. Throughout all sources, we provide access to over 133,000 journals to us.
    - No increase to the budget because 95% of our budget is serials. It means we have to make some cuts.
    - 2015 was the "golden era" of serials in the library.
    - The cuts are always based on usage.
    - Some of the journals are tied into packages of journals – and data bases
    - Book budget is almost $0
    - Questions?
    - Josh Stoll asked about whether or not there has been any thoughts of working with an outside organization to help with funding.
    - Elsivier Science Direct – has been a concern regarding open access
      Keep in mind about where you are publishing vs. who has open access.
    - Anne Knowles – asked about the percent allocated to books. Many book expenses have become serial expenses.
    - We have a robust interlibrary loan system – and are testing a system that would allow us to borrow e-books.
    - There is another new system that allows you to turn an ebook into an audio book.
    - Cancels were based on 0 usage in 3 years.
    - Terry Yoo – is a little concerned regarding scholarship – how to balance all of this and move forward. Message from University = try to do more with less. Is there a way to have the state help us make up the shortfall?
    - Joyce met with Faye to discuss R1 goals.
    - Jacquelyn Gill – what other libraries use our services for library loans, etc… assessment of how many books that we loan or send out.
    - University indirect cost rate is negotiated at the system level. Do you feel that our indirect cost rate is relative to what is needed. Joyce doesn't have a breakout of costs.
    - Individual journals – many were cut – and now we have to go back and cut some of the packages. Cuts need to happen in the summer – Deborah suggested that there could be involvement if people want to be involved from departments. We have not been publishing the lists of things we are proposing to cut.
    - Pank asked if there are other data bases that are paid services? Deborah responded that the services cut were not being used. Some of the data bases cost upwards of $80K for a subscription.
    - Wharton and other services require permission for students to access.
    - We do not have a data librarian or a scholarship librarian.
    - Library operating budget is $57,000 a year. Students, computers, services, etc…
    - Anne Knowles asked: Does the university have a budget for purchasing data? Deborah stated that there is no budget for that purpose.
    - Are we moving forward with the Research 1 initiatives? There is an electronic copy circulating of analysis of UMaine vs. other institutions.

6. Continued discussion of SVV document as it pertains to graduate studies:

Goal 1: We will support and grow Maine's economy through new discoveries and by building

a workforce whose members are engaged in their communities and prepared for lifelong success.

Subgoals to #1 include:

- Increased opportunities for experiential learning. What are the different kinds of experiential learning for graduate students?
- Increasing the number of graduate degree recipients to support workforce needs and the Maine economy.
- Collaborating with other UMS campuses in research, scholarship and graduate education

7. Items arising — Happy Holidays to everyone!

Meeting adjourned 5:02 PM

CURRICULUM COMMITTEE REPORT

The Curriculum Committee met on January 7th, 2020 and recommends the following courses to the Graduate Board for approval at its January 30th meeting.

New Courses:

EAD 663 Dissertation Proposal

EAD 664 Dissertation 1

SWK 585 History, Assessment and Interventions in Substance Use and Abuse

Modifications:

EDT 520 Digital Age Teaching and Learning Methods

EDT 531 Studio for Computing in Learning

EDT 561 Technology Supported Inquiry-Based Teaching and Learning

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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

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

GRADUATE PROGRAM/UNIT Educational Leadership

COURSE DESIGNATOR EAD COURSE NUMBER 663 EFFECTIVE SEMESTER Fall 2020

COURSE TITLE Dissertation Proposal

REQUESTED ACTION

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

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

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

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

ELIMINATION:

- [ ] Course Elimination

ENDORSEMENTS

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

Leader, Initiating Department/Unit(s)

Ian M. Mette

Digitally signed by Ian M. Mette
DN: cn=Ian M. Mette, o=University of Maine, ou=, email=ian.mette@maine.edu, c=US
Date: 2019.12.17 19:37:52 -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):

Dissertation Proposal (EAD 663) is a three (3) credit hour course that is designed to serve as the entry point into candidacy. EdD members will submit a finalized and written product in the form of a portfolio during the first two weeks of the course, followed by two weeks of oral defenses. The last four weeks of the course will be dedicated to creating and drafting an IRB proposal based on the success and feedback of the written and oral defense. The IRB proposal will consider a succinct literature review, sampling and participant selection, data collection and analysis procedures, and researcher role and biases. Competencies include making an argument about a problem of practice, connecting it to a developed review of the existing literature, sketch out a conceptual framework, and then use that framework to develop a methodological approach that will help answer the problem of practice. EdD members will also be expected to target a conference for later submission as a conference presentation. Prerequisites: Enrollment in EdD in Educational Leadership program or by permission.

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:

Terrell, S. R. (2016). Writing a proposal for your dissertation: Guidelines and examples. New York: Guilford Press. ISBN: 978-1-46252-302-3.

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

Dr. Ian Mette, Associate Professor in Educational Leadership, 2-2 teaching load

Reason for new course:

We have reestablished our EdD program, a professional degree that focuses on producing scholarly practitioners who are capable of closing the theory-practice gap in educational leadership. To accomplish these goals, we are offering two eight-week courses each semester as an intensive program of study for our educational leadership students. This course will meet the scheduling needs of the EdD program and help to dramatically improve degree completion rates. It will also provide support for EdD students to bridge the theory-practice gap in their own PK-12 contexts.

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

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

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

There are no other departments affected by this course development as there are no course overlaps. While no departments or programs have been affected, departments and programs will be aware of the development of this course through the COEHD Graduate Advisory Council (GAC). Additionally, this course development is required as currently there are no other eight-week EdD courses being taught. Moreover, we see the development of dissertation courses as vital to the effort to dramatically improve our dissertation completion rates.

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 once every two years as part of the EdD cohort program, which supports 12-15 EdD students in each cohort. If other COEHD programs see the need to use this type of course, it could be offered as needed throughout COEHD.

Mission Statement: Drawing on a rich tradition of excellence, the College of Education and Human Development at Maine's flagship university is committed to leading innovation in Maine's Pre-K-12 schools, higher education institutions, and agencies that support academic, cognitive, physical, social and emotional development. We promote effective teaching and learning, identify critical issues, conduct research, and disseminate findings. Collaboratively with external partners and experts across the University of Maine, we prepare our graduates to engage in ethical conduct, reflective practice, meaningful inquiry, and data-driven decision making in order to meet the increasingly diverse needs of our state and the world in which we live.

EAD 663: Dissertation Proposal
Fall 2020 Second Session (10/22-12/17)
159 Shibles
Thursdays, 4:00 PM – 8:30 PM

Ian M. Mette, PhD
334 Merrill Hall
ian.mette@maine.edu

Cell Phone: (207) 951-5659
Office phone: (207) 581-2733

General Description

The *Dissertation Proposal* course is designed to serve as the entry point into candidacy. EdD members will submit a finalized instrument to be used for data collection purposes, followed by an oral defense of their problem of practice. The last portion of the course will be dedicated to creating and drafting an IRB proposal based on the success and feedback of the oral defense. The IRB proposal will consider a succinct literature review, sampling and participant selection, data collection and analysis procedures, and researcher role and biases. Competencies include making an argument about a problem of practice, connecting it to a developed review of the existing literature, sketch out a conceptual framework, and then use that framework to develop a methodological approach that will help answer the problem of practice. EdD members will also be expected to target a conference for later submission as a conference presentation.

Purpose

This course focuses on the application of theory and methodology to solve problems of practice facing PK-12 educational leaders. The course is intended to not only determine if an EdD member can move into candidacy, but it is also intended to provide crucial support around the creation and submission of an IRB proposal. Therefore, the design of this course ensures EdD members have the supports needed to address a problem of practice and produce quality dissertation products that will help the education profession throughout the state and the country more broadly. By the end of the course, members will be able to:

1. Defend their entry into candidacy with written and oral expression that directly addresses their problem of practice.

2. Craft a succinct and concise literature review addressing a problem of practice, including their problem statement and purpose of the study.
3. Address methodological considerations, such as sampling and participant selection.
4. Clearly articulate data collection and data analysis procedures to address the problem of practice.
5. Address how to mitigate and acknowledge the role of the researcher and bias.

General Approach to Learning

The 2020 Fall Semester Second Session will go by quickly. Different from previous semesters, however, this course marks the departure from taking classes that teach cohort members new concepts, theories, frameworks, and methodologies, and instead asks EdD members to apply these to their own dissertation to address their problem of practice. As a cohort, you will continue to learn side-by-side with your colleagues from throughout the state, and as such your group experience will depend on your ability to support each other and provide feedback on the rigor of your work. Attendance in the class will continue to be crucial, as is coming prepared having completed all of the work that is being asked of you to keep you on your dissertation timeline. As such, you will progress through this semester – and the final upcoming semesters – by not just building your argument as to why your problem of practice is important, but how you have been able to address this as a scholarly-practitioner and how your work can inform other educators in the state and throughout the nation.

Attendance

Attendance in any class is important, but especially in an eight week course. Class members are allowed one absence per eight week class. ANY ABSENCE beyond the one allowed absence will automatically drop a final grade by one letter grade. More than two absences will result in a C, which is considered failing in graduate school. More than two courses with the letter grade of a C or below will result in removal from the EdD in Educational Leadership program.

Class Expectations

EdD class members should expect to average 10 hours of work outside of class each week to complete assignments, group work, readings, and course requirements.

Required Text:

Terrell, S. R. (2016). *Writing a proposal for your dissertation: Guidelines and examples*. New York: Guilford Press. ISBN: 978-1-46252-302-3.

Additional Readings:

As assigned throughout the course.

Class Sessions:

Thursday, October 22nd, 4:00 PM – 8:30 PM
Thursday, October 29th, 4:00 PM – 8:30 PM
Thursday, November 5th, 4:00 PM – 8:30 PM
Thursday, November 12th, 4:00 PM – 8:30 PM
Thursday, November 19th, 4:00 PM – 8:30 PM
Thursday, December 3rd, 4:00 PM – 8:30 PM
Thursday, December 10th, 4:00 PM – 8:30 PM
Thursday, December 17th, 4:00 PM – 8:30 PM

NOTE: Class members should fully expect to stay for the full four and a half hour block. We will take several breaks during these timeslots, but class members should also bring food and beverages to make sure they are alert and engaged during each four hour class.

Assignments

ASSIGNMENT	DUE	POINTS
Instrument Design	11/12	25
Oral Defense	12/3	25
IRB Submission	12/17	30
Class Attendance and Participation	ongoing	20
	TOTAL	100

Assignment Descriptions:

Instrument Design

- Based on the work you have read and the data you have analyzed throughout your methodology courses, EdD members will submit a finalized instrument design that will be used in their dissertation study. Members will need to address methodological considerations, such as sampling and participant selection, as well as a final instrument to be used in data collection that addresses the problem of practice they have selected. This assignment should result in roughly 1000 – 1500 words (12 point font, Times New Roman) describing the rational for the instrument, the instrument itself, and should serve as the foundation for how members will address their problem of practice. It is critical that EdD members provide additional pages for references (in APA style).

Oral Defense

- Each EdD member will formally defend her/his portfolio to the Educational Leadership faculty. During this defense, a majority (more than 50%) of the faculty must determine the portfolio (all products and qualifying paper) to be deemed successful. During this time, EdD members must be able to conduct what the program has called a Stand and Deliver, where the educator must be able to not only persuade the committee that the problem of practice is one that is important to address, but also answer questions after the presentation. The question and answer session after the Stand and Deliver would be similar to that which occurs after a conference presentation. Members have two opportunities to successfully conduct an oral defense. A second defense that is determined to be unsuccessful will result in the termination of the member's EdD program.

IRB Submission

- EdD members are expected to take the feedback from through this course and submit an IRB proposal that will allow them to start with data collection during the next semester once given official approval by the IRB. The IRB submission will cover all UMaine IRB requirements, including the appropriate submission forms and samples of IRB approved studies. Instructors will share their own successful IRB approved studies and help EdD students work closely with the UMaine IRB to gain approval for studies involving human subjects. The IRB proposal will include a succinct literature review, sampling and participant selection, data collection and analysis procedures, and researcher role and biases. Competencies include making an argument about a problem of practice, connecting it to a developed review of the existing literature, sketching out a conceptual framework, and using that framework to develop a methodological approach that will help answer the problem of practice.

Grading Scale

The grading scale for this course is based on a percentage of points earned out of total points offered, and follows the grade scale given below:

A	100-90	C	79-70	F	59 and below
B	89-80	D	69-60		

A grade of a C is considered failing in graduate school. More than two courses with the letter grade of a C or below will result in removal from the EdD in Educational Leadership program.

Missed Assignments/Make-Up Policy

Assignments are due by the start of class on the due date. Late work will be accepted with a credit deduction of 10% for each day each assignment is late. If you are absent the day an assignment is due, please make arrangements to have someone bring it in for you or email it to me by the due date to ensure full credit. Please see me individually if you have special concerns or circumstances.

Confidentiality within the Context of the Course

All of us are aware of the importance to school people and to the successful operation of schools of the use of sensitive information outside of the school. Therefore, I ask that we respect several levels of confidentiality. Information and experiences to which we will be privy can be categorized as follows:

a) information which may be shared in papers, anecdotes, and conversations with me;
b) information, which may be discussed in teams and in class presentations.

Appropriate treatment of the confidentiality of material rests, ultimately, with our good judgment.

College of Education and Human Development Policy on Incomplete Grades in Graduate Classes

A grade of *I* (Incomplete) is assigned if a student has been doing work of acceptable quality but, for reasons satisfactory to the instructor, has not completed all of the work required to earn credit by the end of the semester or session.

The work must be completed and submitted to the instructor by the date agreed to with the instructor, but not later than one year (i.e., 12 months) from the end of the semester or session in which the incomplete was granted.

An *I* remains on the transcript permanently if not resolved or if a written request for an extension is not approved within the allotted time period for removing the incomplete. The request for an exception to regulation, listing the circumstances necessitating the extension, the work that

remains unfinished and a specific deadline for completion, must be approved by the instructor, the student's advisor (for degree students), Graduate Program Coordinator, and Dean. An extension will be granted only under unusual circumstances. For grades of *I*, it is the student's responsibility to reach an understanding with the instructor concerning the completion of work.

Attendance and Participation

The course design is based on the assumption that each person (professor and student) is a teacher as well as a learner and that each of us has a responsibility to contribute to other group members' learning as well as our own. All class members are expected to actively participate both individually and in group-based activities. Class time includes a mix of lectures and group work but it is designed to include a great deal of student work as well. **Class sessions will be held each Thursday evening from 4:00 PM until 8:30 PM for the duration of the semester unless otherwise noted on the class schedule.**

Class member must be well prepared for each class session, having

(a) read the text chapter(s) and readings assigned
(b) completed assignments

Constructive participation in the class members sessions, through written feedback, and other activities is expected. Class members are expected to:

(a) contribute interesting, insightful comments
(b) present examples of concepts relevant to discussion topics
(c) paraphrase and build on comments of others
(d) raise good questions
(e) listen and respond appropriately to others

Positive participation: The student regularly contributes to class discussion and fully participates in activities, with sensitivity to classmates and value of the equal participation of all. Comments add to the learning experience, and are connected to both the readings and the student's relevant outside experiences. Student reads the text and is prepared with notations to contribute.

Negative participation: The student contributes to class discussion infrequently or rarely, and/or does not value and respect the contributions of classmates. Comments do not add to the learning being undertaken by the class as a whole. Does not fully participate or contribute to group activities. Comments are not connected to the readings and isolated to outside experiences only. Student does not read the text, and is not prepared to contribute.

Cooperative activities: Opportunities will be provided for learners to work on cooperative activities with peers that will encompass hands-on, inquiry-based, real life scenarios.

Attendance is required for all classes unless the student contacts the instructor prior to the start of class. Class members who miss more than one excused class will lose participation points. Additionally, class members who miss a class due to an excused absence will have a make-up assignment assigned at the instructor's discretion. The make-up work is due within one week of the missed class.

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- behave in a manner that values each individual
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- actively check UMaine email accounts to stay updated on communication from instructor

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EAD 663
Dissertation Proposal
Fall 2019 Session 2 Overview

Class	Reading for Class	Assignments due at class
Class 1 Thursday, October 22nd, 4:00 – 8:30 Cohort reconnection & course overview Discuss overview of course	Terrell (2016) Chapter 1	Bring previous instruments you have used or reviewed to class
Class 2 Thursday, October 29th, 4:00 – 8:30 Reviewing various instruments	Terrell (2016) Chapter 2	
Class 3 Thursday, November 5th, 4:00 – 8:30 Finalizing the methodological approach	Terrell (2016) Chapter 3	Bring a draft of your Instrument Design to share with you fellow classmates
Class 4 Thursday, November 12th, 4:00 – 8:30		Instrument Design
Class 5 Thursday, November 19th, 4:00 – 8:30 Preparing for your Oral Defense	Terrell (2016) Chapter 4 & 5	Review of what is expected during your Oral Defense (and preparing for the Stand and Deliver)
Class 6 November 30th – December 4th		Oral Defense
Class 7	Terrell (2016) Chapters 6 & 7	Bring a draft of your IRB Submission to share with

Thursday, December 10th, 4:00 – 8:30 Looking to finalize your IRB Submission		your fellow classmates
Class 8 Thursday, December 17th, 4:00 – 8:30 Putting it all together		Working session to get final review from TPG members to help you submit to the IRB

Note: The instructor reserves the right to make changes to the syllabus and course schedule as the class proceeds. If necessary, these changes will be announced in class or via email.

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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

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

GRADUATE PROGRAM/UNIT Educational Leadership

COURSE DESIGNATOR EAD COURSE NUMBER 664 EFFECTIVE SEMESTER Spring 2021

COURSE TITLE Dissertation I

REQUESTED ACTION

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

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

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

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

ELIMINATION:

- [ ] Course Elimination

ENDORSEMENTS

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

Leader, Initiating Department/Unit(s)

Ian M. Mette

Digitally signed by Ian M. Mette
DN: cn=Ian M. Mette, o=University of Maine, ou, email=ian.mette@maine.edu, c=US
Date: 2019.12.17 19:08:26 -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):

Dissertation I (EAD 664) is a three (3) credit hour course that is designed to serve EdD members in their data collection for their dissertation. Cohort members can expect to put in significant additional time and energy over this 15 week course outside of class time. Focus will be given to instrument implementation, targeted return rates, interview saturation, document collection, and additional data collection to help triangulate methodological approaches. Cohort members can expect to begin primary data analysis by the end of this course. Prerequisites: Completion of EAD 663 and Enrollment in EdD in Educational Leadership program or by permission.

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:

Maxwell, J. A. (2012). Qualitative research design: An interactive approach (3rd ed.). Thousand Oaks, CA: Sage. ISBN: 978-1-4129-8119-4

Salkind, N. J. (2013). Statistics for people who (think they) hate statistics (5th ed.). Thousand Oaks, CA: Sage. ISBN: 978-1-4522-7771-4

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

Dr. Ian Mette, Associate Professor in Educational Leadership, 2-2 teaching load

Reason for new course:

We have reestablished our EdD program, a professional degree that focuses on producing scholarly practitioners who are capable of closing the theory-practice gap in educational leadership. To accomplish these goals, we are offering courses to meet the scheduling needs of the EdD program and help to dramatically improve degree completion rates. It will also provide support for EdD students to bridge the theory-practice gap in their own PK-12 contexts.

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

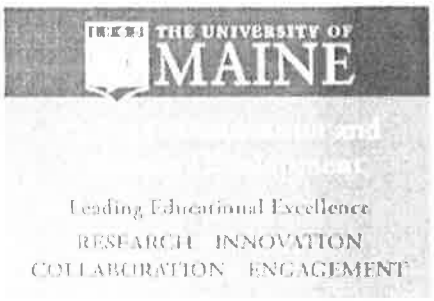
- ◉ No. The department will not request additional resources for this course.
- ○ Yes. Please list additional resources required and note how they will be funded or supported.

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

There are no other departments affected by this course development as there are no course overlaps. While no departments or programs have been affected, departments and programs will be aware of the development of this course through the COEHD Graduate Advisory Council (GAC). Additionally, this course development is required as currently there are no other eight-week EdD courses being taught. Moreover, we see the development of dissertation courses as vital to the effort to dramatically improve our dissertation completion rates.

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 once every two years as part of the EdD cohort program, which supports 12-15 EdD students in each cohort. If other COEHD programs see the need to use this type of course, it could be offered as needed throughout COEHD.



Mission Statement: Drawing on a rich tradition of excellence, the College of Education and Human Development at Maine's flagship university is committed to leading innovation in Maine's Pre-K-12 schools, higher education institutions, and agencies that support academic, cognitive, physical, social and emotional development. We promote effective teaching and learning, identify critical issues, conduct research, and disseminate findings. Collaborating with external partners and experts across the University of Maine, we prepare our graduates to engage in ethical conduct, reflective practice, meaningful inquiry, and data-driven decision making in order to meet the increasingly diverse needs of our state and the world in which we live.

EAD 664: Dissertation I
Spring 2021 Semester (1/21-5/6)
159 Shibles
Thursdays, 4:00 PM – 8:30 PM

Ian M. Mette, PhD
334 Merrill Hall
ian.mette@maine.edu

Cell Phone: (207) 951-5659
Office phone: (207) 581-2733

General Description

The *Dissertation I* course is designed to serve EdD members in their data collection for their dissertation. Cohort members can expect to put in significant additional time and energy over this 15 week course outside of class time. Focus will be given to instrument implementation, targeted return rates, interview saturation, document collection, and additional data collection to help triangulate methodological approaches. Cohort members can expect to begin primary data analysis by the end of this course.

Purpose

This course focuses on the application of data collection practices to solve problems of practice studies that will better inform PK-12 educational leadership. The course is intended to provide the supports needed to address a problem of practice and produce quality data collection practices that will help the education profession throughout the state and the country more broadly. By the end of the course, members will be able to:

1. Collect data using a survey instrument, an interview protocol, or a combination of both.
2. Ensure target return rates of survey data collection or saturation of interview data, or a combination of both.
3. Collect additional information needed to triangulate the selected methodological approach.
4. Begin to calculate Cronbach's alphas for survey constructs or member checking for qualitative interviews.

General Approach to Learning

The 2021 Spring Semester will go by quickly. Different from previous semesters, however, this course will continue to mark the departure from taking classes that teach cohort members new concepts, theories, frameworks, and methodologies, and instead asks EdD members to apply these to their own dissertation to address their problem of practice. As a cohort, you will continue to learn side-by-side with your colleagues from throughout the state, and as such your group experience will depend on your ability to support each other and provide feedback on the rigor of your work. Attendance in the class will continue to be crucial, as is coming prepared having completed all of the work that is being asked of you to keep you on your dissertation timeline. As such, you will progress through this semester – and the final upcoming semesters – by not just building your argument as to why your problem of practice is important, but how you have been able to address this as a scholarly-practitioner and how your work can inform other educators in the state and throughout the nation.

Attendance

Attendance in any class is important, but especially in an eight session course. Class members are allowed one absence per eight session class. ANY ABSENCE beyond the one allowed absence will automatically drop a final grade by one letter grade. More than two absences will result in a C, which is considered failing in graduate school. More than two courses with the letter grade of a C or below will result in removal from the EdD in Educational Leadership program.

Class Expectations

EdD class members should expect to average 10 hours of work outside of class each week to complete assignments, group work, readings, and course requirements.

Required Text:

Maxwell, J. A. (2012). *Qualitative research design: An interactive approach* (3rd ed.). Thousand Oaks, CA: Sage. ISBN: 978-1-4129-8119-4

Salkind, N. J. (2013). Statistics for people who (think they) hate statistics (5th ed.). Thousand Oaks, CA: Sage. ISBN: 978-1-4522-7771-4

Additional Readings:

As assigned throughout the course.

Class Sessions:

Thursday, January 21st, 4:00 PM – 8:30 PM
Thursday, February 4th, 4:00 PM – 8:30 PM
Thursday, February 18th, 4:00 PM – 8:30 PM
Thursday, March 4th, 4:00 PM – 8:30 PM
Thursday, March 18th, 4:00 PM – 8:30 PM
Thursday, April 1st, 4:00 PM – 8:30 PM
Thursday, April 15th, 4:00 PM – 8:30 PM
Thursday, April 29th, 4:00 PM – 8:30 PM

NOTE: Class members should fully expect to stay for the full four and a half hour block. We will take several breaks during these timeslots, but class members should also bring food and beverages to make sure they are alert and engaged during each four hour class.

Assignments

ASSIGNMENT	DUE	POINTS
Finalization of Survey Instrument or Interview Protocol	2/4	20
Ongoing Literature Review	3/18	20
Targeted Return Rates or Interview Saturation	4/1	20
Methodological Validation	4/15	20
Class Attendance and Participation	ongoing	20
	TOTAL	100

Assignment Descriptions:

Finalization of Survey Instrument or Interview Protocol

- EdD members will prepare for the data collection phase of their dissertation work by finalizing their survey instrument (and preparing the launch of the survey in Qualtrics) or their interview protocol (and prepare qualitative interviewing tools and software). As part of this assignment, EdD members will have IRB approval from the previous coursework and show understanding and ability to apply concepts of scholarly research that can be translated into practice.

Ongoing Literature Review

- Based on the work members have read and analyzed in classes and through their own personal readings, cohort members will submit a literature review that encompasses their problem of practice. Candidates will critique and synthesize the literature around their problem of practice, specifically focusing on how this impacts scholarly-practitioners and what this means for educational leaders who intend to close the theory-practice gap. This assignment should result in roughly 2000 – 2500 words (12 point font, Times New Roman) and should serve as the foundation for how you will address your problem of practice. It is critical that EdD members provide additional pages for references (in APA style).

Targeted Return Rates or Interview Saturation

- Throughout the assignment, EdD members will work closely with their advisor to ensure targeted return rates of surveys occur and/or interview saturation is met through a predetermined protocol. During this time, EdD members are expected to ensure quality data is being collected through their survey collection software (e.g. Qualtrics) and that their interviews are being transcribed and being checked for saturation. With the approval of their advisor, EdD members will finalize their targeted data collection prior to initial data analysis.

Methodological Validation

- Based on the semester of work members have conducted up to this point in time, this assignment will help ensure quality data has been collected prior to initial analysis. Cronbach alphas, construct averages, and initial means will be calculated to ensure reliability and validity of surveys. Additionally, those conducting qualitative research will allow participants to member check their transcribed interviews, strike identifying information from the interviews, and triangulate data found through document collection, memos, and observations.

Grading Scale

The grading scale for this course is based on a percentage of points earned out of total points offered, and follows the grade scale given below:

A	100-90	C	79-70	F	59 and below
B	89-80	D	69-60		

A grade of a C is considered failing in graduate school. More than two courses with the letter grade of a C or below will result in removal from the EdD in Educational Leadership program.

Missed Assignments/Make-Up Policy

Assignments are due by the start of class on the due date. Late work will be accepted with a credit deduction of 10% for each day each assignment is late. If you are absent the day an assignment is due, please make arrangements to have someone bring it in for you or email it to me by the due date to ensure full credit. Please see me individually if you have special concerns or circumstances.

Confidentiality within the Context of the Course

All of us are aware of the importance to school people and to the successful operation of schools of the use of sensitive information outside of the school. Therefore, I ask that we respect several levels of confidentiality. Information and experiences to which we will be privy can be categorized as follows:

a) information which may be shared in papers, anecdotes, and conversations with me;
b) information, which may be discussed in teams and in class presentations.

Appropriate treatment of the confidentiality of material rests, ultimately, with our good judgment.

College of Education and Human Development Policy on Incomplete Grades in Graduate Classes

A grade of *I* (Incomplete) is assigned if a student has been doing work of acceptable quality but, for reasons satisfactory to the instructor, has not completed all of the work required to earn credit by the end of the semester or session.

The work must be completed and submitted to the instructor by the date agreed to with the instructor, but not later than one year (i.e., 12 months) from the end of the semester or session in which the incomplete was granted.

An *I* remains on the transcript permanently if not resolved or if a written request for an extension is not approved within the allotted time period for removing the incomplete. The request for an exception to regulation, listing the circumstances necessitating the extension, the work that

remains unfinished and a specific deadline for completion, must be approved by the instructor, the student's advisor (for degree students), Graduate Program Coordinator, and Dean. An extension will be granted only under unusual circumstances. For grades of *I*, it is the student's responsibility to reach an understanding with the instructor concerning the completion of work.

Attendance and Participation

The course design is based on the assumption that each person (professor and student) is a teacher as well as a learner and that each of us has a responsibility to contribute to other group members' learning as well as our own. All class members are expected to actively participate both individually and in group-based activities. Class time includes a mix of lectures and group work but it is designed to include a great deal of student work as well. **Class sessions will be held each Thursday evening from 4:00 PM until 8:30 PM for the duration of the semester unless otherwise noted on the class schedule.**

Class member must be well prepared for each class session, having

(a) read the text chapter(s) and readings assigned
(b) completed assignments

Constructive participation in the class members sessions, through written feedback, and other activities is expected. Class members are expected to:

(a) contribute interesting, insightful comments
(b) present examples of concepts relevant to discussion topics
(c) paraphrase and build on comments of others
(d) raise good questions
(e) listen and respond appropriately to others

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EAD 664
Dissertation I
Spring 2021 Semester Overview

Class	Reading for Class	Assignments due at class
Class 1 Thursday, January 21st, 4:00 – 8:30 Cohort Reconnection & Course Overview Discuss overview of course	Qual: Maxwell (2012) Chapter 1 Quant: Salkind (2013) Chapter 18 & 7	
Class 2 Thursday, February 4th, 4:00 – 8:30 Preparing to Launch Data Collection	Qual: Maxwell (2012) Chapter 3 Quant: Salkind (2013) Chapter 22	Finalization of Survey Instrument or Interview Protocol
Class 3 Thursday, February 18th, 4:00 – 8:30 Data Collection Revisiting Literature Review	Qual: Maxwell (2012) Chapter 4 Quant: Salkind (2013) Chapter 6	
Class 4 Thursday, March 4th, 4:00 – 8:30	Qual: Maxwell (2012) Chapter 5 Quant: Salkind (2013) Chapter 11 & 12	
Class 5 Thursday, March 18th, 4:00 – 8:30 Following Up and Finalizing Data Collection	Qual: Maxwell (2012) Chapter 6 Quant: Salkind (2013) Chapter 13, 14, & 16	Ongoing Literature Review

Class 6 Thursday, April 1st, 4:00 – 8:30 Hitting Your Return Rates or Interview Saturation Preparing to Shift from Data Collection to Data Analysis	Qual: Maxwell (2012) Chapter 7 Quant: Salkind (2013) Chapter 21	Targeted Return Rates or Interview Saturation
Class 7 Thursday, April 15th, 4:00 – 8:30 Validating Your Methodology	Qual: Maxwell (2012) Chapter 2 Quant: Salkind (2013) Chapter 6	Methodological Validation
Class 8 Thursday, April 29th, 4:00 – 8:30		Looking towards Data Analysis

Note: The instructor reserves the **right to make changes to the syllabus and course schedule as the** class proceeds. **If necessary, these changes will be announced in class or via email.**

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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

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

GRADUATE PROGRAM/UNIT Social Work

COURSE DESIGNATOR SWK COURSE NUMBER 585 EFFECTIVE SEMESTER Fall 2020

COURSE TITLE History, Assessment and Interventions in Substance Use and Abuse

REQUESTED ACTION

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

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

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

- [ ] Designator Change
- [ ] Description Change
- [ ] Cross Listing (must be at least 400-level)[1]
- [ ] 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)

Sandra Butler Digitally signed by Sandra Butler Date: 2019.08.29 14:03:51 -04'00'

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

5 NOV 19

College Dean(s)

Graduate School [sign and date]

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

SECTION 1 (FOR NEW COURSE PROPOSALS)

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

SWK 585: Assessment and Intervention in Substance Abuse
MSW student or permission
3 credits-web-based

This course will examine various aspects of substance use and abuse including historical perspectives of addiction and contemporary issues related to prevention, treatment, state and federal healthcare policy. The course will review major classifications of drugs of abuse and the physiological and psychological impact as they relate to assessment, treatment and course of condition. Contemporary theories and practice models will be reviewed and then applied to clinical scenarios with attention to social-cultural, gender, developmental and embodied diversity.

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:

Doweiko, H.E. (2015). Concepts of chemical dependency (10th ed.). Boston: Brooks/Cole

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

Brent Scobie, PhD

Reason for new course:

This course has been taught as a Special Topics (SWK 597) course since 2013, first in-person and now on line. We expect to continue to offer it as a graduate elective each year, so we would like to give it a permanent number.

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.

I don't believe other departments are affected. We have taught a graduate elective on this topic, on and off, since the Graduate Program in Social Work begin in 1988.

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 will be taught each fall. Dr. Scobie is an adjunct instructor who is paid by DLL for this course, as it is taught online. He is part time and has been teaching this course for a number of years.

University of Maine School of Social Work
SWK 585: History, Assessment and Interventions in Substance Use and Abuse

Instructor: Brent Scobie, Ph.D.
Email: Brent.scobie@maine.edu
Office Hours: by appointment (944-6077 or email)

Time/Location: On-Line

Course Description:
This course will examine various aspects of substance use and abuse including historical perspectives of addiction and contemporary issues related to prevention, treatment, state and federal healthcare policy. The course will review major classifications of drugs of abuse and the physiological and psychological impact as they relate to assessment, treatment and course of condition. Contemporary theories and practice models will be reviewed and then applied to clinical scenarios with attention to social-cultural, gender, developmental and embodied diversity.
Credits: 3; Prerequisites: student in MSW program or permission of instructor

Educational Objectives: Upon successful completion of this course, students will be able to:

1. Identify historical trends related to social-cultural understandings and acceptance of individuals with substance abuse problems and how those factors influence current stigmas, treatment approaches and access to treatment.
2. Define the characteristics of substance abuse and dependency by drug classification, age group and within the context of different professional and treatment settings.
3. Understand the differential impact of substance abuse and behavioral addictions on individuals and families and across the continuum of human diversities.
4. Describe and critically evaluate theoretical models and modalities of substance abuse treatment.
5. Demonstrate a general knowledge of the strengths, limitations and impact of contemporary policy and programs in terms of prevention and treatment of substance abuse.

Teaching Methods:
The material in this course will be presented through weekly on-line lectures and accompanying slides relevant to each section of the course, student readings, and clinical case reviews. A typical class will consist of a lecture followed by a clinical case reviews, skill practice sessions and/or critical reviews of student responses to the instructor-guided questions. Additional instructional videos throughout the week may be provided to enhance student learning. Presentation of the course material by the instructor and student assignments will be reciprocally communicated using an asynchronous format. The instructor is responsible for maintaining a rich learning environment for all students, while the learner/student is responsible for maximizing the learning environment and expanding her/his areas of knowledge, skill, and attitude development. Lectures will typically be available on-line by Monday evenings.

Text: Doweiko, Harold E., Concepts of Chemical Dependency, 10th Ed., Brooks/Cole, 2015. Selected readings will be distributed weekly.

Electronic Learning: This on-line course uses UMaine Blackboard platform. Students must have access to a computer, plug-ins required, ability to download programs, e.g., send email, read email, and web access. It is recommended that students also have access to a camera to allow for video conferencing. For those without video capability, audio participation in interactive sessions will be acceptable.

If you need assistance with technical issues, please contact:

UMaineOnline Technical Support Services
umaineonline@maine.edu
Toll Free: 1-877-947-4357
Local: (207) 581-4591
Office Hours: 8AM to 6:00PM, Monday-Thursday; 8AM to 5:00PM, Friday

STUDENT RESPONSIBILITIES

Students are responsible for listening to all class lectures, reviewing the accompanying materials and completing assigned questions and readings prior to each class. Required readings are noted in the Course Schedule section of the syllabus. Occasionally, additional readings will be assigned and will be held on reserve at Fogler Library or distributed through Blackboard. The interactive component of the course is critical to mastery of the material covered. Therefore, it is essential that students be prepared to participate fully in discussions and activities. The Student Academic Services Tutor Program recommends that a minimum of three hours of study per credit hour be used for study time each week. If you are enrolled for fifteen credit hours, that's thirty hours of study time, PLUS class time. For this class, six hours of study time outside of class per week would be the minimum expectation. Students experiencing difficulty with course work should make an appointment with the instructor. Should an emergency arise making it impossible to complete a class lecture or assignment, it is the student's responsibility to notify the instructor prior to class to request information/materials relating to work that will be missed.

INSTRUCTOR RESPONSIBILITIES

The instructor is expected to present the class lecture and material in a timely fashion, to be prepared with current and relevant course content, to review and grade assignments in a timely and fair manner, to communicate concerns about the class to the class as a whole, and to communicate concerns about individual students in private, to respect individual differences among students and the confidentiality of sensitive communication, and to provide the grades for the course.

COURSE OUTLINE

Readings: Students are responsible for all assigned readings. Assignments may change from time to time as new circumstances arise; students are responsible for keeping current on such changes.

Attendance and Participation: Student participation is an integral part of this course. **Participate in each unit of the class and complete all reading assignments from required text. It is expected that each student will watch all class lectures and be prepared to participate in discussions generated through class activities and readings.**

This syllabus and outline are subject to change. In case of an absence, check with classmates to ensure that changes have not been made.

Week 1- **Introductions, overview of course, syllabus, assignments & expectations. The substance abuse provider then and now. Implications for social workers. Practice competencies. Scope of substance use disorders.**

Due: Instructor Guided Questions (IGQS)

Week 2 **Historical and contemporary perspectives on addiction and recovery-social and legal history of substance use. Societal and personal attitudes. Psychopharmacology of Addiction.**

Due: IGQs

READING

- Doweiko Chs. 1, 2, 4, 26, 27
- Cape, G.S. (2003). Addiction, stigma and movies. *ACTA Psychiatrica Scadninavia*, 107, 163-69
- Clark, C. D. (2011). Tough Love: A brief cultural history of addiction intervention. *History of Psychology*. doi: 10.1037/a0025649
- Weiner, B., & White, W. (2006). The Journal of Inebriety (1876-1914): History, topical analysis, and photographic images. Society for the Study of Addictions, 102, 15-23. doi:10.1111/j.1360-0443.2006.01680.x

Week 3 **Psychopharmacology of Addiction continued: Effects of Drugs on Body Function; drugs of abuse by type and prevalence. Implications for assessment.**

Due: IGQs

READING

- Doweiko Chs 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 33
- Kreek, M.J. (2005). Impact of biodirectional translational research on treatment of addiction. *Clinical Neuroscience Research*, 5, 123-39. doi:10.1016/j.cnr.2005.08.008
- Lemonick, M.D. (2011). When your brain can't say no. *Time: Your Brain: A User's Guide*. New York: Time Books, 104-109

Week 4 **Substance Abuse Services for special populations & across the life span.**

Due: IGQs

READING

Doweiko Chs 18, 19, 20, 21, 22

- Wu, L., & Blazer, D.G. (2011). Illicit and nonmedical drug use among older adults: A review. *Journal of Aging and Health*, 23:3, 481-504. Retrieved from http://jah.sagepub.com/content/23/3/481. DOI: 10.1177/0898264310386224
- Arias et al., (2009). Eating disorder symptoms and alcohol use among adolescents in substance abuse treatment. Substance Abuse: Research and Treatment, 3, 81-91.

Week 5 **Psychiatric and medical co-morbidities, adulterants and designer drugs.**

Due: IGQs

READING

- Doweiko Ch. 25, 36 & 37
- Markowitz, J.D., Francis, E.M., & Gonzoles-Nolas, C. (2010). Managing acute and chronic pain in a substance abuse treatment program for the addicted individual early in recovery: A current controversy. Journal of Psychoactive drugs, 42(2), 193-98.

Due: IGQs

Week 6 **Assessment of Substance Use and other Behavioral Addictions**

No IGQs this week.

READING

- Doweiko Ch. 28
- National Survey on Drug use and Health (2004). Alcohol Dependence or Abuse and Age at First Use. Retrieved from http://www.oas.samhsa.gov

- Burck, A.M., Laux, J.M., Harper, H., & Ritchie, M. (2010). Detecting faking good and faking bad with the Substance Abuse Subtle Screening Inventory-3 in a college student sample. *Journal of College Counseling*, 13, 63-72
- AUDIT
- Bliss, D.L., & Pecukonis, E. (2009). Screening and brief intervention practice model for social workers in Non-substance-abuse practice settings. J. of Social Work Practice in the Addictions, 9(1), 21-40.
- DSM V
- Evaluation example and template

Week 7 **Substance Abuse Treatment Part I: Models, Approaches and Outcomes; Readiness to Change.**

Due: 1GQs

READING

Doweiko Chs 29, 30

- De Leon, G. Melnick, G., Cleland, C.M. (2010). Matching to sufficient treatment: Some characteristics of undertreated (mismatched) clients. *Journal of Addictive Disease*, 29, 69-67
- Gori, G.B., (1996). Failings of the Disease Model of addiction. Human Psychopharmacology, 11, 33-38
- Russell, C., Davies, J.B., & Hunter, S.C. Predictors of addiction treatment providers' beliefs in the disease and choice of models of addiction. J. of Substance Abuse Treatment, 40, 150-64.
- Witkiewitz, K., Hartzler, B., & Donovan, D. (2010). Matching motivation enhancement treatment to client motivation: Re-examining the Project MATCH motivation matching hypothesis. Addiction, 105, 1403-1413.
- Zweben, J.E. (1993). Recovery oriented psychotherapy: A model for addiction treatment. Psychotherapy, 30(2), 259-268.

Week 8 **Substance Abuse Treatment Part II: Models continued.**

Due: Special Populations Paper

Doweiko Chs. 31, 32, 34, 35

- Critis-Christoph, P. et al., (2012). A preliminary study of the effects of individual patient-level feedback in outpatient substance abuse treatment programs. *Journal of Substance Abuse Treatment*, 42, 301-09. doi:10.1016/j.jsat.2011.09.003
- Whipple, J.L., & Lambert, M.J. (2011). Outcome measures for practice. *Annu. Rec. Clinical psychol.*, 7, 87-111
- McHugh et al. (2012). Patient preference of psychological vs pharmacologic treatment of psychiatric disorders: A meta analytic review. J. of Clinical Psychiatry, 74(6), 595-602.

Week 9 **Substance Abuse Treatment Part III: Opioid addiction and opioid replacement therapy; relapse prevention and management.**

Due: IGQs

READING

Doweiko Ch. 17

- Einstein, S. (2007). Harm and risk reduction: History, theories, issues and implications. *Substance use and Misuse*, 42, 257-65
- Brocato, J., & Wagner, E.F. (2003). Harm reduction: A social work practice model and social justice agenda. *Health & Social Work*, 28(2), 117-25
- McKay, J.R. et al., (2004). The effectiveness of telephone-based continuing care in the clinical management of alcohol and cocaine use disorders: 12-month outcomes. *Journal of Counseling and Clinical Psychology*, 72(6), 967-79

Week 10 **Substance abuse practice part II: models of therapy; person-centered therapy**

No IGQs this week.

READING

- Reuterlov et al. (2009) What is better: A preliminary investigation of between session change.
- Norcross, J.C., & Lambert, M.J. (2011). Psychotherapy relationships that work II. Psychotherapy, 48(1), 4-8.

Week 11 **Substance abuse practice part I: Motivational Interviewing, Brief Therapy, Cognitive Behavioral Therapy**

No IGQs this week.

READING

- Cully, J.A. & Teten, A.L. (2008). A therapist's guide to brief cognitive behavioral therapy. Dept. of V.A., MIRECC.
- O'Leary Tevyaw, T., & Monti, P.M. (1999). Motivational enhancement and other brief interventions for adolescent substance abuse: Foundations, applications and evaluations. Addiction Suppl., 2, 63-75.
- Velasquez, M.M., & Ingersoll, K. (2011). Motivational Interviewing in groups. Journal of Groups in Addiction and Recovery, 1(1), 27-50.
- Moorey, S. (1996). Cognitive behaviour therapy for whom? Advances in Psychiatric Treatment, 2, 17-23.

Week 12 **Assessment and Interventions with Families**

No IGQs this week.

READING
Doweiko Chs. 23, 24

- Chapters 1, 2 and 6 from Steinglass, P., Bennett, L.A., Wolin, S.J., & Reiss, D. (1987). The Alcoholic Family. New York: Basic Books.

Class 13 **Drug Prevention, Education, Public Policy and Legal Issues**

No IGQs this week.

- Doweiko Cs. 38
- Lee, P.R., Lee, D.R., Lee, P., & Arch, M. (2010). 2010: U.S. drug and alcohol policy, looking back and moving forward. *Journal of Psychoactive Drugs*, 42(2), 99-114.
- Feinstein, E.C., Richter, L., Foster, S.E. (2012). Addressing the critical health problem of adolescent substance use through health care, research and public policy. *Journal of Adolescent Health*, 50(5), 431-36.
- Hammer, D., Phillips, B., & Schmidt, T.L. (2010). The intended-and unintended-consequences of healthcare reform. *Healthcare Financial Management*, 50-55.
- Barry, C.L., & Huskamp, H.A. (2011). Moving beyond parity—Mental health and addiction under the ACA. *New England Journal of Medicine*, 365(11), 973-75

Class 14- Dec 9 **Final Papers Due**

No IGQs this week.

ASSIGNMENTS/GRADING

Evaluation and assessment of performance: 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

Assignments

Class attendance/participation (15%).
Students are expected to listen to assigned lectures and demonstrate meaningful participation in discussion forums.

Instructor guided questions (25%)

Students will be asked to submit their responses to instructor guided questions following each lecture to the discussion forum for the class to review and discuss. Responses to questions are due on the week they are assigned. Two points will be deducted daily for late assignments.

Scholarly Papers

The maximum length for these papers is 10 pages, Arial, 12-point font using one-inch margins. Papers should be emailed to the instructor by the beginning of the class on the day they are due. Late papers will be penalized 10 points for every day they are late.

Paper I: Special Populations (30%)

Based on our class lectures/discussions, assigned readings and personal/professional interests:

1. Identify and describe a special population in terms of its characteristics and what is known about the prevalence and patterns of substance exposure, use and risk factors for addiction.
2. In what ways to the characteristics of the population influence these variables?
3. Are there particular categories of substances which this population is most prone to use? Why?
4. How might the characteristics, values and resources of this group impact substance abuse prevention, assessment and treatment efforts?
5. How might your findings in this area influence your practice style and approach?
6. Support your contentions using relevant sources.

Paper II: Theory and Practice (30%)

This final assignment is an expansion of your first paper.

1. Identify and describe a theoretical paradigm and apply it to substance abuse practice with the special population you described in the first paper.
2. Explain why you chose the theory.
3. What are the major tenets of the theory and what is their degree of fit/lack of fit to the population you discussed in the first paper?
4. Explain how the theory might be operationalized in a substance abuse practice setting with specific attention to the role of the social worker and the client as change agents.
5. Identify the implications of your approach within both assessment/evaluation and treatment phases.
6. What considerations should be taken into account depending on drug type, practice setting, etc.?
7. Support your contentions with relevant research.

All written assignments are expected to be submitted electronically to the instructor by the due date. Late papers will lose points for each day beyond due date, including weekends. All

references should be listed in APA format.

- **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.

- **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 contact me as soon as possible.

- **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, 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.

- **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 at http://www.umaine.edu/osavp/

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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GRADUATE PROGRAM/UNIT COEHD Instructional Technology

COURSE DESIGNATOR EDT COURSE NUMBER 520 EFFECTIVE SEMESTER Spring2020

COURSE TITLE Digital Age Teaching and Learning Methods

REQUESTED ACTION

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

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

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

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

ELIMINATION:

- ☐ Course Elimination

ENDORSEMENTS

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

Leader, Initiating Department/Unit(s)

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 2 (FOR COURSE MODIFICATIONS)

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

EDT520: Digital Age Teaching and Learning Methods
3 Credits
Prerequisites: None
In this foundational course students will explore how digital tools allow for new models of teaching and learning. Students will engage in a critical review of how technology has been used, and explore current trends in educational settings. Students will discuss relevant theories of cognition, explore issues of access and equity, and consider how curriculum, instruction, and assessment might be designed with the support of technology. The learning environment for the course will model different engagement, instructional, and assessment strategies including readings, multiple modes of discussion and reflection, practical applications, design projects, and social networks.

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

In this foundational course students will explore how digital tools allow for new models of teaching and learning in diverse learning environments such as the traditional classroom setting, libraries, coaching models, and industry training. Students will engage in a critical review of how technology has been used, and explore current trends in educational settings. Students will discuss relevant theories of cognition, explore issues of access and equity, and consider how curriculum, instruction, and assessment might be designed with the support of technology. The learning environment for the course will model different engagement, instructional, and assessment strategies including readings, multiple modes of discussion and reflection, practical applications, design projects, and social networks.

Reason for course modification:

This course is part of a proposed new graduate certificate, Library and Media Specialist. In order to count toward the 071 certification, we have specified library and additional educational contexts in the descripton.

SECTION 3 FOR COURSE ELIMINATIONS

Reason for Elimination

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

Course: EDT 520
Course Title: Digital Age Teaching and Learning Methods

Course Description: In this foundational course, students will explore how digital tools allow for new models of teaching and learning in diverse learning environments such as the traditional classroom setting, libraries, coaching models, and industry training. Students will engage in a critical review of how technology has been used, and explore current trends in educational settings. Students will discuss relevant theories of cognition, explore issues of access and equity, and consider how curriculum, instruction, and assessment might be designed with the support of technology. The learning environment for the course will model different engagement, instructional, and assessment strategies including readings, multiple modes of discussion and reflection, practical applications, design projects, and social networks.

Prerequisites: None

Date Approved for 680 Endorsement: Feb 9th, 2016 email from Janet Gallagher to J Prince
Date Approved for 071 Endorsement: August 1st, 2019

Program Vision

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

Course Objectives:

Students will

- Read and synthesize literature and research on educational technology to support personal experiences and deepen conceptual knowledge
- Engage with peers and professional learning network through a variety of modalities to lead and contribute to discussions on educational technology to support deeper reasoning
- Through various modalities engage in reflective practice and goal setting
- Articulate a personal philosophy of educational practice that demonstrates awareness of educational psychology, cognitive principles, conceptual models for technology integration (i.e. TPACK, SAMR) and learning theory
- Demonstrate fluency with new educational tools, and articulate the affordances and constraints of such tools to support educational practice
- Plan for educational experience (of K-12 students or adults learners) that demonstrates the ability to use educational technology, sound educational philosophy, and plan for local context

- List filters for considering new educational tools that demonstrate awareness of ethical, legal, and safety implications of educational technology
- Articulate the difference between andragogy and pedagogy

How does the course explore the central questions? (Draft Rubric)

Depth of Engagement 0=not at all | 1= Introduction | 2=moderate | 3=extensive	
Learning Environments: How do educators leverage technology to create environments that support the development of diverse skills, and emphasize challenging learning experiences?	1
Teaching and Learning: How can technology enhance teaching and learning partnerships that support and promote innovative models of deeper learning?	2
Digital Citizenship: How can educators promote an understanding of the social, ethical and legal issues and responsibilities related to a globally connected society?	1
Professional Practice: How can educators develop and model pedagogical and andragogical principles of learning to promote professional growth and practice in a globally connected society?	2
Leadership: How can educators align vision, implementation, and practice to foster learning enhanced by technology?	1

Computational Thinking

Depth of Engagement 0=not at all | 1= Introduction | 2=moderate | 3=extensive		
Collecting and Creating Data	Textual and Numerical	1
	Images and Graphics	1
	Video	1
	Audio	1
Analysis and Presentation	Written narrative	2
	Web site	2
	Graphs and Charts	1
	Graphics	1
	Video	1
	Audio	1
	Database	0
Collaboration	Content Collaboration	2
	Discussion Collaboration	1

Potential Other Topics

Collecting and Creating Data	Geo-Spatial	0

Analysis and Presentation	Geographic Information Systems	0
	Statistics	0
	Textual analysis Stats Plugin	0

Potential Course Outline

Week	Domain	Essential Question	Topics
1 2 3 & 4	Learning Environments	What is the role of technology in my vision of teaching and learning?	• SAMR - Substitution, Augmentation, Modification and Redefinition • TPACK - Technology, Pedagogy and Content Knowledge • 4Cs - Critical thinking, collaboration, creativity and communication • Medium is the message - affordances and constraints of various media • Critical reading and finding scholarly resources • Critical tool review
5 6 & 7	Professional Practice	How does your knowledge of andragogy and pedagogy enhance your ability to leverage educational technology for teaching and learning?	• Characteristics of adult learners • Differences between adults and children • Designing learning for adults and implications for professional development • Self-directed learning and Drive (Autonomy, Mastery and Purpose)
8 9	Digital Citizenship	What ethical, legal and safety issues must educators attend to when using technology?	• Digital Citizenship framework (9 Elements - Ribble) • ISTE Standards for Students • ISTE Standards for Teachers • What are we afraid of with technology? What can go wrong? • How do we teacher to empower students not control learning?
10	Learning Environments	How does the brain process information, and how does the organization of learning materials shape conceptions of learning and knowing?	• Basics of brain functioning • Working versus long term memory • Myth of multitasking • Thinking fast vs thinking slow (Hattie's review of Kahneman's work on System 1 - fast and automatic; and System 2 - thoughtful and slow)
11 12 13 14	Teaching and Learning	How can educators advocate and use technology to enhance real world, collaborative, learner centered education?	• Overview of Inquiry and open-ended learning • Drive (autonomy, mastery, and purpose) for students • Genius Hours and other formats for opening inquiry • Inquiry with alignment to goals (cognitive, behavioral, and affective) • Designing for engagement • Designing for different learners (adults versus children, range in ability, interest, learning differences) • Leveraging educational technology for learner-centered, real world, and collaborative experiences
15	Learning Environments	What is the role of technology in my vision of teaching and learning?	• Final reflection on course and learning

Potential Course Readings and **Other Materials:**

Week	Domain	Essential Question	Topics
1	Learning Environments	What is the role of technology in my vision of teaching and learning?	• TPACK Explained • Integrating Technology into Instructional Practice Using the Rigor/Relevance Framework as the Primary Tool for Successful Blended Learning • Manning, S., & Johnson, K. E. (2011). The Technology Toolbelt for Teaching (1). Hoboken, US: Jossey-Bass. Retrieved from http://www.ebrary.com.proxy4.ursus.maine.edu • Content Curation Through the SAMR Lens • SAMR Tackk Board • Prezi on TPACK • Top Tools from ISTE 2016 • Edsurge Product Reviews (can filter by cost, tools for classroom, curriculum, communication, and more) • CrunchBase
2 3 & 4			
5 6 & 7	Professional Practice	How does your knowledge of andragogy and pedagogy enhance your ability to leverage educational technology for teaching and learning?	• TEAL Fact Sheet 11: Adult Learning Theories • Aguilar, E. (2016). Supporting adult learners. In The art of coaching teams: Building resilient communities that transform schools (pp. 183–204). San Francisco, CA: Jossey-Bass. • Knowles, M. S. (1980). The modern practice of adult education: From pedagogy to andragogy. Cambridge, London: The Adult Education Company. • Pink, D. H. (2011). Autonomy. In Drive: The surprising truth about what motivates us (pp. 83–107). New York, NY: Riverhead Books. • Pink, D. H. (2011). Type 1 for organizations: Thirteen ways to Improve your company, office, or group. InDrive: The surprising truth about what motivates us (pp. 162–177). New York, NY: Riverhead Books.
8 9	Digital Citizenship	What ethical, legal and safety issues must educators attend to when using technology?	• Kindergarten students in Wake County learn social media skills 8/31/16 • In wake of sexting scandal, Canon City School District forms Digital Citizenship Committee 8/22/16 • Washington's Digital Citizenship Legislation Could Model (3/15/16) • Pasco, FL schools to ask students, parents to sign 'digital citizenship rules 3/11/16 • Ribble, Mike. Digital Citizenship in Schools: Second Edition (graphic left displays the nine elements in this framework) ISTE • Richardson, Will (2008) Footprints in a digital age Educational Leadership 66 (3) ASCD. • Turkle, Sherry Chapter 14 from Alone Together • Pew Report Teacher's Concerns about Digital Media • Atlantic Article The Flight From Conversation: The psychologist Sherry Turkle argues that replacing face-to-face communication with smartphones is diminishing people's capacity for empathy • Atlantic Article All Can Be Lost: The Risk of Putting Our Knowledge in the Hands of Machines: We rely on computers to fly our planes, find our cancers, design our buildings, audit our businesses. That's all well and good. But what happens when the computer fails?

Continued next page

10	Learning Environments	How does the brain process information, and how does the organization of learning materials shape conceptions of learning and knowing?	• Sousa, D. A. (2012). BRAINWORK: The neuroscience behind how we lead others (1 edition). Bloomington, IN: Triple Nickel Press. • Hattie, J., & Yates, G. (2013). Visible learning and the science of how we learn (1 edition). New York, NY: Routledge.
11 12 13 14	Teaching and Learning	How can educators advocate and use technology to enhance real world, collaborative, learner centered education?	• Pahomov, L., & Siegel, D. (2014). Education for the information age. Authentic learning in the digital age: Engaging students through inquiry (pp 1-15). Alexandria, VA: Association for Supervision & Curriculum Development. • Pahomov, L., & Siegel, D. (2014). Constructing inquiry. In Authentic learning in the digital age: engaging students through inquiry (pp. 17–40). Alexandria, VA: Association for Supervision & Curriculum Development. • Bergmann, J., & Sams, A. (2014). Flipped learning: Gateway to student engagement. Eugene, OR: International Society for Technology in Education.
15	Learning Environments	What is the role of technology in my vision of teaching and learning?	• Reflection on course content, no new readings introduced

Potential Activities and Assignments:

Week	Domain	Essential Question	Activities and Assignments
1 2 3&4	Learning Environments	What is the role of technology in my vision of teaching and learning?	• Weekly Engagement (Padlet, Twitter, Videos) • Comparing TPACK, SAMR and 4Cs • Annotated Bibliography • Critical Tool Review • Collaborative Project to show learning on frameworks
5 6&7	Professional Practice	How does your knowledge of andragogy and pedagogy enhance your ability to leverage educational technology for teaching and learning?	• Interactive reading responses (via Blog or Website) • Personal Inquiry project and library research on connection to student outcomes
8 9	Digital Citizenship	What ethical, legal and safety issues must educators attend to when using technology?	• ISTE Students - constituent letter to address how you will help students grow as digital citizens • ISTE Teachers and 9 Elements reflection and goal setting, create a video addressing these elements

10	Learning Environments	How does the brain process information, and how does the organization of learning materials shape conceptions of learning and knowing?	• Create a rubric to evaluate new technology for teaching and learning • Find and evaluate new resources or projects that support inquiry, real-world learning, and collaboration

11
12
13
14
	Teaching and Learning	How can educators advocate and use technology to enhance real world, collaborative, learner centered education?	• Learner inquiry project
			• Applied project
			  ○ redesign/design a unit
			  ○ Design a professional development series

15	Learning Environments	What is the role of technology in my vision of teaching and learning?	• Final reflection

University of Maine Policies

- **Academic Honesty Statement:** Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.
- **Students Accessibility Services Statement:** If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me (the instructor of the course) privately as soon as possible.
- **Course Schedule Disclaimer (Disruption Clause):** In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.
- **Observance of Religious Holidays/Events:** The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.
- Sexual Violence Policy:

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 at http://www.umaine.edu/osavp/

THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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

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

GRADUATE PROGRAM/UNIT COEHD Instructional Technology

COURSE DESIGNATOR EDT COURSE NUMBER 531 EFFECTIVE SEMESTER Spring2020

COURSE TITLE Studio for Computing in 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
- ☐ Number Change
- ☐ Title Change
- ☒ Description Change
- ☒ Prerequisite Change
- ☐ Credit Change
- ☐ Cross Listing (must be at least 400-level)[1]
- ☐ Other (specify) _____

ELIMINATION:

- ☐ Course Elimination

ENDORSEMENTS

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

Leader, Initiating Department/Unit(s)

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 2 (FOR COURSE MODIFICATIONS)

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

Course: EDT 531
Course Title: Studio for Computing in Learning
Credits: 3
Prerequisites: EDT 520 and matriculation in MED in IT
Maker spaces have proliferated in our schools, libraries, and elsewhere in our communities. Similarly, toys and kits for children now include programming, circuits, single-board computers, sensor kits, robotics, drones, and more. This course serves as an introduction to computational thinking and computer science as both a delivery mechanism and a 21st century skill within the context of educational practice. This course will help students develop approaches and strategies for utilizing what have become consumer-level electronic and computational tools in problem- and project-based learning scenarios. Students will learn to help others engage with technology in the learning process as creators. In so doing, they will heighten their awareness of programming and the capacities of computer hardware.

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

Course Title: Studio for Computing in Learning
Credits: 3
Maker spaces have proliferated in our schools, libraries, and elsewhere in our communities. Similarly, toys and kits for children now include programming, circuits, single-board computers, sensor kits, robotics, drones, and more. This course serves as an introduction to computational thinking and computer science as both a delivery mechanism and a 21st century skill within all contexts of educational practice including classrooms, libraries, and additional diverse learning environments. This course will help students develop approaches and strategies for utilizing what have become consumer-level electronic and computational tools in problem- and project-based learning scenarios. Students will learn to help others engage with technology in the learning process as creators. In so doing, they will heighten their awareness of programming and the capacities of computer hardware.
Prerequisites: EDT 520 and matriculation in MED in IT, EdS, or Instructional Technology Graduate Certificate Programs; or instructor permission

Reason for course modification:

This course is part of a proposed new graduate certificate, Library and Media Specialist. In order to count toward the 071 certification, we have specified library and additional educational contexts in the descripton.

SECTION 3 FOR COURSE ELIMINATIONS

Reason for Elimination

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

Course: EDT 531
Course Title: Studio for Computing in Learning
Course Description:
Maker spaces have proliferated in our schools, libraries, and elsewhere in our communities. Similarly, toys and kits for children now include programming, circuits, single-board computers, sensor kits, robotics, drones, and more. This course serves as an introduction to computational thinking and computer science as both a delivery mechanism and a 21st century skill within all contexts of educational practice including classrooms, libraries, and additional diverse learning environments. This course will help students develop approaches and strategies for utilizing what have become consumer-level electronic and computational tools in problem- and project-based learning scenarios. Students will learn to help others engage with technology in the learning process as creators. In so doing, they will heighten their awareness of programming and the capacities of computer hardware.

Prerequisites: EDT 520 and matriculation in MED in IT, EdS, or Instructional Technology Graduate Certificate Programs; or instructor permission

Date Approved for 680 Endorsement: Approved 3/28/17 via email as EDT 598
Date Approved for 071 Endorsement: August 1st, 2019

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

Course Objectives:
Students will be able to

1. Explain how computational thinking relates to current area of teaching practice and discuss implications for design, delivery, and assessment of problem- and project-based learning.
2. Remain current with emerging technology and learning science research in order to create a variety of learning environments. They will
    a. explore consumer-level computer-based resources;
    b. explore fabrication, robotics, electronic, and mobile programing resources
3. Model innovation, iteration, and reflection through personal practice, and engagement with existing research.
4. Demonstrate the ability to use of a variety of mediums and tools to engage and communicate with stakeholders.
5. Proactively engage with a wider community of educators and experts through networked spaces and events.

How does the course explore **the central questions?**

Question	**Depth of Engagement** 0=not at all 1= introduction 2=moderate 3==extensive
Learning Environments: How do educators leverage technology to create environments that support the development of diverse skills, and emphasize challenging learning experiences?	**3**
Teaching and Learning: How can technology enhance teaching and learning partnerships that support and promote innovative models of deeper learning?	**3**
Digital Citizenship: How can educators promote an understanding of the social, ethical and legal issues and responsibilities related to a globally connected society?	**0-3 depending on focus of project**
Professional Practice: How can educators develop and model pedagogical and andragogical principles of learning to promote professional growth and practice in a globally connected society?	**3**
Leadership: How can educators align vision, implementation, and practice to foster learning enhanced by technology?	**2**

Computational Thinking

		Depth of Engagement 0=not at all 1= introduction 2=moderate 3==extensive
Collecting and Creating Data	Textual and Numerical	**0-3 depending on focus**
	Images and Graphics	**0-3 depending on focus**
	Video	**0-2 depending on focus**
	Audio	**0-2 depending on focus**
Analysis and Presentation	Written narrative	**2**
	Web site	**2**
	Graphs and Charts	**1**
	Graphics	**1**
	Video	**1**
	Audio	**1**
	Database	**0-2 depending on focus**
Collaboration	Content Collaboration	**3**
	Discussion Collaboration	**3**

Potential Other Topics

Collecting and Creating Data	Geo-Spatial	**0-2 depending on focus**
Analysis and Presentation	Geographic Information Systems	**0-2 depending on focus**
	Statistics	**0-2 depending on focus**
	Textual analysis Stats Plugin	**0**

Potential Course Outline

Module	Example Topics
Module 1	• Introduction to computational thinking • Makerspaces • Problem-based learning • Project-based learning
Module 2	• Computer Science Basics • Web-based coding for a range of learners
Module 3	• Fabrication • 3D printing • Laser Cutting
Module 4	• Robotics • Drones
Module 5	• Physical Computing • Microcontrollers • Single Board Computers

Potential Course Readings and Other Materials:

Martinez, S. L., & Stager, G. S. (2013). *Invent To learn: Making, tinkering, and engineering in the classroom.* Torrance, CA: Constructing Modern Knowledge Press.

2017 Horizon Report (Select the edition that you feel is most related to your work)
K-12 Edition https://cdn.nmc.org/wp-content/uploads/2017-nmc-cosn-horizon-report-K12-advance.pdf
Higher Education Edition http://cdn.nmc.org/media/2017-nmc-horizon-report-he-EN.pdf
Library Edition http://cdn.nmc.org/media/2017-nmc-horizon-report-library-EN.pdf

Article where the term Computational Thinking was coined (by Jeannette M. Wing, corporate vice president, Microsoft Research)
Computational thinking, 10 years later (by Jeannette M. Wing, corporate vice president, Microsoft Research)

Ratto, M., & Ree, R. (2012). Materializing information: 3D printing and social change. *First Monday, 17*(7). Retrieved from http://firstmonday.org/ojs/index.php/fm/article/view/3968

Kohtal and Hyysalo: "Anticipated environmental sustainability of personal fabrication" in **Journal of Cleaner Production**. 99 (2015) 333e344.

Subhas Chandra Mukhopadhyay Ed: **Internet of Things Challenges and Opportunities**. Springer, New York, 2014.

Sullivan, Umaschi Bers: "Robotics in the early childhood classroom: learning outcomes from an 8-week robotics curriculum in pre-kindergarten through second grade" in **International Journal of Technology Design Education** (2016) 26:3–20.

Dodie J. Niemeyer and Hannah R. Gerber: "Maker culture and Minecraft: implications for the future of learning" in **Educational Media International** Vol. 52 , Iss. 3, 2015.

Kafai, Lee, Searle, et al: "A Crafts-Oriented Approach to Computing in High School: Introducing Computational Concepts, Practices, and Perspectives with Electronic Textiles" in **ACM Transactions on Computing Education**, Vol. 14, No. 1, Article 1, March 2014.

Stager: "3D Printing the Next Dimension" in **Technology & Learning**, Volume 35, Issue 2, 2014.

Potential Activities and Assignments:

- Students will access school or community-based maker/hacker spaces, such as the Maine State Library's Unlimited Possibilities Room (also known as a "Tech Petting Zoo"), Lewiston Library's Maker Space, Brunswick High School Library's "STREAM Lab," the York School Department's school-based MakerSpaces in each of its K-12 school, as well as the hundreds of kits distributed by UMaine's RISE Center which include 3D printers and more. (Students may use their own gear, if they have it and wish to use it.)
- Students will collaborate in a shared blog and publish a forward looking piece on the future of educational technology, these assignments will be supported with scholarly research
- Students will each publish a self-hosted blog or website to share their finding and 'making projects'. During these projects students will speak with experts, visit new spaces, tinker at home, and consider the implication for these tools to impact teaching and learning across educational contexts.
- Students will participate in guest lectures with leaders from the field on specialized topics such as virtual reality, drones, sound production, augmented reality, micro-controllers and single board computers
- Students will participate in a variety of tech-enhances networks to grow their connections and audiences in the field, students will be asked to reflect critically on the experience, and the impact of social media and learning management systems on education

University of Maine Policies

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- **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.
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- **Sexual Violence Policy:**

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.

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THE UNIVERSITY OF MAINE

NEW COURSE PROPOSAL/MODIFICATION/ELIMINATION FORM FOR GRADUATE COURSES

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

GRADUATE PROGRAM/UNIT COEHD Instructional Technology

COURSE DESIGNATOR EDT COURSE NUMBER 561 EFFECTIVE SEMESTER Spring2020

COURSE TITLE Technology Supported Inquiry-Based Teaching and 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
- ☐ Number Change
- ☐ Title Change
- ☒ Description Change
- ☐ Prerequisite Change
- ☐ Credit Change
- ☐ Cross Listing (must be at least 400-level)[1]
- ☐ Other (specify)

ELIMINATION:

- ☐ Course Elimination

ENDORSEMENTS

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

Leader, Initiating Department/Unit(s)

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 2 (FOR COURSE MODIFICATIONS)

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

Course: EDT 561 Technology Supported Inquiry-Based Teaching and Learning
Prerequisites: Graduate Standing or Permission
Credits: 3
This course examines the role of technology in active, inquiry-based teaching and learning environments. Participants will explore self-directed questions and problems engaging in inquiry-based instructional methods supported by technology resources and tools. An integral component of this course will be the development of an inquiry-based facilitation plan that fosters and promotes active student questioning, critical thinking, and complex problem solving for implementation in classroom environments. Emphasis is placed on student-centeredness, constructivist learning theories, and problem based teaching and learning approaches.

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

Course: EDT 561 Technology Supported Inquiry-Based Teaching and Learning
Prerequisites: Graduate Standing or Permission
Credits: 3
This course examines the role of technology in active, inquiry-based teaching and learning in diverse learning environments such as the traditional classroom setting, libraries, coaching models, and industry training. Participants will explore self-directed questions and problems engaging in inquiry-based instructional methods supported by technology resources and tools. An integral component of this course will be the development of an inquiry-based facilitation plan that fosters and promotes active student questioning, critical thinking, and complex problem solving for implementation in classroom environments. Emphasis is placed on student-centeredness, constructivist learning theories, and problem based teaching and learning approaches.

Reason for course modification:

This course is part of a proposed new graduate certificate, Library and Media Specialist. In order to count toward the 071 certification, we have specified library and additional educational contexts in the descripton.

SECTION 3 FOR COURSE ELIMINATIONS

Reason for Elimination

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

Course: EDT 561

Course Title: Technology **Supported Inquiry-Based Teaching and Learning**

Course Description: This course examines the role of technology in active, inquiry-based teaching and learning in diverse learning environments such as the traditional classroom setting, libraries, coaching models, and industry training. Participants will explore self-directed questions and problems engaging in inquiry-based instructional methods supported by technology resources and tools. An integral component of this course will be the development of an inquiry-based facilitation plan that fosters and promotes active student questioning, critical thinking, and complex problem solving for implementation in classroom environments. Emphasis is placed on student-centeredness, constructivist learning theories, and problem based teaching and learning approaches.
Prerequisites: Graduate Standing or Permission
Date Approved for 680 Endorsement: 3/7/2016
Date Approved for 071 Endorsement: August 1st, 2019

Program Vision

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

Course Objectives:

- *Cognitive*: Participants will know different ways technology can be used to support student driven high-quality, standards-based curriculum, instruction, and assessment

- *Affective*: Participants will consider various designs of student-centered and active learning activities that promote intrinsic motivation and student achievement

- *Behavioral*: Participants will be able to facilitate project development that incorporates various technologies as tools to enhance students' research, critical thinking, problem solving, analysis, collaboration, communication, and presentation skills.

How does the course explore the central questions?

Question	**Depth of Engagement** 0=not at all; 1= introduction; 2=moderate; 3=extensive
Learning Environments: How do educators leverage technology to create environments that support the development of diverse skills, and emphasize challenging learning experiences?	**3**
Teaching and Learning: How can technology enhance teaching and learning partnerships that support and promote innovative models of deeper learning?	**3**
Digital Citizenship: How can educators promote an understanding of the social, ethical and legal issues and responsibilities related to a globally connected society?	**2**
Professional Practice: How can educators develop and model pedagogical and andragogical principles of learning to promote professional growth and practice in a globally connected society?	**2**
Leadership: How can educators align vision, implementation, and practice to foster learning enhanced by technology?	**1**

Computational Thinking

		Depth of Engagement 0=not at all; 1= introduction; 2=moderate; 3=extensive
Collecting and Creating Data	Textual and Numerical	**2**
	Images and Graphics	**2**

	Video	**2**
	Audio	**2**
Analysis and Presentation	Written narrative	**2**
	Website	**3**
	Graphs and Charts	**2**
	Graphics	**2**
	Video	**3**
	Audio	**3**
	Database	**1**
Collaboration	Content Collaboration	**3**
	Discussion Collaboration	**3**

Potential Course Outline

Module	Example Topics
1	Developing common language and foundational knowledge • Inquiry, project, and problem based learning
2	Student-centered classrooms Supportive environments Developing questions, concerns, and problems
3	Integrated Curriculum Extracting Themes
4	Curriculum Mapping Theme Development
5	Voting and democracy Self and peer reflection
6	Central and essential questions Research planning
7	Curriculum design Scaffolding content and process

8	Authentic summative and formative assessment

Potential Course Readings and Other Materials:

Texts:
Barell, J. (2007). *Problem-based learning: An inquiry approach* (2nd ed.). Thousand Oaks, CA: Corwin Press.

Beane, J. A. (1997). *Curriculum integration: Designing the core of democratic education.* New York: Teachers College Press.

Boss, S., & Krauss, J. (2014). *Reinventing project based learning: Your field guide to real-world projects in a digital age* (2nd ed.). International Society for Technology in Education.

Additional Resources:
Buck Institute for Education. (2015). Gold standard PBL: Essential project design elements. Retrieved from http://bie.org/blog/gold_standard_pbl_essential_project_design_elements

Crellen Elementary School. (2015, November, 10). "I Wonder" questions: Harnessing the power of inquiry. Retrieved from http://www.edutopia.org/practice/i-wonder-questions-harnessing-power-inquiry

Delzer, K. (2015, October). Reimagining classrooms: Teachers and learners and students as leaders [Video File]. Retrieved from https://www.youtube.com/watch?v=w6vVXmwYvgs&feature=youtu.be

Education Week. (2016). Spotlight on inquiry-based teaching and learning. Retrieved from www.edweek.org.

J. McCarthy. (2015, September, 9). Student centered learning: It starts with the teacher. Retrieved from http://www.edutopia.org/blog/student-centered-learning-starts-with-teacher-john-mccarthy

L. Halman. (2016, March 4). Negotiated curriculum: The questions come from the kids. Retrieved from http://pfpathways.blogspot.com/2016/03/negotiated-curriculum-questions-come.html

M. W. Olofson. (2015, April 18). Sugaring, STEM, and community connections. Retrieved from

http://life.w3.uvm.edu/blog/sugaring-stem-and-community-connections/#.V1XNAZMrKNY

P. Bogdan. (2011, March 29). Student centered learning environments: How and why. Retrieved from http://www.edutopia.org/blog/student-centered-learning-environments-paul-bogdan

Savery, J. R. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem Based Learning, 1*(1). doi:10.7771/1541-5015.1002

Potential Activities and Assignments:

Personal Management and Organization
Students will be asked to consume, curate, create, communicate, and collaborate - the many "C's" of technology integration. Students will develop a digital landing space or platform to manage learning.

Professional Growth
Students will engage in activities that contribute to their professional growth and learning. They will participate in digital local and global communities, developing and expanding personal/professional learning communities

"Teachers and leaders continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources" (www.iste.org).

Resource Consumption, Curation, and Communication
Students will consume weekly readings related to the content and topics of that week. They will develop their own library of resources to be shared and included in their digital space. Students will engage in weekly reflections, and share curated content and reflections with their professional learning communities.

Inquiry-Based Learning Model Weekly Tasks
Students will engage in an inquiry-based negotiated curriculum model in order to develop themes and questions that will drive a curriculum unit or project plan. This process is based off of James Beane's Curriculum Integration model. Throughout this process, students will explore different technologies to support educational environment goals, as well as develop and promote professional growth and practice. Weekly tasks will be related to this model and will vary on time needed based on individual contexts, technological skill levels, and processing.

Technology Explorations

This course focuses on supporting inquiry based learning with technology. Within each module, embedded in the various tasks and activities, students will explore different technologies to consume, curate, create, communicate, think critically, and collaborate.

University of Maine Policies

- **Academic Honesty Statement:** Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.
- **Students Accessibility Services Statement:** If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me (the instructor of the course) privately as soon as possible.
- **Course Schedule Disclaimer (Disruption Clause):** In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.
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- **Sexual Violence Policy:**

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 at http://www.umaine.edu/osavp/

3MT® THREE MINUTE THESIS
FOUNDED BY THE UNIVERSITY OF QUEENSLAND

The University of Maine Graduate School and Foster Center for Student Innovation are again co-sponsoring the
UMaine Three Minute Thesis Competition

Polish your research communication skills and win some prize money!

Don't think you can do it?? "How-to-do a 3MT presentation" coaching will be offered.

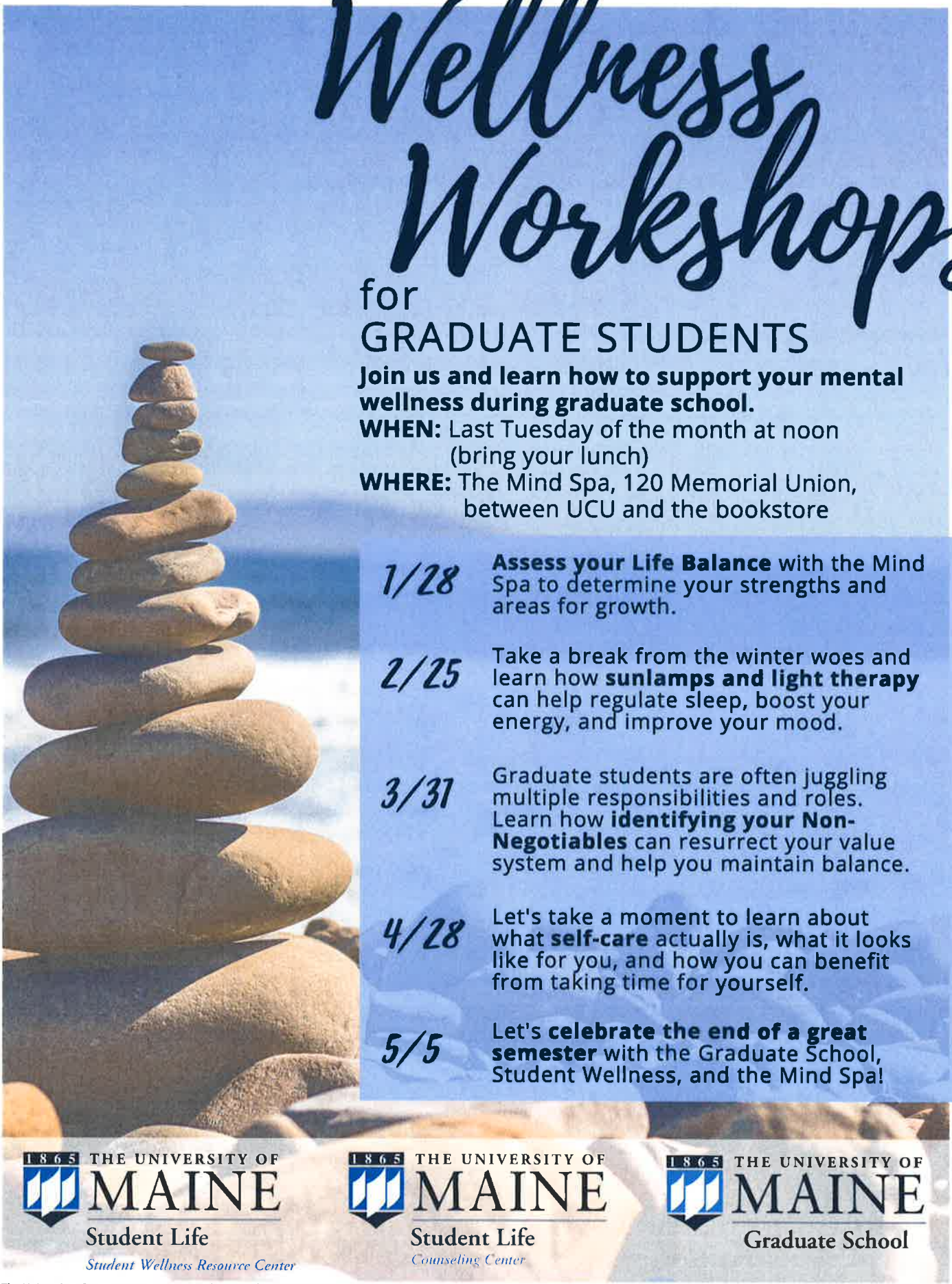
1st Prize	**$500.00**
2nd Prize	**$300.00**
3rd Prize	**$200.00**

- All finalists will be invited to give their presentations at the University of Maine Student Symposium on **April 17, 2020.**
- First prize winner will be the University of Maine's nominee to participate in the northeast regional 3MT competition in Quebec City, CANADA.

Attend an information session in Stodder Hall, Rm 48 on:
January 31 (2:30 pm)
February 4 (10:00 am)
February 6 (12:00 pm), or contact Katie Rossignol (kathryn.rossignol@maine.edu) **by February 10** to sign up!

1865 THE UNIVERSITY OF MAINE Graduate School

1865 THE UNIVERSITY OF MAINE Foster Center for Student Innovation



Wellness Workshops

for GRADUATE STUDENTS

Join us and learn how to support your mental wellness during graduate school.

WHEN: Last Tuesday of the month at noon (bring your lunch)

WHERE: The Mind Spa, 120 Memorial Union, between UCU and the bookstore

1/28	**Assess your Life Balance** with the Mind Spa to determine your strengths and areas for growth.
2/25	Take a break from the winter woes and learn how **sunlamps and light therapy** can help regulate sleep, boost your energy, and improve your mood.
3/31	Graduate students are often juggling multiple responsibilities and roles. Learn how **identifying your Non-Negotiables** can resurrect your value system and help you maintain balance.
4/28	Let's take a moment to learn about what **self-care** actually is, what it looks like for you, and how you can benefit from taking time for yourself.
5/5	Let's **celebrate the end of a great semester** with the Graduate School, Student Wellness, and the Mind Spa!

1865 THE UNIVERSITY OF MAINE
Student Life
Student Wellness Resource Center

1865 THE UNIVERSITY OF MAINE
Student Life
Counseling Center

1865 THE UNIVERSITY OF MAINE
Graduate School

1865 THE UNIVERSITY OF MAINE
Graduate School

THESIS FORMATTING WORKSHOP

GRADUATING SOON? MAKE SURE YOUR THESIS IS FORMATTED CORRECTLY AND IS AS READY TO ROLL AS YOU ARE.

TUESDAY, MARCH 3 | 12-1 PM

STODDER HALL, ROOM 57

RSVP HERE: BIT.LY/3320THESIS

THE UNIVERSITY OF MAINE
Graduate School

GRADUATE STUDENT GOVERNMENT

The University of Maine Graduate School
5775 Stodder Hall, Orono, ME 04469
graduate@maine.edu | T: 207.581.3291
umaine.edu/graduate

Professional Development Series:

MUG CLUB

Open to all Graduate and Undergraduate Students

Diversity and Inclusion

ANILA KARUNAKAR, DIRECTOR OF DIVERSITY AND INCLUSION, WILL PROVIDE A 2-HOUR INTERACTIVE TRAINING COVERING THE BASICS OF THE BIG 8 IDENTITIES IN THE UNITED STATES AND FOUNDATIONAL CONCEPTS OF DIVERSITY AND INCLUSION. STUDENTS, STAFF, FACULTY, AND COMMUNITY MEMBERS ARE WELCOME!

Thursday, February 6, 2020

4 p.m. - 6 p.m.

Career Center Library,

Memorial Union Room #300

PROPOSAL FOR A GRADUATE CERTIFICATE

Graduate Certificate in Computational Thinking

Description

The Graduate Certificate in Computational Thinking is designed to prepare educators to integrate computational thinking skills across content areas, and develop effective pedagogical content knowledge and strategies to apply computational thinking in their environments. Domains include computational thinking; problem-solving, creative, and critical thinking; algorithmic thinking; and programming. Learner outcomes include exploring pedagogical approaches to integrate and promote computational thinking concepts and skills, and understanding the cultural and contextual implications on learning.

Educational Objectives

The objectives of the Certificate in Computational Thinking draw from the International Society of Technology in Education (ISTE) Computational Thinking Competencies. The ISTE standards are pedagogy-focused frameworks for innovation in education through redesigning learning activities with educational technology to engage learners in authentic and active learning. The collection of ISTE standards frame the work across all of the Educational Technology Graduate Programs.

- Educators improve and expand practice through the development of an understanding of the core concepts of computational thinking
- Educators facilitate learning environments in which computational thinking practices are integrated across applicable content areas
- Educators explore appropriate pedagogical strategies to integrate computational thinking using multiple and effective instructional strategies
- Educators promote knowledge of computational thinking through designing, developing, and implementing activities to support learner growth in creative and innovative thinking in problem solving
- Educators understand the impact of equity and access of computational thinking and computing resources and practices in a global society

Courses (12 credits total required)

Required (6 credits)

Course Number/Title	Modality	Current Instructor	Frequency
EDT 571 Methods of Integrating Inclusive Computational Thinking	100% online	Jeff Bailey *(Program Faculty; Technology Integration and Computer Science Educator RSU10)*	1 x per AY
EDT 572 Programming in Multiple Paradigms	100% online	Christopher Bennett *(Program Faculty; Assistant Professor of Computer Science UMF)*	1 x per AY

Electives (6 credits from the following)

Course Number/Title	Modality	Current Instructor	Frequency
EDT 520 Digital Age Teaching and Learning Methods*	100% online	Mia Morrison *(UMaine Lecturer of Instructional Technology and MEd in IT Program Advisor)*	2 x per AY
EDT 531 Studio in Computing	100% online	Andrew Wallace *(Program Faculty; Director of Technology South Portland Maine Schools)*	2 x per AY
EDT 598 Special Topics in Educational Technology*	100% online	Varies	Varies
EDT 573 Introduction to Web Development and Mobile Application	100% online	In Development	

Development for Educators			
EDT 574 Computational Thinking in Early Childhood and Elementary Contexts	100% online	In Development	
EDT 575 Computational Thinking in Middle Level and Secondary Contexts	100% online	In Development	
Students may request to enroll in up to six graduate level credits from the Spatial Information Science and Engineering program (SIE courses at the 500-level or above). Permission is required by the Instructional Technology Program Advisor			

**With permission from the Program Advisor or Program Coordinator*

Alignment Between Educational Objectives and Course Requirements

The primary objective of this certificate is to prepare educators and related persons in Pk-12 educational environments to integrate and apply computational thinking education skills. To achieve this, graduates earning this certificate will have an understanding of

(1) the foundational content knowledge of computational thinking
(2) effective pedagogical knowledge and strategies in integrating and teaching computational thinking to learners inclusive of Pk-12 students, and other educators
(3) cultural and contextual implications on student learning, including but not limited to, groups who are historically underrepresented in the field

The electives in this certificate will support the outlined objectives and participants professional goals.

Core Courses

The first core course will increase the awareness of computational thinking, and its key components, among participants and encourage them to integrate computational thinking in their domains. The second core course will build on those outcomes and dive deeper into computational thinking as a problem-solving process through the exploration of different programming languages and transferring this problem solving process to a wide variety of problems across content areas and educational domains.

EDT 571: Methods of Integrating Inclusive Computational Thinking

Computational thinking is a problem-solving process that draws on the principles and practices central to computing education. This course provides a foundation in the big ideas in computational thinking - abstraction, data and information, algorithms, and programming - and the application of these practices to domain-based contexts in educational environments. Participants will explore pedagogical approaches to promoting computational thinking with a focus on including those groups who are historically underrepresented in the field. Students will use a range of curriculum standards to plan, design instruction, and use assessment strategies that integrate computational thinking competencies.
As a result of this course, students will be able to

1. Develop an understanding of computational thinking and its integration and application as a cross-curricular skill
2. Apply computational thinking to educational contexts and classrooms
3. Understand who has been underrepresented in the field of computing and understand learners' needs to support an inclusive computational thinking culture
4. Apply teaching strategies for integrating computational thinking practices into learning activities in ways that enhance student learning of both the academic discipline and computing concepts
5. Develop a foundational knowledge of computer algorithms to help teach content area skills in applicable environments

EDT 572: Teaching Programming in Multiple Paradigms

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

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

Statement of Need and Intended Audience

There are many compelling reasons for the Educational Technology Graduate Programs Collaborative (UMaine, UMF, USM) to offer this certificate. Stakeholder feedback from professionals in higher education, Pk-12 education, and industry experts express an immediate need in the state and beyond for the inclusion of computational thinking and its application as a

cross-curricular skill for practicing educators. While there are online options for content knowledge development in specific computer science applications, this certificate will fill a gap for pedagogical considerations and applications in educational environments. It is necessary to improve access for participants across professions to explore and develop knowledge to integrate computational thinking principles in educational contexts. Therefore, the intended audience for this certificate includes:

- Pk-12 educators looking to integrate or incorporate computational thinking in their practice
- Those in educational contexts looking to collaborate with other educators to create learning activities that cross disciplines to strengthen student understanding of computational thinking (for example, content or curriculum coaches)
- Educational technology integrators and leaders, and curriculum coordinators across content areas

The program faculty envision the Certificate as both a stand-alone option for students who want to focus solely on the integration of computational thinking in their respective contexts, or as part of the coursework toward a Master's in Instructional Technology degree or an Educational Specialist degree.

Staffing and Resources

As proposed, no new faculty lines would be required to offer this certificate program. Current faculty and adjuncts will teach courses. Coordination and advising of this certificate will be done by the MEd in IT program coordinator and advisor.

Eligibility and Admission Criteria for the Certificate Program

To apply, prospective students would need to complete the Certificate Application to the UMaine Graduate School for department and graduate school review and decision.

- Students must hold a bachelor's degree from an accredited college or university. Official transcript(s) required.
- All courses must be passed with a grade of B- or above to be applied towards the certificate.
- Courses taken for this certificate program may be accepted for transfer into a graduate degree program if approved by the student's program advisor. Completion of a certificate course does not guarantee acceptance towards a graduate degree.

Course: EDT 571
Course Title: Methods of Integrating Inclusive Computational Thinking
Course Description:
Computational thinking is a problem-solving process that draws on the principles and practices central to computing education. This course provides a foundation in the big ideas in computational thinking - abstraction, data and information, algorithms, and programming - and the application of these practices to domain-based contexts in educational environments. Participants will explore pedagogical approaches to promoting computational thinking with a focus on including those groups who are historically underrepresented in the field. Students will use a range of curriculum standards to plan, design instruction, and use assessment strategies that integrate computational thinking competencies.

Prerequisites: None

Date Approved for 680 Endorsement: April 11, 2019 *(also approved for 680 methods course)*

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

Course Objectives:

1. Develop an understanding of computational thinking and its integration and application as a cross-curricular skill
2. Apply computational thinking to educational contexts and classrooms
3. Understand who has been underrepresented in the field of computing and understand learners' needs to support an inclusive computational thinking culture
4. Apply teaching strategies for integrating computational thinking practices into learning activities in ways that enhance student learning of both the academic discipline and computing concepts
5. Develop a foundational knowledge of computer algorithms to help teach content area skills in applicable environments

How does the course explore the central questions?

Question	**Depth of Engagement** 0=not at all 1= introduction 2=moderate 3==extensive
Learning Environments: How do educators leverage technology to create environments that support the development of diverse skills, and emphasize challenging learning experiences? Participants will learn some different coding curricula and environments (Code.org hour of code, Code Academy, CS First, and Scratch, Blockly Games, Made with Code, Lightbot) as well as some techniques/processes used in coding (paired programming, top down design and scrum) After those experiences, participants will record or write reflections on what skills they used in completing those tasks and reflect on the level of challenge it	**3**

presented them. Similarly, they will write a sample lesson or activity to incorporate challenge and diverse skills in their own teaching environments.	
Teaching and Learning: How can technology enhance teaching and learning partnerships that support and promote innovative models of deeper learning? Diving into data allows us to use data from real-world sources in the classroom. Looking at real data can help students draw connections between content areas and concepts. Additionally, participants will collaborate with each other in the development of code.	**1-2 Depending on focus**
Digital Citizenship: How can educators promote an understanding of the social, ethical and legal issues and responsibilities related to a globally connected society? Participants will review the core tenants of digital citizenship and create a lesson targeting the needs of their group of learners in order for students to function safely and appropriately in a global society.	**2**
Professional Practice: How can educators develop and model pedagogical and andragogical principles of learning to promote professional growth and practice in a globally connected society? Participants in the course will learn how to run inquiry-based models for developing algorithms and programs. They will review and evaluate different online coding curricula to determine it's level or engagement, depth, and accessibility for their student groups.	**1**
Leadership: How can educators align vision, implementation, and practice to foster learning enhanced by technology? Participants will participate in a professional learning network online to engage in discussion with others. They will also submit a plan to create an inclusive CS classroom that reflects their vision.	**2**

Computational Thinking

		Depth of Engagement 0=not at all 1= introduction 2=moderate 3==extensive
Collecting and Creating Data	Textual and Numerical	**3**
	Images and Graphics	**1**
	Video	**0**
	Audio	**0**
Analysis and Presentation	Written narrative	**3**
	Website	**1**
	Graphs and Charts	**3**
	Graphics	**0**
	Video	**0**

	Audio	**0**
	Database	**0**
Collaboration	Content Collaboration	**2**
	Discussion Collaboration	**3**

Potential Other Topics

Collecting and Creating Data	Geo-Spatial	**0**
Analysis and Presentation	Geographic Information Systems	**0**
	Statistics	**2**
	Textual analysis Stats Plugin	**1**

Course Outline

Module	**Guiding Questions**	**Activities and Assessments**
Inclusive and Equitable Computational Thinking and Computing	What is our understanding of computational thinking? Who is being left out of the computing culture and why? What are the impacts of computational thinking on our present and our future? How do we create an inclusive computational thinking and computing environment?	Read, Reflect, Respond **PROJECT** **Create an inclusive CT recruitment tool/classroom plan** How does this reflect the readings and research into inclusive computational thinking and computing practices? Video/Poster/Pamphlet **PAPER** **Resource Review:** Coding curricula and websites, Which seem appropriate for your students? Why?
Understanding Data	How do computers understand data (text, numbers, images)? How can data be collected and represented? How can we analyze and use large datasets? What are the teaching and learning implications for our students?	Read, Reflect, Respond **PROJECT** **Data Project:** Create a survey or form to collect different types of data. Represent that data in visual form. Analyze the data and write a narrative explaining the conclusions and limitations of the data. **PROJECT**

		Data Abstraction Project- Create Pixel Image: Black and White. **PROJECT** **Public Data Sources Analysis**: Use a public data set to analyze a trend or draw a conclusion.
Algorithms and Abstractions	How do computers use iteration, selection, and sequences to perform tasks? How can we create abstractions to make computer algorithms more useful and efficient? How can we use a variety of instructional approaches to help learners frame problems that can be represented as computational steps or algorithms?	Read, Reflect, Respond **LESSON** **Human Algorithm:** Describe a process in human language and begin to translate it into computer friendly language. **PROJECT** **Turtle Drawings:** Create simple line drawings with some algorithms you create. Look for patterns in the code to create more efficient functions.
Introduction to Programming	What tools and programming languages allow students to learn coding skills easily? How might this support problem-solving and learning? How do we create functions, variables, and use logic to write program code that achieves our intended goal?	Read, Reflect, Respond **PROJECT** **Basic App Design:** Create an app that includes user input, and logic to perform a task.
Instructional Approaches to Integrating Computational Thinking	What Digital Citizenship practices are needed to participate in a Global Society safely and effectively? What teaching structures create an inquiry-based and collaborative computational thinking experience for students?	Read, Reflect, Respond **LESSON** **Digital Citizenship Lesson:** Create a classroom lesson that teaches one of the important practices of Digital Citizenship as it is relevant for the students you work with. **PAPER** **Investigate and Report:** Research one of the following

		pedagogical approaches to integrating computational thinking and computing practices and post in the discussion board: Paired-Programming, Top-Down Design, Scrum.

Grading :

35% Projects (averaged together equally weighted)
25% Lesson Plans (averaged together equally weighted)
25% Papers (averaged together equally weighted)
15% Read, Reflect Respond Posts (RRRs) (Weekly posts and responses averaged together equally weighted)

All assignment details, descriptions, and rubrics are posted in Google Classroom.

All work may be revised for full credit after discussing the work with me via phone, email or video.

A = 93 – 100 (4.00 GPA)
A- = 90 – 92 (3.67 GPA)
B+ = 87 – 89 (3.33 GPA)
B = 83 – 86 (3.00 GPA)
B- = 80 – 82 (2.67 GPA)
C+ = 77 – 79 (2.33 GPA)
C = 73 – 76 (2.00 GPA)
C- = 70 – 72 (1.67 GPA)
W No GPA computation
Grades less than C are not acceptable for graduate work.

Participation:
Successful experiences in an online course are dependant on building a positive class culture and frequent participation. Participants will be expected to respond to class topics in text and video formats using a combination of Google Classroom and FlipGrid. We will have a few scheduled synchronous live video chats using Zoom as well.

Rubrics:
Rubrics for each of the assessments given in the course will be provided prior to the activity. If participants have questions about grading criteria for an assessment, they should notify me prior to the due date by email, phone or online discussion board.

Required Technology: The nature of a Computer Science course requires participants to be able to access many online resources for research, programming and class discussion. A laptop capable of running a browser like Google Chrome or Firefox is recommended. Participants should have the ability to add programs to the device. Required programs/apps are Flipgrid and Zoom which allows for a video discussion. A device that allows you to take short videos and photos (with a webcam or cell phone) is required for some projects and discussions. For online video discussions, a headset or pair of headphones with a functioning microphone and webcam is required. Participants will need a Maine.edu email address to connect with many of the online discussions.

Required Texts: These two texts will highlight underserved populations in Computer Science and are important understandings to providing inclusive educational experiences. Papers and online responses will be required from these texts.

Stuck in the Shallow End. Education, Race and Computing by Jane Margolis (ebook link)

Unlocking the Clubhouse Women in Computer Science, by Jane Margolis and Allan Fisher

Potential Course Readings and Other Materials:

In the course, we will access many websites, videos, and online readings and activities. Those specific resources will be shared in the class activities to which they are connected.

Master, A., Cheryan, S., & Meltzoff, A. N. (2016). Computing whether she belongs: Stereotypes undermine girls' interest and sense of belonging in computer science.
http://life-slc.org/docs/MasterCheryanMeltzoff_2015_JEP.pdf

https://pdfs.semanticscholar.org/2358/78ce80b9d82abdad700f4ddd6c17d5292a1f.pdf

Girls Who Code Policy Brief
https://www.accenture.com/t20161018T094638__w__/us-en/_acnmedia/Accenture/next-gen-3/girls-who-code/Accenture-Cracking-The-Gender-Code-Report.pdf

Code.org Statistics on Computer Science Education https://code.org/promote

University of Maine Policies
Most up to date information can be found here:
https://umaine.edu/citl/teaching-resources-2/required-syllabus-information/

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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.

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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 at http://www.umaine.edu/osavp/

- **Classroom Civility**

The University recognizes that many members of its community use names other than their legal names. For some students and employees, a chosen or preferred name may be an important component of their identity. Therefore, the University has established this policy which allows students and employees to indicate their preferred names to the University community even if they have not changed their legal names. These may include individuals who prefer to use:

- a middle name or nickname instead of a first name;
- an anglicized name;
- a name to which the individual is in the process of legally changing; or
- a name that better represents the individual's gender identity.

College of Education and Human Development

Graduate Certificate Proposal Routing Slip

Date: October 16, 2019

From: School of Learning and Teaching
College of Education of Education &
Human Development

Item: Graduate Certificate Proposal

Title of Certificate: Graduate Certificate in Library and Media Specialist

Required Courses:

EDT 513: Dynamic PK-12 Library Management
EDT 516: Reference and Research for Digital Age Teaching, Learning and Libraries
EDT 520: Digital Age Teaching and Learning Methods
EDT 531: Studio for Computing in Learning
EDT 561: Technology Supported Inquiry-Based Teaching and Learning

* *

Please forward to the next person or department on the list below.

1. Meredith Swallow, Program Coordinator
2. Shihfen Tu, School Director
3. Sandra Caron, College Curriculum Committee Chair
4. Jim Artesani, Associate Dean of Graduate Education, Research, & Outreach
5. Mary Gresham, Interim Dean
6. Grad Board

PROPOSAL FOR A GRADUATE CERTIFICATE

Graduate Certificate in Library and Media Specialist

Introduction

The Certificate in Library and Media Specialist prepares educational teachers, leaders, and resource specialists to facilitate and advocate for equitable access of digital and print resources and information for all students. Aligning to the current standards for school librarianship by the American Library Association and the American Association for School Librarians, this certificate will support the development of essential competencies toward managing library and information services in a Pk-12 environment. Credits earned in this program may be applied toward the Maine 071 Library/Media Specialist Certificate.

Educational Objectives

The objectives for the Certificate in Library and Media Specialist draw from the framework as outlined in the ALA/AASL Standards for Initial Preparation of School Librarians.

The Learner and Learning

- Participants will become effective educators with knowledge of learners and learning in the digital age including instruction, assessment, and curriculum development

Planning for Instruction

- Participants will demonstrate efficient and ethical information-seeking behavior in print and digital environments and be able to teach this behavior to students

Knowledge and Application of Content

- Participants will apply theories of Library Information Science to the School Library context including the realms of teaching, management, and leadership

Organization and Access

- Strategically plan, facilitate and advocate for flexible, open access to library resources and services according to the ethical codes of the profession

Leadership, Advocacy, and Professional Responsibility

- Be ethical, forward-thinking leaders in the field of education generally and in school libraries specifically

Required Courses (15 credits)

Course Number/ Title	Modality	Current Instructors	Frequency of Offering
EDT 515: Dynamic PK-12 Library Management	100% Online	Megan Blakemore	1x/AY Year
EDT 516: Reference and Research for Digital Age Teaching, Learning and Libraries	100% Online	Megan Blakemore	1x/AY Year

EDT 520: Digital Age Teaching and Learning Methods	100% Online	Mia Morrison	2-3x/AY Year
EDT 531: Studio for Computing in Learning	100% Online	Andy Wallace	2x/AY Year
EDT 561: Technology Supported Inquiry-Based Teaching and Learning	100% Online	Mia Morrison	1x/AY Year

Alignment Between Educational Objectives and Course Sequence

Standard Category	Objective	Course Alignment (primary objectives)
The Learner and Learning	Become effective educators with knowledge of learners and learning in the digital age including instruction, assessment, and curriculum development	EDT 515, 516, 520, 531, 561
Planning for Instruction	Demonstrate efficient and ethical information-seeking behavior in print and digital environments and be able to teach this behavior to students	EDT 515, 516, 520, 531, 561
Knowledge and Application of Content	Apply theories of Library Information Science to the School Library context including the realms of teaching, management, and leadership	EDT 515, 516, 561
Organization and Access	Strategically plan, facilitate and advocate for flexible, open access to library resources and services according to the ethical codes of the profession	EDT 515, 516, 520

Leadership, Advocacy, and Professional Responsibility	Be ethical, forward-thinking leaders in the field of education generally and in school libraries specifically	EDT 515, 520

Course Descriptions and Objectives

EDT 515 Dynamic PK-12 Library Management
The course covers principles and processes underlying the successful administration of a school library including management, program development, and evaluation of contemporary school libraries. The course explores the changing roles and responsibilities of an effective and proactive school librarian. This course will explore the role of educational technology in the effective management of the PK-12 library.
Course Objectives
Students will:

- Work collaboratively with others in the field to explore policy, design, and best practices in school library management across the grade ranges.
- Visit and evaluate a school library with the American Association of School Librarians (AASL) standards
- Understand the history, philosophy, principles and ethics of library and information science.
- Apply the principles and theories of Library and Information Science (LIS) to the school library context including
    - Key issues emerging in school librarianship ranging from information access to roles in school reform and student achievement
    - Information curation and organization.
    - Theories and processes involved in managing personnel, resources, facilities, and finances.
    - Design of space and programs in the school library.
    - Planning and evaluation of the school library program.
- Use a range of educational technologies to connect with both local and global networks of librarians
- Explore a range of digital tools for curation in the school library

EDT 516 Reference and Research for Digital Age Teaching, Learning and Libraries
The modern library is a rich hub of information sources, and librarians need excellent skills to promote inquiry, inclusiveness, and collaboration with students and educators. This course will provide an overview of the field of reference and research instruction in order to prepare graduate students to work with students in grades PK-12. Graduate students will critically evaluate the most important print and electronic resources, and understand the vital role of digital curation. Graduate students will be trained in the art and science of the reference interview, bibliographic instruction, and readers' advisory. In addition, students will practice their leadership skills with reference and research as they seek to promote the library as a learning commons, and information literacy as essential to teaching and learning in the digital age.
Course Objectives
Students will:

1. Explore essential models of information behavior.

a. Understanding information behavior is essential to providing instruction in research and information literacy. Students will understand the connection between information behavior and instruction.

2. Define reference services and research skills and their role in the PK-12 environment: Understand and use evaluation criteria and selection tools that are appropriate to develop, curate, organize, and manage a collection designed to meet the diverse curricular and personal needs of the learning community.
    a. Learn to develop learning activities for students to recognize and evaluate information on the basis of accuracy, bias, validity, and cultural context and can use that information ethically.
    b. Understand the different research skills needed as students progress from pre-kindergarten through grade 12.
3. Be able to provide reference services to students in grades PK-12:
    a. Use digital tools to locate, access, and/or communicate information in an ethical manner with an emphasis on the skills of database and online searching
    b. Gain familiarity with the most important print and electronic resources for PK-12 students with an understanding of which tools are appropriate for which age range.
    c. Recall and perform the steps of a reference interview and readers advisory.

EDT 520 Digital Age Teaching and Learning Methods

In this foundational course, students will explore how digital tools allow for new models of teaching and learning in diverse learning environments such as the traditional classroom setting, libraries, coaching models, and industry training. Students will engage in a critical review of how technology has been used, and explore current trends in educational settings. Students will discuss relevant theories of cognition, explore issues of access and equity, and consider how curriculum, instruction, and assessment might be designed with the support of technology. The learning environment for the course will model different engagement, instructional, and assessment strategies including readings, multiple modes of discussion and reflection, practical applications, design projects, and social networks.

Course Objectives

Students will

- Read and synthesize literature and research on educational technology to support personal experiences and deepen conceptual knowledge
- Engage with peers and professional learning network through a variety of modalities to lead and contribute to discussions on educational technology to support deeper reasoning
- Through various modalities engage in reflective practice and goal setting
- Articulate a personal philosophy of educational practice that demonstrates awareness of educational psychology, cognitive principles, conceptual models for technology integration (i.e. TPACK, SAMR) and learning theory
- Demonstrate fluency with new educational tools, and articulate the affordances and constraints of such tools to support educational practice
- Plan for educational experience (of K-12 students or adults learners) that demonstrates the ability to use educational technology, sound educational philosophy, and plan for local context

- List filters for considering new educational tools that demonstrate awareness of ethical, legal, and safety implications of educational technology
- Articulate the difference between andragogy and pedagogy

EDT 531 Studio for Computing In Learning
Maker spaces have proliferated in our schools, libraries, and elsewhere in our communities. Similarly, toys and kits for children now include programming, circuits, single-board computers, sensor kits, robotics, drones, and more. This course serves as an introduction to computational thinking and computer science as both a delivery mechanism and a 21st century skill within all contexts of educational practice including classrooms, libraries, and additional diverse learning environments. This course will help students develop approaches and strategies for utilizing what have become consumer-level electronic and computational tools in problem- and project-based learning scenarios. Students will learn to help others engage with technology in the learning process as creators. In so doing, they will heighten their awareness of programming and the capacities of computer hardware.
Course Objectives
Students will be able to

1. Explain how computational thinking relates to current area of teaching practice and discuss implications for design, delivery, and assessment of problem- and project-based learning.
2. Remain current with emerging technology and learning science research in order to create a variety of learning environments. They will
    a. explore consumer-level computer-based resources;
    b. explore fabrication, robotics, electronic, and mobile programing resources
3. Model innovation, iteration, and reflection through personal practice, and engagement with existing research.
4. Demonstrate the ability to use a variety of mediums and tools to engage and communicate with stakeholders.
5. Proactively engage with a wider community of educators and experts through networked spaces and events.

EDT 561 Technology Supported Inquiry-Based Teaching and Learning
This course examines the role of technology in active, inquiry-based teaching and learning in diverse learning environments such as the traditional classroom setting, libraries, coaching models, and industry training. Participants will explore self-directed questions and problems engaging in inquiry-based instructional methods supported by technology resources and tools. An integral component of this course will be the development of an inquiry-based facilitation plan that fosters and promotes active student questioning, critical thinking, and complex problem solving for implementation in classroom environments. Emphasis is placed on student-centeredness, constructivist learning theories, and problem based teaching and learning approaches.
Course Objectives

- *Cognitive*: Participants will know different ways technology can be used to support student driven high-quality, standards-based curriculum, instruction, and assessment
- *Affective*: Participants will consider various designs of student-centered and active learning activities that promote intrinsic motivation and student achievement

- *Behavioral*: Participants will be able to facilitate project development that incorporates various technologies as tools to enhance students' research, critical thinking, problem solving, analysis, collaboration, communication, and presentation skills.

Statement of Need

The Maine Department of Education continuously identifies certified school librarians as a teacher shortage area. Additionally, an early investigation by the Maine Association of School Libraries found that many schools, particularly those in the northern part of the state and/or at the elementary level, do not have a certified school librarian. This graduate certificate will address those shortage needs across the state by providing courses in which participants will be able to earn 15-credits that can be applied toward the Maine 071 Library/Media Specialist Certification.

Intended Audience

- Current classroom teachers who would like to add a school library endorsement.
- Current paraprofessionals working in school libraries who would like to become certified school librarians.
- New educators interested in a career in school libraries.

Impact on Existing Programs

This certificate is anticipated to have a positive impact on existing Master's and EdS programs in the College of Education and Human Development. The Program Faculty envision the Certificate as both a stand-alone option for students who want to focus solely on working toward the 071 Library/Media Specialist Certificate in Maine, as part of an elective sequence in the Master's in Instructional Technology degree, or as part of initial course work toward a Library/Media Certification.

Staffing and Resources

- This certificate program will not result in additional expenses for the College of Education and Human Development.
- As proposed, no new faculty lines would be required to offer this certificate program. All courses currently exists and current faculty and adjuncts would teach the courses.
- Coordination and advising of this certificate would be done by the MEd in IT program coordinator and advisor

Admissions Procedures

To apply, prospective students would need to complete the Certificate Application to the UMaine Graduate School for department and graduate school review and decision.

- Students must hold a bachelor's degree from an accredited college or university. Official transcript(s) required.
- All courses must be passed with a grade of B- or above to be applied towards the certificate.

- Courses taken for this certificate program may be accepted for transfer into a graduate degree program if approved by the student's program advisor. Completion of a certificate course does not guarantee acceptance towards a graduate degree.

THE UNIVERSITY OF MAINE
Graduate School of Business

Memo

To: Dr. Kody Varahramyan, V.P. for Research and Dean of the Graduate School

From: Dr. Michael Weber, Dean of the Graduate School of Business

Date: November 20, 2019

Subject: Graduate Certificate in Business Analytics

The attached proposal provides details for a Graduate Certificate in Business Analytics. The specific elements of the proposal include the following:

- Academic Program Alignment
- Admissions Requirements
- Completion Requirements
- Program Description
- Program Requirements
- Course Descriptions

This program was previously offered by the University of Southern Maine, and we are now moving the program to the University of Maine Graduate School of Business, as it is required that all system level Graduate Business Education programs be located under the University of Maine Graduate School of Business. This version of the Graduate Certificate in Business Analytics includes an expanding portfolio of business analytics courses that are market relevant.

THE UNIVERSITY OF MAINE
Graduate School of Business

Proposal – Graduate Certificate in Business Analytics

Academic Program Alignment

1. Mission and Goals
    a. We believe the Graduate Certificate in Business Analytics supports the mission and goals of the University of Maine and the Maine Business School by preparing students for successful careers in Business Analytics through the development of applicable business skills. We believe this program will help improve the quality of life for Mainers by contributing to the professional workforce who will be responsible stewards of the business platforms that support analytical decision making.
2. Program Demand
    a. The top jobs in Business Analytics include Analyst, Quantitative Modeler, Operations Researcher, Financial Analyst, and Data Scientist. There are currently 429 Business Analyst oriented jobs listed in Maine on LinkedIn.com. The average salary for an entry level Business Data Analyst is $64,000 and the average salary for Senior Business Analyst is $99,541 in Maine according to Salary.com
3. Program Resource Needs
    a. No additional resources are needed because the course sequence is already being delivered by The USM Business Faculty and our new Associate Professor in Business Analytics. This Graduate Certificate was previously offered by USM. In addition, we hired an HAF Associate Professor in Business Analytics to help develop and deliver this program.
4. Delivery Modalities
    a. The Graduate Certificate will be delivered online.

Admission Requirements

1. An earned baccalaureate degree or its equivalent from an accredited college or university, with a minimum GPA of 2.5.
2. Earned a "B" or better in a Statistics course (that covered linear regression) within the last 5 years, or take the equivalent upon admission to the program (before taking certificate courses).
3. Completed application, two professional recommendations, all transcripts, and $65 application fee.
4. International students will also submit TOEFL (80) or IELTS scores, WES or ECE certified transcripts, and a Certificate of Finances.

Completion Requirements

1. A maximum of one course in which a grade of "C" was earned may be applied toward the requirements for the graduate certificate.
2. No more than one 3 credit course can be accepted as transfer credit.
3. Completion of 15 credit hours of course work as described in the Program Requirements.

THE UNIVERSITY OF MAINE
Graduate School of Business

Program Description

The Graduate Certificate in Business Analytics prepares students to leverage data to create more efficient business processes and more accurate performance reporting – students learn how to handle and analyze big data to help their companies better compete in the global marketplace. If you have a penchant for business analysis, statistics, modeling or information systems you may wish to consider this certificate.

Students complete fifteen credits (15 credits) of study including six (6) credits of required coursework and nine (9) credits of elective coursework, approved by the program director.

Program Requirements

Required Course (6 credits)

- BUA 680 Foundations of Business Intelligence and Analytics
- BUA 681 Data Management & Business Analytics

Elective Courses (9 credits – choose three)

- BUA 601 Data Analysis for Business
- BUA 676 Market Research and Analysis
- BUA 682 Data Pre-processing for Business Analytics
- BUA 683 Information Visualization
- BUA 684 Business Data Mining and Knowledge Discovery
- BUA 685 Problem Formulation and Decision Analysis
- BUA 686 Predictive Analytics and Business Forecasting
- ECO 530 Econometrics
- ECO 531 Advanced Econometrics and Applications
- Other Business Analytics Courses to be developed and approved by faculty

Brief Course Descriptions

BUA 601 Data Analysis for Business
This course familiarizes students with how to utilize data to inform organizational decision making. In doing so students will learn to identify business problems, then learn how to differentiate types of big data, then propose a research question, think critically about which statistical processes and applications will yield insights from the data, such that students are able to inform organizational decisions. Students will be challenged to turn data into information, describe these data effectively, and generate a professional business communication using tools found in the business workplace (Microsoft Office products normally). Prerequisites: A grade of B- or better in either an introductory statistics course or in a single variable calculus course (STS 215 or STS 232), or permission.

BUA 676 Market Research and Analysis

Study of procedures and applications of market research. Considers organization and operation of a research department, survey methods, experimentation, measurement of potential demand, analysis of distribution costs. Prerequisites: BUA 601 or equivalent, or permission.

THE UNIVERSITY OF MAINE
Graduate School of Business

BUA 680 Foundations of Business Intelligence and Analytics
This course presents the philosophical and technical foundations of business intelligence and analytics (BI&BA), a quickly emerging field with its focus on capitalizing on data to drive business decision making. We discuss the philosophical principles of BI&BA based on Bayesian Epistemology. Important fundamental concepts and tools in BI&BA are introduced using a structured and integrated approach that moves from initial data collection to final decision outcome assessment. Throughout the course, conditional reasoning and logical thinking in terms of process and systems are emphasized. Business datasets will be analyzed intensively using R, SAS, Python and Tableau, but with a minimum requirement on computer coding. Prerequisites: BUA 601 or equivalent, or permission.

BUA 681 Data Management and Analytics
This course provides a comprehensive introduction to data management using R language, an environment for statistical computing and visualization. Knowledge of basic statistics through linear regression is helpful, but not necessary. The course assumes students have had no previous exposure to computer programming. Prerequisites: BUA 601 or equivalent, or permission. Prerequisites: BUA 601 or equivalent, or permission.

BUA 682 Data Pre-processing for Business Analytics
This course is designated to enhance students' understanding of data quality problems commonly encountered in business environment, including but not limited to, missing value, noisy data and data bias. We discuss mechanisms of these problems and their impact on data analysis and modeling results, and present how to solve these problems using different data pre-processing techniques such as imputation, integration, normalization and transformation. Students practice these techniques with business datasets using R and SAS, but with a minimum requirement on computer coding.

BUA 683 Information Visualization
In this course, students will learn to create charts, maps, and other visualizations to tell stories and to create effective graphical displays of evidence. Students will learn to critically evaluate examples from print media and the internet after learning the foundations of information visualization. Prerequisites: BUA 601 or equivalent, or permission.

BUA 684 Business Data Mining and Knowledge Discovery
This course introduces students to a variety of cutting-edge data mining methods for the purposes of supervised leaning and unsupervised leaning, which include clustering methods, regression-based methods, tree-based methods, and artificial neural networks/Bayesian networks algorithms. Students will apply these methods to analyze data in different business functional areas such as marketing, accounting/finance, operation, and management across industry sectors. The course emphasis is on learning valuable data information from the data analysis results and discovering interpretable and meaningful knowledge that can support better business decision making. Analytical software (R, Python and SAS) will be used intensively to analyze real business datasets. Students are expected (but not required) to have some programming experience from some previous coursework.

THE UNIVERSITY OF MAINE
Graduate School of Business

BUA 685 Problem Formulation and Decision Analysis
This course has dual focus on business problem formulation and decision analysis. Frist, student will learn to formulate a business problem and identify its decision alternatives using systems thinking and process thinking. Second, students will learn core concepts and techniques for conducting data-driven decision analysis (e.g. utility/objective function, linear/nonlinear optimization, and simulation optimization) with the purpose of recommending optimal decision options by taking advantage of the results of predictive analytics.

BUA 686 Predictive Analytics and Business Forecasting
Predictive analytics is the scientific process of predicting future probabilities and trends. It also strives to find relationships in data that may not be readily apparent with descriptive analysis. This course introduces students to quantitative forecasting of time series in a practical and hands-on fashion. Prerequisites: BUA 601 or equivalent, or permission.

ECO 530 Econometrics
Quantitative analysis of structural economic models, forecasting and policy analysis: statistical inference and data analysis, general linear statistical model specification, estimation, and hypothesis testing, univariate time-series analysis, and estimation and use of simultaneous equation models. Practical application of econometric models through computer exercises. Prerequisites: MAT 126 and MAT 215/MAT 232, or permission.

ECO 531 Advanced Econometrics and Applications
Econometric models and techniques used in applied research: spatial data; panel data; nonlinear estimation; qualitative dependent variables; and limited dependent variables. Second of a two course sequence. Prerequisites: A "B" or better in ECO 530 or permission.

Proposal for new graduate certificate program in:

The Maine Arts & Humanities in Medicine certificate program at the University of Maine.

a. A statement of the educational objectives of the program;

The proposed Certificate, Arts & Humanities in Medicine, is the result of an inter-organizational working group, with participation from Northern Light/Eastern Maine Medical Center (NL/EMMC) that has developed this program focused on the intersection of arts, humanities and medicine. Maine's unenviable ranking in many population characteristics that contribute to poor health (e.g. obesity, food insecurity, addictive behaviors, old age, children living in poverty), along with a shortage of medical professionals, are two problems that negatively impact the State's economy and workforce development needs. We propose an imaginative solution for both issues: an unusually innovative graduate certificate program to help recruit, retain and credential medical personnel. This project has strong potential to succeed because it draws on multiple disciplines that will ultimately complement, challenge, and inspire the imaginations of practitioners and patients alike by bringing together creative producers and medical practitioners to explore creative approaches to health and wellbeing and the role of the arts and humanities in such endeavors. The proposed certificate will be a concentration within the Intermedia Program and thus draw from existing Intermedia courses as well as develop a key two-semester sequence on Arts and Medicine. The participants from Northern Light/Eastern Maine Medical Center will be supported by a Fellowship provided by Northern Light.

We choose to focus on art/humanities and medicine for the proposed certificate because of the strong potential for relatively rapid adoption by, and benefit to, the medical community in Maine, thanks to the ongoing partnership with Northern Light/ Eastern Maine Medical Center and the Intermedia Program over the last several years. If a population capable of change, growth and development is a priority, we need new models for intervention and collaboration that help the public to address the complex systems that support U.S. health care and population health in general.

Goals and objectives

Medical schools and medical education programs have begun to develop new approaches to cultivate interdisciplinary collaboration both with the medical humanities and the arts, supporting creative approaches to health related problems as well as providing the arts with a medical perspective that allows for bi-directional growth of both fields. Programs, journals, websites, and databases are dedicated to this form of interdisciplinary collaboration; however, many focus on literature that examines the

intersection of various arts and medicine. Few focus on developing art and science based projects that create new perspectives on medicine for and with the medical practitioner, where they collaboratively evolve a deeper understanding of both canons.

Together, the arts and sciences can ask each other difficult questions, share vocabularies and build trust by blending multiple perspectives on complex societal issues, such as those connected to medicine and public health. Art and design are vital from the lab to the clinic to the hospital, in terms of using creativity to help shape and understand research, patient experience, patient engagement, potential for change and medical interventions. Creativity matters in both the lab and the studio as both a reflection of the artist, the physician and/or patient within their environment, but it also has the potential to directly impact the medical encounter and the efficacy of a medicine or medical intervention.

Art and design can build creative bridges and new lines of communication between the external clinical experience and the internal turmoil within the patient. It can help shape their entire medical health experience by engaging multiple perspectives and senses, assisting the participant as they process complex layers of information and emotion. The Arts & Humanities in Medicine Certificate program is designed around a fellowship year where the physician or provider works at Northern Light/EMMC under the auspices of the Graduate Medical Education Committee while enrolled in the Program at the University of Maine. NL/EMMC would contribute support for the physician/ provider's to allow them to use 40% of their time in the Fellowship, and also opportunities for UMaine students to have projects at NL/EMMC.

b. A statement of the proposed course sequence associated with the certificate, including titles and course descriptions both for existing courses and any new courses that may be developed;

The Fellowship/ Certificate Course Sequence totals 15 credits and is designed to be completed in one year (9-12 month). No new courses are needed to initiate the program. The program will make use of the flexibility of the topics course structure of the Intermedia Programs as well as some of their existing core courses. Here is the planed sequence of classes for the Certificate

Summer (3 credits)–

IMD 500 Creative Concept development

Fall (6 credits)-

IMD 570 – Intermedia Studio Critique I, 3 credits

IMD 540 – Topics of Intermedia history/ theory, Core Seminar, 3 credits

Spring (6 credits)

IMD 540 – Topics of Intermedia history/ theory, Core Seminar, 3 credits

IMD 650 – Field Study and Research, Final project, 3 credits

Course Descriptions

IMD 500 Creative Concept development, 3 credits (five week summer class)– special version of the course that combines aspects of IMD 500/creativity, 501/theories of Intermedia and 560 Art/research and world formation.

Course Catalog Description: This course is intended to provide an in depth introduction to the theory and practice of critical thinking and creative practices that facilitate innovation and model processes that are central to creative fields in general and Intermedia in specific. Emphasis will be placed on: the conceptual and interdisciplinary nature of innovative and creative practices; an awareness of perspectives drawn from traditional creative fields, such as the arts, as well as from non-traditional forms and practices of innovation; and a focus on each individual student building a creative praxis model for their own research, development and innovative production.

IMD 570 – Intermedia Studio Critique I, 3 credits – individualized work, interaction with students/program and feedback on work

Course Catalog Description: Intended to provide an environment for guided independent art/research/production in intermedia. Emphasis placed on the conceptual and interdisciplinary nature of this art form, awareness and manipulation of traditional art boundaries, and the exploration of non-traditional art media. This is an advanced graduate-level studio course emphasizing independent levels of work, theoretical engagement in the creative process and an ongoing commitment to individual studio praxis.

IMD 540 – Topics of Intermedia history/ theory, Seminar in Medical Art and Humanities, 3 credits – we will run the MedArts Seminar under this topics course.

Course Catalog Description: This class will cover diverse, topical considerations of historical forms of Intermedia and related directions, such as Futurism, concrete poetry, installation, artists' books and multiples, Fluxus, sound art and

environmental art. Although topics will vary from semester to semester all iterations will focus on giving students an in-depth exposure to historical periods or theoretical aspects of arts creation related to Intermedial forms. In addition to the historical subjects, these classes will consider a variety of related production, practical and process explorations that will help form the basis of a praxis model for Intermedia production.

Specific topic description for core seminars
Through this seminar series students coming form the medical fields and the arts and humanities will interact to discover what each other does and how to collaborate. Students will explore weekly topics on subjects related to health and well-being and the role/function of the arts in such endeavors. Students will attend talks by visiting artists, scholars and medical practioners, develop creative projects, discuss assigned readings, and explore ideas that address the pressing needs of our healthcare system, clinical roles for artists and humanitarians, and the role of the arts and humanities for the lives and practice of doctors and clinicians.

IMD 650 – Field Study and Research, 3 credits – This course will be used for students final project research and production.

Course Catalog Description: General or topical course for credit that can be used for work in another field or study abroad when no other credit options are available. This can cover work in a professional area or field, internships, study at another approved institution for which credits are not available through other means, or other such work for the Field Research requirement of the MFA degree.

At the present time distance education technology will only be used to facilitate media presentations, visiting scholars and artists, and other materials as needed, but the courses themselves will not be distance based. In the future as the program gets more established we will explore the potential of utilizing distance technology to expand the geographic reach of this course of study.

c. A statement of how the proposed course sequences associated with the certificate will meet the stated educational objectives:

The curriculum for the Certificate as well as the structure of the yearlong set of courses is designed to provide an immersive exploration of focused creative work by the individual students. This is provided first and foremost through the design of the certificate as a small group (6-8) cadre experience bringing together student from the medical fields and students from the arts and/or humanities to work on creative works in

all medial and fields, and specifically implemented through IMD 500, IMD 570 and IMD 650 courses.

In addition to the core creative work, the focused year long seminar course, IMD 540 in both Fall and Spring, contains a central focus on issues of family medicine, existing and potential connections between the arts/humanities and medicine, a holistic approach to wellbeing and quality of life (for both patient and practitioner) and will bring in a variety of participating scholars, artists, humanists and medical practitioners to work with students in the program.

The program will be capped/concluded with each student engaging in a process of research and creative production that leads to a final project that delves into some aspect of the arts/humanities and medicine.

d. A statement of the need for the proposed program and the basis for such a need, supported by either externally or internally derived data:

The Problem: Maine holds the dubious distinction of being the oldest, whitest, and most rural state in the Nation. While we rank 33rd among the fifty states with regard to average per capita income, each of the northern tier of counties has a lower per capita income than every state in the nation except Mississippi.

The intertwined problems of an aging, dispersed, poor, and homogenous population tend to compound one another. As communities age, fewer people are able to assist with essential services — education, healthcare, civic leadership — let alone perform volunteer services. Lack of jobs, adequate housing, and public transportation leads to a youth drain, while many of those who stay struggle with addiction and mental illness at higher rates than their urban counterparts. This situation is further exaserbated by the fact that in the last 15 years, 160 rural hospitals have closed (Frakt, 2019). Emergency Medical Systems (EMS), which rely on volunteers for their workforce, are widely endangered (Edwards, 2019). The physician-to-population ratio is expected to fall by 23 percent in the next decade, and those who choose to work in rural areas will not have the range of skills or tolerate the workload of their predecessors (Skinner et al., 2019). The opioid crisis and need for mental health services will remain entrenched in poverty, domestic violence, social neglect, and lack of social and financial opportunity of the small town. More of the meeting places of rural America — the post office, general store, church hall, local school — will be boarded. Rural communities are losing their sense of community, and, as Wendell Berry (1994) has said, "health is membership" in community.

Within the medical profession, community is disappearing as the result of a documentation system (the Electronic Medical Record or EMR) that absorbs over half of the physician's time and energy. Doctors explore only those relevant details that a screening tool, risk stratification checklist, or a subordinate has highlighted for them. Health professionals are less invested in the communities they serve and less likely to express their own innate creativity and problem-solving capacity. More than half of practicing physicians report symptoms of burnout. When physicians lose a sense of fulfillment and efficacy in their work, job performance suffers, patient satisfaction declines, and doctors retire early or leave their practice.

The Arts have been defined as an expression of knowledge that includes creative media, which are conveyed in different forms, such as drawing, photography, painting, dance, poetry, sculpting, music, and more (Chinn & Kramer, 2011). Art stimulates an individual's response to experience (Lapum, 2005; Boydell, 2011; Chinn and Kramer, 2011; Lapum et al., 2012a, 2014). and generates meanings for individuals as they observe, create and interpret it (Walji-Jivraj & Schwind, 2017). In this way, it produces diverse interpretations and encourages individuals to engage in creative processes. Blending science and art can improve healthcare outcomes and promote interprofessional development (State of the Field Committee, 2009).

E. The names of at least 2 Graduate Faculty members associated with or contributing to the certificate program, either by teaching one or more of the courses associated with the program or participating in the design of the course sequence.

Owen Smith (academic advisor and teach two courses_

Susan Smith (teach courses)

[Note – in process of getting ROQs in for three key Medical faculty to teach in the program, Patrick McFarlane, David Loxtercamp and Lewis Mehl-Madrona once approved they will be added to above list]

Dedicated faculty:

Owen Smith, Ph.D.	Program Administrator & Academic Director
Patrick McFarlane, MA, NP.	Artistic Director
David Loxterkamp, MD, MA	Seminar Director

Steering Community:

Sarah Irving	Director, Northern Light Family Medicine & Residency
Lewis Mehl-Madrona	Faculty, Northern Light Family Medicine & Residency

Mollie Ruben	Assistant Professor of Psychology, University of Maine
David Harder	University Research Professor of Medicine, University of Maine

Numerous adjunct faculty and professionals will be drawn from the Northern Light Family Medicine Residency Program, the University of Maine, and the wider arts, cultural, and civic community across Maine in support of the educational goals of the Fellowship.

UNIVERSITY OF MAINE SYSTEM
NEW GRADUATE PROGRAM PROPOSAL
JANUARY 2020

I. Full Program Title

Degree: Master of Science
Area: Data Science and Engineering
CIP Code: 30.3001

Persons Responsible for Planning

Kate Beard, Professor, Spatial Informatics, co-lead
Penny Rheingans, Director, School of Computing and Information Science, co-lead
Ali Abedi, Professor, Electrical and Computer Engineering
Kathleen Bell, Professor, School of Economics
David Hiebeler, Professor, Mathematics and Statistics
Shaleen Jain, Professor, Civil and Environmental Engineering
Tora Johnson, Associate Professor, Geographic Information Systems, UMM
Ben King, Assistant Professor, Molecular and Biomedical Science
Yonggang Tim Lu, Associate Professor, Maine Business School
Craig Mason, Professor, Education and Applied Quantitative Methods
Judith Rosenbaum, Associate Professor, Communication and Journalism
Salimeh Yaseai Sekeh, Assistant Professor, Computer Science
Yifeng Zhu, Professor, Electrical and Computer Engineering
University of Maine, Orono, ME 04469

II. Program Objectives

We propose a M.S. degree in Data Science and Engineering to train students in the management, analysis, and visualization of large and complex data sets as a hybrid degree with both on-line and in-class options. The near-term goal is that the graduate program may be completed entirely on the campus in Orono, entirely online, or through a combination of courses taken online and on-campus at the Orono and other UMS campuses. Ultimately, as a general rule, students participating in courses online view class videos and accomplish assignments at any time throughout the week. They have the weekly opportunity to participate in a one to two-hour "live" discussion session with the professor at a mutually convenient time for distance class members prior to due dates for weekly assignments. Many of the graduate courses are already offered under this dual method of offering the course live for on-campus students with students at a distance viewing the class sessions at times that meet their schedules. Initially, some thematic core and domain specialization courses will be offered only on-campus with the expectation that over time, a majority of courses offered from UMaine will move to either

hybrid dual or solely online versions. Regardless, it will be possible to earn the degree immediately online even though the selection of thematic core and domain specialization courses may be limited initially.

The program includes a set of core courses grouped in themes and a set of domain specialization courses. Students may focus solely on the Data Science and Engineering core or tailor the degree to emphasize one or domain specializations. To complement both thematic core and domain specializations, some courses may be taken in-class or by distance from other Maine universities if pre-approved for inclusion in graduate student Programs of Study assuming that other program requirements are met.

A. Program Rationale

Data science and engineering has become a critical skill field for the 21st century. Data science and engineering addresses the challenges of capturing, curating, managing, processing, analyzing, and translating massive, complex, heterogeneous, and dynamic data into manageable forms, new information, and insights. A host of new technologies (advanced computer modeling, smart sensor networks, high-precision lab instruments, wireless telecommunications, smart devices, and social media) are generating data collections at unprecedented rates. There are numerous new applications for such data in engineering, environmental, and social sciences as well as in business, industry, and government. The pervasive application of artificial intelligence (AI) techniques in continuous mining of big data across diverse domains is now viewed as essential by businesses and government in improving decision-making and acquiring insights that were not previously possible. For businesses, governments and academic institutions throughout Maine and beyond there is a growing need for a workforce well trained in exactly such skills.

Data science and engineering is intrinsically transdisciplinary. In this emerging and rapidly evolving field, precise definitions and boundaries do not yet exist. The terms "data science" and "data engineering" are used in overlapping ways, with "data science" or "data science and engineering" usually used to indicate the field in a broad sense. Representative descriptions of data science include:

- "novel mix of mathematical and statistical modeling, computational thinking and methods, data representation and management, and domain expertise" (Computing Research Association, 2016).
- "draws on diverse fields (including computer science, statistics, and mathematics), encompasses topics in ethics and privacy, and depends on the specifics of the domain to which it is applied " (National Academies, 2018).

We have called this proposed program "data science and engineering" as both a clear indication of the disciplinary breadth and an acknowledgment of its roots in the UMaine

Emerging Area in Data Science and Engineering. For brevity, we will sometimes call the topic simply "data science."

Data science and engineering relies on a novel mix of mathematical and statistical modeling, computational thinking and methods, data representation and management, effective information presentation, and consideration for responsible use of data in the context of various fields of domain expertise. Data science and engineering requires a deep understanding of how data are acquired and an understanding of the semantics of the data, which strongly influences how data are acquired, stored, accessed, analyzed, and presented. Data lineage, data quality, quality assurance, data integration, storage, privacy, security, and scalable systems and data architecture for big data are all critical topics in a robust data science program. Longer-term management and reuse of data is also becoming critical, so longer-term curation and data preservation must also be addressed.

The University of Maine has a solid foundation of existing strengths and resources for developing Data Science and Engineering graduate programs. The programs will draw upon faculty and courses from throughout the University and other UMS campuses. A few initial domain specializations are outlined below. Additional domain specializations are being developed through collaboration among multiple units on campus. The list of faculty below is indicative of the breadth of this collaboration at UMaine and beyond.

B. General Program Goals

The objective of the Data Science and Engineering M.S. program is to meet the growing demand for graduates with core skills in managing and analyzing complex data and analytics challenges. The degree will provide a pathway for students from diverse fields to transition to multiple data science and engineering career paths by providing them with core graduate level courses across the entire spectrum of the data lifecycle. In support of the interdisciplinary spirit of data science and engineering, the program is designed to accommodate students from a wide range of undergraduate degrees or other graduate degree backgrounds with options for specialization in different domains. A collection of hybrid courses with in-class and online options will support students in residence as well as meet the needs of people currently in the workforce or who are otherwise place-bound and need training or retraining in the area of Data Science and Engineering.

C. Program Goals and Learning Objectives

Graduates of this program will achieve the following learning objectives:

- an appreciation of data sources, the data acquisition process, data types, data quality, and methods for cleaning.

- an understanding of issues impacting the efficient processing, representing, storing, managing, and retrieval of large amounts of data.
- an understanding of how to leverage modern computational infrastructures and software tools to perform large-scale data analysis and machine learning.
- an understanding of common analytical tools, their methods, their effective use, and the strengths and limitations of each.
- the skills to effectively explore and present data to different audiences through visual and multimodal methods.
- a familiarity with data security, curation, and preservation strategies
- the ability to form questions for analysis from an understanding of the characteristics and goals of different application domains.
- an awareness of the ethical issues, risks, and responsibilities related to data science.

Students will have an option to complete a 30-credit MS degree or a 15-credit graduate certificate.

III. Evidence of Program Need

A. Workforce Needs

The importance of data science and engineering to all fields is predicted to grow exponentially and has prompted the launch of cross-agency federal research programs in data science. Six federal departments and funding agencies (NSF, NIH, DoD, DARPA, DoE, and USGS) have prioritized an initiative to accelerate the pace of knowledge discovery in large datasets [OSTP, 2012]. In the business world [Forbes, 2012], forecasts put the yearly demand for roles relating to data development, data science, and data engineering to reach almost 700,000 openings by 2020. It has also been reported that the United States faces a shortage of more than 140,000 trained personnel to manage and analyze big data [Manyika et al., 2011]. The Business-Higher Education Forum (BHEF) in 2019 projected continuing demand for graduates with data science and analytical skills [AMSTAT]. The workforce need is so great and UMaine expertise is so well established that *Data Science and Engineering* has been officially recognized by the University of Maine as an *Emerging Area of Excellence* worthy of special attention in providing support [UMaine SEA].

Market analysis using Burning Glass [BG 2019] of the workforce areas overlapping with the proposed program show substantial demand and anticipated growth (a specific Classification of Instructional Programs (CIP) code from the Department of Education for programs in Data Science will be introduced in 2020). Expected job growth in Maine of these occupations averages 8% in the next ten years, with particularly high growth expected in the areas of business intelligence, software development, network and systems engineering, IT management, and database management. The average projected salary for such jobs is over $94,000, with expertise in data science topics such

as big data and DevOps bringing a salary premium. Expected growth in the broader New England area and nationwide is even stronger with expected growth of 14% and 16%, respectively, along with average salaries of $102,992 and $101,096.

B. Targeted Audiences Related to the Need for Graduate Education in this Field

The advanced knowledge provided by graduate-level data science programs is needed across a wide range of commercial, non-profit, and government settings. Individuals in all areas of private and public enterprise need data science skills for data management, analytics, planning, and decision support. Maine's industry and businesses, such as WEX, IDEXX Laboratories, Jackson Laboratory, Bath Iron Works, Humana, Unum, US Bancorp, Applied Thermal Sciences, and GWI, and startup companies such as CashStar and GreenPages Technology Solution, among many others stand to profit from data science and engineering research. In particular, we address the need for trained data analysts, which Maine's Department of Labor predicts to grow the fastest among all computer-related jobs in Maine.

Students from a wide range of academic backgrounds will be eligible to pursue this program. We illustrate some possible combinations of backgrounds and goals through the following example students:

- *Business student* with a background including a deep understanding of the business domain, some statistics and potentially more math, but likely not programming. Such a student would be motivated to understand how scientific and analytic methods fit into the business domain to improve decision-making.
- *Economics* student with a background including some statistics and mathematics, deep domain knowledge, and potentially economic modeling experience. Such a student would be motivated to broaden and further strengthen their technical and analytical expertise with methods and skills from data science and engineering. Potential employers might hire them for data analytics positions and to solve domain-specific applications.
- *Engineering student* with a strong STEM background including programming, statistics, and more math. Such a student would be motivated to strengthen their technical expertise with methods and skills from data science and engineering. For such a student, the tie to application domain would be an advantage for retention. Potential employers might hire them to design new platforms or develop new tools that demand strong skills in programming or hardware knowledge.
- *Math/statistics student* with a background including statistics, more math, but probably not programming. Such a student would be motivated to increase experience and interaction with industry and application domains.
- *Computing student* with a background including programming, statistics, and likely more math. Such a student would be motivated by an interest in exploring the technical aspects of data science or increasing their domain foundation.

Potential employers might hire them to design new platforms or develop new tools that demand strong skills in programming or application knowledge.

- *Ecology/environmental science student* with a background including some statistics, deep domain knowledge, and possible experience with the government/regulatory context of decision-making. Such a student would be motivated to increase their analytics skills and expertise. Potential employers might hire them to solve domain-specific applications.
- A student in the *Social or Behavioral sciences* with a background and interest in applied quantitative methods and innovative strategies for collecting, managing, analyzing, and communicating data to researchers, the public, and policy makers. Graduates would go on to assume data-focused roles in research labs, health centers, government agencies, and private industry.

C. Similar Programs Offered by Other Universities

Over 30 universities offer an online M.S. degree or certificate in Data Science. Some of these programs offer specializations, such as analytics, artificial intelligence, or data engineering. Part-time and full-time enrollment options are available for on-line data science degrees. Within the New England region, the following data science programs are offered:

Massachusetts: MIT: MicroMasters® program in Statistics and Data Science, Harvard: Graduate Certificate in Data Science, Master of Science in Computational Science and Engineering. Northeastern University: Master of Science in Data Science, Master of Professional Studies in Analytics, Graduate Certificate in Data Analytics. Boston University, UMass Amherst, and UMass Boston all offer graduate certificates in Data Analytics and/or Business Analytics. Bay Path University: Master of Science in Applied Data Science.

Connecticut: Yale University: Certificate in Data Science, Ph.D. in Statistics and Data Science. Central Connecticut State University: Graduate Certificate in Data Mining, Master of Science in Data Mining; Wesleyan University: Certificate in Applied Data Science

New Hampshire: New England College: Master of Science in Data Analytics and Business Statistics. Southern New Hampshire University: Master of Science in Data Analytics; University of New Hampshire: Graduate Certificate in Data Science (online), Graduate Certificate in Analytics, Master of Science in Analytics.

Vermont: University of Vermont: Master of Science in Biostatistical Sciences, Masters in Complex Systems and Data Science

Rhode Island: Brown University: Master of Science in Data Science – Campus only

University of Maine System: As the flagship campus of the UMS, UMaine has invested heavily in research-active faculty who bring a depth and expertise to the courses they will offer as part of this program. The opportunity to take graduate courses along with students in research-oriented graduate programs from faculty actively engaged in research is relatively unusual in Data Science MS programs and will provide substantial advantages to students. Individuals involved from the **University of Maine** and **University of Maine Machias** campuses are listed under the Personnel Section below.

The **University of Southern Maine (USM)** is also developing a Data Science graduate program proposal. From conversations with the leaders of that initiative (Bruce MacLeod of the Department of Computer Science, Muhammad Al-Taha of the Mathematics and Statistics Department, Matthew Bampton of the Muskie School of Public Service, all at USM), we believe the programs will be different and highly complementary, with students benefiting from the opportunity to choose between them or draw upon the resources of both. The programs will be different in flexibility, delivery method, and expected preparation of students. In its most recent circulated draft, the USM program would consist of seven specific core courses with electives available in a number of tracks, with all courses delivered only face-to-face. Students would be required to have a specific background in programing, calculus, probability, and statistics (ie, identical to entrance requirements for their MS in Statistics with an additional programming requirement), with required remedial work for those without that background. The proposed UMaine program offers a broader range of paths into and through the MS degree and thus allows students with greater variations in undergraduate backgrounds to pursue the UMaine graduate program. Initially, the courses included in the UMaine Data Science program will be a mix of those available either face-to-face or online; in time, virtually all will have online options. We are engaged with the leaders of the USM proposal about ways that the two programs might best support each other. We believe the two programs can share some course offerings as a way to obtain the most benefit from resources, while providing the most flexibility for students. We have also identified promising potential for shared term projects, with team members distributed between the two universities. We will continue our conversations about ways the two programs can best support each other.

Dr. Matthew Dube, lead proposer for an undergraduate Data Science degree at the **University of Maine at Augusta** (UMA) has been engaged in discussions of the potential for sharing upper level courses and providing a pathway for students completing the undergraduate degree from UMA to continue in Data Science, through the development of a joint Double Up (4+1) offering. That is, by double counting up to three courses, a UMA graduate may complete the MS Data Science in a single year beyond the BS.

All UMS campuses that offer academic courses at the 400-level or above that are suitable for inclusion in a MS Data Science and Engineering graduate program were contacted. We are particularly interested in engaging instructors on these campuses that are able and willing to teach such courses through distance technologies. We are providing flexible options for students to include selected courses from other Maine universities (pre-approved, 400-level and above taken in-class or by distance) in their graduate student Programs of Study. See Section IV for details on Maine campuses to be involved. More may be added over time.

D. Enrollment Projections for Five Years

The target enrollment goals over the first five years are as follows:

2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
10	17	25	30	30

Because the program is designed to attract students from a broad range of undergraduate degrees and the program will be offered both on-campus and by distance, we believe the target enrollment numbers listed are conservative. These are numbers we can readily handle with existing course offerings and faculty advisors. Indeed, the demand may be higher.

IV. Program Content

A. General Program Description

The Data Science and Engineering program blends mathematical and statistical modeling, with computational methods, data representation and management, effective presentation for human consumption. General skills for managing and analyzing data can benefit from domain knowledge or interaction with domain experts. This program thus provides options and pathways to enrich general data science and engineering skills development with domain specialization.

The University of Maine Data Science and Engineering graduate programs and courses provide students with foundational knowledge and an overview of data science. They also provide students with the ability to specialize or gain breadth across a broad range of data science and engineering topics. While foundation and overview courses are interdisciplinary and some will be taught by teams from multiple disciplines, specialty courses included within the graduate programs are typically drawn individually from multiple and numerous disciplines.

Program Options: The University of Maine proposes to offer the following graduate programs in Data Science and Engineering:

MS Data Science and Engineering (MS DSE) with a ***Thesis Option*** (24 credits of coursework and six thesis credits) and a ***Coursework Option*** (30 credits of coursework requiring three of the credits to be a project or internship course),
Graduate Certificate in Data Science and Engineering (15 credits of coursework)
Double Up [4+1] Option. For this option, any qualifying undergraduate student in any degree program at the University of Maine may begin this option in their junior year enabling them to complete their bachelor's degree and the MS DSE in five years. This option will be open to other UMS campuses on a case-by-case basis.

Admission Requirements: Students with undergraduate degrees in any field may apply. Candidates with two semesters of calculus (e.g., MAT 126, 127), a semester of statistics (e.g., STS 232), and proficiency in programming will have more options for classes they may pursue. Thus, students without these background prerequisites will be required to take foundation courses in which their background is lacking. The foundation courses will count towards the degree and will better prepare students for several of the more advanced courses. However, all students need to pay close attention to prerequisite courses in the core theme and domain specialization areas and either meet the prerequisites or choose alternative courses.

Program Requirements:

(1) MS Data Science and Engineering (MS DSE) with ***Thesis Option.*** The candidate must complete 30 credits consisting of:
- (a) Required Courses: DSE 5xx Practicum in Data Science and Engineering (3cr), SIE 501 Introduction to Graduate Research (1cr), SIE 502 Research Methods (1cr), and INT 601 Responsible Conduct of Research (1cr)
- (b) 12 course credits from at least four of the five Core Theme Areas
- (c) 6 further course credits from within the Foundation Courses, Theme Areas, or Domain Specializations
- (d) 6 credits of thesis

(2) MS Data Science and Engineering (MS DSE) with ***Coursework Option.*** The candidate must complete 30 credits consisting of:
- (a) Required Courses: DSE 5xx Practicum in Data Science and Engineering (3cr)
- (b) 12 course credits from at least four of the five Core Theme Areas
- (c) 15 further course credits from within the Foundation Courses, Theme Areas, or Domain Specializations
- (d) At least one course must include a substantial practical experience. Options include SIE 589 Graduate Project, SIE 590 Information Systems Internship, or a course from an approved list.

(3) ***Graduate Certificate in Data Science and Engineering (GC DSE).*** The candidate must complete 15 credits consisting of:
   (a) Required Courses: DSE 5xx Practicum in Data Science and Engineering (3cr)
   (b) 9 course credits from at least three of the five Core Theme Areas
   (c) 3 further course credits from within the Foundation Courses, Theme Areas, or Domain Specializations

(4) ***Double Up [4+1] Option*** (https://umaine.edu/graduate/programs/doubleup/). The candidate must apply for admission to the Double Up [4+1] Program before or during their undergraduate junior year. An applicant should expect to have an overall minimum undergraduate grade point average of 3.25, must have completed at least a semester course in calculus, and must have three letters of recommendation from current or previous university instructors. In the senior year, provisionally admitted students must submit a formal application to the Graduate School. Provisionally admitted Double Up students with an undergraduate grade point average of 3.25 or better may take up to 9 credits of graduate-level courses in Data Science and Engineering toward the ***MS DSE Coursework Option.*** These graduate courses may also count towards the Bachelor's degree (joint credits) but they must also be part of the student's Master's Program of Study in Data Science and Engineering. Upon graduation with a bachelor's degree, and with satisfactory performance in courses taken as an undergraduate, the student may be formally matriculated into the master's program. Students who meet these requirements must matriculate in their master's program within one semester/term after receiving their bachelor's degree in order to use the joint credits.

C. Outline of Courses

Please note that in the listings of courses that follow, several courses have been included from other Maine campuses that may be highly appropriate for some students to take and include in their graduate programs of study. The listings of external courses from other UMS campuses in the tables below are not exhaustive and are likely to grow over time. Although the Graduate School policy is to allow up to two appropriate courses (six credits) to be transferred from other universities as a matter of course, we are proposing in this instance that up to three vetted external courses be allowed to be included on student graduate programs of study as a matter of course and perhaps more might be accepted through a special exception process.

While explicit prerequisite courses are listed for some courses in the tables that follow, equivalent courses or backgrounds are typically accepted by instructors. Different applicants will have different academic backgrounds enabling them in consultation with their advisors to select among course paths that meet their background and interests. Course instructors and advisors will work with students to ensure that adequate backgrounds exist so that students are likely to succeed in their mutually chosen course path through the curriculum.

Foundation Courses. Admitted candidates missing appropriate background prerequisite courses will take these foundation courses as appropriate and as advised by their graduate committee and/or advisor. The foundation courses may count towards the degree if approved on the student's Graduate Program of Study. The three Foundation Courses include:

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
DSE5xx	Statistical Foundations of Data Science and Engineering	3	One semester calculus	Yes, in 2020	Orono
	or	3			
STS437	Statistical Methods in Research	3	Some statistics	No	Orono
	or				
ECE515	Random Variables & Stochastic Processes		ECE 316	Yes	Orono
DSE5xx	Programming Foundations of Data Science and Engineering	3	Program admission or instr. permission	Yes	Orono
	or				
SIE507	Information Systems Programming			Yes	Orono
DSE5xx	Systems Foundations of Data Science and Engineering	3	Familiar with one programming language	Yes	Orono

- **DSE 5xx Statistical Foundations of Data Science and Engineering.** DSE 5xx Statistical Foundations of Data Science and Engineering. This course introduces a broad range of statistical methods that are used to solve data-driven problems. The main learning objectives are to formulate statistical techniques to pre-process, analyze, validate, predict, and explain big datasets. Students will be introduced to fundamental statistical concepts and algorithms and will have a broad knowledge of required statistical tools in data analysis. Students will obtain hands-on experience in processing big data, applying statistical methods, such as estimation, maximum likelihood, hypothesis testing, regression, and prediction, on real-world datasets from a variety of domains.
- **DSE 5xx Programming Foundations of Data Science and Engineering.** This course is designed to expose students to various high-level concepts that can be used to process, visualize and analyze large datasets. Students will build

algorithmic and programming skills including data representation, control structures, iteration, abstraction, program design, and debugging. No programming experience is necessary.

- **DSE 5xx Systems Foundations of Data Science and Engineering.** This course provides an introduction and overview of the underlying building blocks of big data stack architecture and infrastructure. It covers the foundational concepts and techniques of data acquisition, data storage, high-performance computing, and parallel data analysis. It provides hands-on experiments using advanced computing platforms and modern software tools to perform parallel data-intensive computing.

Required Course in All DSE Graduate Programs. Whether in a graduate degree or graduate certificate program, all students must complete the following introductory course. This is a new interdisciplinary team-taught course that will be structured around an overview of data science and engineering topics and tools as applied to large case study data sets.

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
DSE5xx	Practicum in Data Science and Engineering	3	Program admission or instr. permission	Yes, in 2020	Orono

- **DSE 5xx Practicum in Data Science and Engineering.** This course provides an overview of the core themes and concepts of data science and engineering through practical experience with data from an actual application domain. One novel model for this course would be beginning and concluding segments addressing domain-agnostic content that would be taken by all students, with the choice of one or more 1-credit domain case studies in the middle of the semester. This choice of domain case study would allow students to further personalize their program to their interests and goals.

Data Science and Engineering Core Themes. The program builds upon five core themes, specifically:

Theme 1: Data Collection Technologies
Theme 2: Data Representation and Management
Theme 3: Data Analytics
Theme 4: Data Visualization and Human Centered Computing
Theme 5: Data Security, Preservation, and Reuse

Additions and deletions to the courses listed under each of the themes are likely to occur over time as the field changes and as a result of assessments over time. A single course may not count under more than one theme or domain specialization category. Courses currently contained within the core themes include the following:

Theme 1: Data Collection Technologies

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
BUA682	Data Pre-processing for Business Analytics	3	Intro stats and some programming	Yes	MBS
ECE533	Advanced Robotics	3	Program admission or instr. permission	?	Orono
ECE571	Advanced Microprocessor-based Design	3	Program admission or instr. permission	?	Orono
ECE585	Fundamentals of Wireless Communications	3	ECE 484	Yes	Orono
SFR5xx	Advanced Remote Sensing Analysis and Applications	3	Instr. permission	No	Orono
SFR609	Remote Sensing Problems	3	Instr. permission	No	Orono
SIE559	Geosensor Networks	3	Program admission or instr. permission	Yes	Orono
SMS540	Satellite Oceanography	3	SMS 501 and SMS 541 or permission	No	Orono
SVT437	Practical GPS		SVT 341	Yes	Orono
SVT531	Advanced Digital Photogrammetry	3	None listed	Yes	Orono

SVT532	Survey Strategies in Use of Lidar	3	None listed	Yes	Orono

Theme 2: Data Representation and Management

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus	
BUA681	Data Management and Analytics	3	Intro stats and some programming	Yes	MBS	
COS580	Topics in Database Management Systems	3	Instr. permission	No	Orono	
COS5xx	Cloud Computing	3	tba	No	Orono	
ECE574	Cluster Computing	3	Program admission or instr. permission	?	Orono	
ECE583	Coding and Information Theory	3	Program admission or instr. permission	Yes	Orono	
SIE550	Design of Information Systems,	3	Program admission or instr. permission	Yes	Orono	
SIE557	Database Systems Applications,	3	Program admission or instr. permission	Yes	Orono	
SIE580	Formal Ontologies: Principles and Practice	3	Program admission or instr. permission	Yes, 2019	Orono	

Theme 3: Data Analytics

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus	
BIO593	Advanced Biometry	3	Course in statistics	No	Orono	
BMB520	Introduction to Image Analysis	3	Program Admission	??	Orono	
BUA681	Data Management and Analytics	3	Intro stats and some programming	Yes	MBS	
BUA684	Business Data Mining and Knowledge Discovery	3	Intro stats and some programming	Yes	MBS	
CMJ601	Seminar in Research Methods	3	permission	No	Orono	
COS570	Introduction to Artificial Intelligence	3	Instr. permission	No	Orono	
COS5xx	Machine Learning	3	?	Yes	Orono	
COS5xx	Computer Vision	3	tba	No		
ECE515	Random Variables and Statistical Processing	3	Program admission or instr. permission	Yes	Orono	
ECE577	Fuzzy Logic	3	Program admission or instr. permission	No	Orono	
ECE584	Estimation Theory	3	Program admission or instr. permission	Yes	Orono	

ECE590	Neural Networks	3	Permission	No	Orono	
ECE598	Deep Learning	3	Program admission or instr. permission	No	Orono	
ECO530	Econometrics	3	MAT 126 & MAT 215/MAT 232, or permission	No	Orono	
ECO531	Advanced Econometrics & Applications	3	B or better in ECO 530 or permission	No	Orono	
ECO532	Advanced Time Series Econometrics	3	ECO 530 or permission	No	Orono	
EHD572	Advanced Qualitative Research	3	EHD 571 or equivalent	No	Orono	
EHD573	Statistical Methods in Education I	3	None listed	Yes	Orono	
EHD574	Statistical Methods in Education II	3	EHD 573 or equivalent	Yes	Orono	
PSE509	Experimental Design	4	None listed	No	Orono	
PSY540	Advanced Psychological Statistical Methods and Analysis I	3	PSY 241 or equivalent	No	Orono	
PSY541	Advanced Psychological Statistical Methods and Analysis II	3	PSY 241 or equivalent	No	Orono	
SFR528	Qualitative Data Analysis in Natural Resources	3	EHD 571 or permission	No	Orono	

SIE5xx	Natural Language Processing	3	tba	Yes	Orono	
SMS595	Data Analysis Methods in Marine Sciences	3	MAT 126 or equivalent	No	Orono	
STS531	Mathematical Statistics	3	C or better in MAT 425, STS 434 or permission	No	Orono	
STS533	Stochastic Systems	3	C or better in STS 434	No	Orono	

Theme 4: Data Visualization and Human Centered Computing

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
BUA683	Information Visualization	3	Intro stats and some programming	Yes	MBS
COS565	Data Visualization	3	COS 226, SIE 507, or permission	No	Orono
SIE515	Human Computer Interaction	3	Program admission or instr. permission	Yes	Orono
SIE516	Virtual Reality: Research and Applications	3	Program admission or instr. permission	No	Orono
SIE5xx	Spatial Interaction Design	3	tba	Yes	Orono

Theme 5: Data Security, Preservation, and Reuse

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
COS5xx	Engineering Privacy in Software Systems	3	tba	Yes, 2020	Orono
DIG500	Introduction to Digital Curation	3	None listed	Yes	Orono
DIG510	Metadata Systems	3	DIG 500 recmmdd	Yes	Orono
DIG550	Digital Preservation	3	DIG 500, 510, & 540 recmmdd	Yes	Orono
SIE525	Information Systems Law	3	Program admission or instr. permission	Yes	Orono
CYB 501	Cybersecurity Fundamentals	3	Graduate Standing	Yes	Augusta*
CYB 520	Cybersecurity Policy and Risk Management	3	Graduate Standing	Yes	Augusta*
CYB 551	Cybersecurity Investigations	3	Graduate Standing	Yes	Augusta*

* - Only 3 external courses in total (9 credits) may be included on a student's Graduate Program of Study.

Data Science and Engineering Domain Specializations. The current domain specializations include:

Domain A: Spatial Informatics
Domain B: Bio-Informatics/Biomedicine
Domain C: Business Information
Domain D: Social and Behavioral Data Science
Domain E: Engineering Analytics

Additions and deletions to the courses listed under each of the domain specializations are likely to occur over time as the field changes and as a result of course assessments over time. A single course may not count under more than one theme or domain specialization category. Courses currently contained within the domain specializations include the following:

Domain A: Spatial Informatics

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
SIE505	Formal Foundations for Information Science	3	Program admission or instr. permission	Yes	Orono
SIE509	Principles of Geographic Information System	3	Program admission or instr. permission	Yes	Orono
SIE510	GIS Applications	3	Program admission or instr. permission	Yes	Orono
SIE512	Spatial Analysis	3	Program admission or instr. permission	Yes	Orono
SIE555	Spatial Database Systems	3	Program admission or instr. permission	Yes	Orono
SIE558	Real-time Sensor Data Streams	3	Program admission or instr. permission	Yes	Orono
INT527	Integration of GIS and Remote Sensing Data Analysis in Natural Resource Applications	3	Permission & grad standing	No	Orono
SFR 500	Applied GIS	3	Instr. Permission	No	Orono
SMS595	Data Analysis Methods in Marine Sciences	3	MAT 126 or equivalent	No	Orono
CIS 461	Spatial-Temporal Information Science	3	CIS 360 or permission	Yes	Augusta*
GEO605	Remote Sensing	3		No	USM*
GIS 428	Web-Based Maps, Applications & Services	3	GIS 230 and GIS 330, or permission	Yes	Machias *

GIS 500	GIS I	3	Permission	Yes	Machias *
GIS 5xx	Municipal Applications of GIS	3	GIS 500 or permission	Yes	Machias *
GIS 600	GIS II	3	Permission	Yes	Machias *
GIS 6xx	Community Applications of GIS	3	GIS 500 or permission	Yes	Machias *
GIS 6xx	Remote Sensing & Image Analysis	3	GIS 500 and GIS 600, or permission	Yes	Machias *

* - Only 3 external courses in total (9 credits) may be included on a student's Graduate Program of Study.

Domain B: Bio-Informatics/Biomedicine

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
BMB502	Introduction to Bioinformatics	3	BMB 280 or permission	No	Orono
BMS625	Foundations of Biomedical Science and Engineering	1 - 4	None	No	Orono
ECE583	Coding and Information Theory	3	ECE 515 or permission	Yes	Orono
SIE505	Formal Foundations for Information Science	3	Program admission or instr. permission	Yes	Orono

Domain C: Business Information

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
BUA680	Foundations of Business Intelligence and Analytics	3	Intro stats	Yes	MBS

BUA684	Business Data Mining and Knowledge Discovery	3	Intro stats and some programming	Yes	MBS
BUA685	Problem Formation and Decision Analysis	3	Intro stats, econ prin and some programming	Yes	MBS
BUA686	Predictive Analytics and Business Forecasting	3	Intro stats and some programming	Yes	MBS
CIS450 / BUA450	Data Mining	3	CIS 255 or CIS 352 or CIS 360 or CIS 449 or permission	Yes	Augusta*

* - Only 3 external courses in total (9 credits) may be included on a student's Graduate Program of Study

Domain D: Social and Behavioral Data Science

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
HTY 665	Digital and Spatial History	3	Grad standing	Yes	Orono
CMJ 593	Special Topics in Communication: Social Media and Digital Cultures	3	Instr. permission	No	Orono
SFR 5XX	GIS for Social Science	3	Instr. permission	Yes	Machias

Domain E: Engineering Analytics

Course Number	Course Title	Crdts	Prerequisites	By Distance	Campus
ECE 515	Random Variables and Stochastic Processes	3	graduate standing, ECE 316 or equivalent	Yes	Orono

ECE 533	Advance Robotics	3	ECE 417 or permission.	No	Orono
ECE 571	Advanced Microprocessor-based Design	3	ECE 471 or permission.	No	Orono
ECE 585	Foundations of Wireless Communication	3	ECE 484	Yes	Orono
ECE 574	Cluster Computing	3	ECE 177 or permission	No	Orono
ECE 583	Coding and Information Theory	3	ECE 515 or permission	Yes	Orono
ECE 523	Mathematical Methods in Electrical Engineering	3	Senior or graduate standing	No	Orono
ECE 577	Fuzzy Logic	3	ECE 477 or permission	?	Orono
ECE 584	Estimation Theory	3	ECE 515 or permission	Yes	Orono
ECE 590	Neural Networks	3	Graduate student or permission	No	Orono
ECE 598	Deep Learning	3	Graduate student or permission	?	Orono

C. Development of New Courses

Courses indicated with xx in the numbering column of the courses are not yet fully approved. Some are well along in the planning stages and are part of the regular process of reevaluating, revising, and renaming courses as the participating graduate programs evolve over time. ISuch courses should be part of the teaching loads of existing or newly incoming professors, in order to guarantee availability of important required and elective courses. Upon approval of the proposal, any and all such indicated courses will be moved through campus approval processes if they have not already begun that process.

D. Research in Program Design

Data science and the engineering of new methods and systems for analyzing and processing the immense data streams of our time are high priorities for federal agencies as indicated in Section III.A. The ***MS Data Science and Engineering (Thesis Option)*** program is the means by which graduate students with research interests in the domain will pursue those interests. Their graduate committees will be formed primarily from the faculty members teaching the graduate courses as set forth in this proposal. As collaborations grow among faculty supporting course work and graduate committee advising on data science and engineering topics, we expect a string of collaborative and interdisciplinary proposals for external funding to arise on these topics. We anticipate an exciting, productive, and challenging research agenda and projects to emerge. The interdisciplinary nature of the evolving field and the new bridges that are certain to be built among faculty, researchers, students, and industry across Maine make this an important effort in advancing knowledge for all of us.

E. Independent Study and Field Practicums

Standing graduate courses for independent study, independent projects, field experience, and graduate internships already exist. One or more of such courses are affiliated with most of the academic programs affiliated with this proposal whether they are on the Orono campus or elsewhere. In some instances, professors may desire to continue using the course designator and syllabus requirements used already with the independent study or internship courses affiliated with their home faculty units. Although not critical at this juncture, reasons for moving to DSE course designators and more standardized syllabi for such courses may arise over time. If so, *DSE 6xx Data Science and Engineering Project* and *DSE 6xx Data Science and Engineering Internship* may be readily proposed and implemented on the UMaine campus.

F. Impact on Existing Campus Programs

Most graduate faculty members are very interested in working with and teaching graduate students. If classes and advising responsibilities start to become too pressing, we have the option of becoming more selective in the quality and numbers of students we admit. Based on the target student populations submitted in this proposal, we feel the load may be handled by the current involved faculty which is dispersed across numerous academic domains and the program will highly complement our existing and ongoing graduate programs.

G. Program Governance

This program will draw upon an interdisciplinary and multi-campus *Data Science and Engineering Advisory Board* to provide guidance for program oversight over time. This Board will contain at least one representative of each participating UMaine college, each participating campus, and each application domain area. The chair of the Advisory Board

will serve as DSE Program Director and will be selected by the Board from faculty expressing a willingness to serve.

V. Program Resources

A. *Personnel*

Faculty expertise in data science and engineering is distributed across colleges and units. Expertise includes large-scale complex data management, data semantics, high-performance computing, artificial intelligence, sensor technology, human-computer interaction, cybersecurity, statistical analysis of spatial and temporal data, and domain-specific analytics along with policy research in data and information science. University of Maine Faculty participating in course teaching or willing to serve on graduate advisory committees are listed below.

Faculty	**Specialization**	**Department**
Ali Abedi	Wireless Sensor Networks, Coding and Information Theory	Electrical and Computer Engineering
Kate Beard	Geographic Information Science, Spatial Statistics	School of Computing and Information Science
Kathleen Bell	Econometrics	School of Economics
Sudarshan Chawathe	Databases, Data Mining, Algorithms	School of Computing and Information Science
Phil Dickens	Cloud Computing, High Performance Computing	School of Computing and Information Science
Don Hummels	Digital Signal Processing	Electrical and Computer Engineering
Rick Eason	Robotics	Electrical and Computer Engineering
Max Egenhofer	Database Systems, Spatial-temporal Reasoning	School of Computing and Information Science
Keith Evans	Econometrics	School of Economics
Sepideh Ghanavati	Data Privacy and Security	School of Computing and Information Science

Nicholas Giudice	Human Computer Interaction	School of Computing and Information Science
Pushpa Gupta	Statistics	Department of Mathematics and Statistics
Ramesh C. Gupta	Statistics	Department of Mathematics and Statistics
Torsten Hahmann	Data Semantics, Ontologies, Artificial Intelligence	School of Computing and Information Science
Daniel Hayes	Remote Sensing, Image Processing	School of Forest Resources
David Hiebeler	Mathematical Modeling and Simulation	Department of Mathematics and Statistics
Raymond Hintz	Surveying, Photogrammetry	School of Engineering Technology
Shaleen Jain	Engineering Data Analytics	Civil and Environmental Engineering
Jaehong Jeong	Spatial Statistics	Department of Mathematics and Statistics
Nory Jones	Management Information Systems	Maine Business School
Jon Ippolito	New Media	School of Computing and Information Science
Andre Khalil	Computational Biomedicine, Radiomics	Chemical and Biomedical Engineering
Ben King	Bioinformatics	Molecular and Biomedical Science
Anne Knowles	Historical GIS, Geovisualization, and Digital Humanities	History
Yonggong Tim Lu	Business Analytics	Maine Business School
Craig Mason	Biobehavioral Informatics and Quantitative Methods	Education and Applied Quantitative Methods

Brian McGill	Ecoinformatics	School of Biology and Ecology
Cyndy Loftin	Wildlife Modeling, Geographic Information Systems	Dept. of Wildlife, Fisheries, and Conservation Biology
Jonathan Malacarne	Econometrics	School of Economics
Silvia Nittel	Spatial Databases, Geosensor Networks	School of Computing and Information Science
Harlan Onsrud	Data and Information Policy	School of Computing and Information Science
Nigel Pitt	Analytical Number Theory	Mathematics and Statistics
Parinaz Rahimzadeh-Bajgiran	Remote Sensing, GIS	School of Forest Resources
Nimesha Ranasinghe	Multisensory Interfaces, Embedded Systems, Sensors and Actuators	School of Computing and Information Science
Penny Rheingans	Data Visualization, Computing Education	School of Computing and Information Science
Judith Rosenbaum	Media and Society	Communication and Journalism
Andrew Thomas	Oceanography, Ocean Satellite Data	School of Marine Sciences
Roy Turner	Artificial Intelligence	School of Computing and Information Science
Mike Scott	New Media	School of Computing and Information Science
Bruce Segee	High Performance Computing, Instrumentation	Electrical and Computer Engineering
Vince Weaver	High Performance Computing, Performance Evaluation	Electrical and Computer Engineering

Michael Weber	Marketing	Maine Business School
Zheng (David) Wei	Statistics	Department of Mathematics and Statistics
Aaron Weiskettel	Forest modeling	School of Forest Resources
Thomas Wiesen	Econometrics	School of Economics
Manuel Woersdoerfer	Computer/Engineering Ethics, Business Ethics	School of Computing and Information Science
Salimeh Yaseai Sekeh	Machine Learning	School of Computing and Information Science
Terry Yoo	Computer Graphics, Image Analysis	School of Computing and Information Science
Yifeng Zhu	Data Storage, Deep Learning, High Performance Computing, IoT	Electrical and Computer Engineering

Professors from additional UMS campuses invited to potentially serve on graduate committees and/or teaching courses that have been vetted and will be accepted for transfer credits are included in the following table.

Faculty	**Specialization**	**Department**
Matthew Brampton	Geographic Information Science	Muskie School of Public Service, University of Southern Maine
Matthew Dube	Spatial-Temporal Reasoning, Data Visualization, Data Mining, Social Science Applications	Computer Information Systems, University of Maine at Augusta
Muhammad El-Taha	Operations Research	Mathematics and Statistics, University of Southern Maine
Henry Felch	Cybersecurity and Computer Information Systems	Cybersecurity and CIS, University of Maine at Augusta

Bruce MacLeod	Software Systems for Health Applications	Computer Science, University of Southern Maine
Betina Tagle	Cybersecurity and Computer Information Systems	Cybersecurity and CIS, University of Maine at Augusta
James Suleiman	Management Information Systems, Computer Supported Cooperative Work, Text Analytics	USM School of Business
Tora Johnson	Regional Planning Applications of GIS, Natural Resource Decision Support, Participatory GIS	GIS Laboratory, University of Maine at Machias

B. Facilities

Information Infrastructure: Several infrastructure resources already exist to support a strong Data Science and Engineering initiative. The University of Maine has established infrastructure in high-performance networks and computer clusters to support big data research. The Three Ring Binder and the Maine Research and Education network tie together large portions of Maine's network traffic, including network traffic for all K-12 schools and nearly all libraries in the state. This network provides a backbone for efficient data distribution and collection.

Research Labs and Centers: Existing research centers and laboratories provide a wealth of resources that may be leveraged to support this degree program. These labs and centers are the foundation for cutting age results that research-active faculty will bring to their classes and homes for research-active graduate students interested in completing a thesis. Research in UMaine-based labs and centers includes computational modeling, image analysis, spatio-temporal analysis of data from geosensors, agent-based approaches to decision-making for autonomous vehicles, privacy engineering and regulatory compliance, semantic modeling of relationships in spatial data, virtual environments and multimodal interaction, wireless communication, and convergent science.

Classrooms: Classrooms suitable for hybrid and distance classes are available through several units for small classes and through central scheduling for larger classes. These facilities are sufficient for initiation of the proposed programs. A typical distance-equipped classroom will contain two new computers each (one with a touch screen), two cameras each, and ceiling microphones to facilitate discussions among in-person and distant students, as well as capture of class for later viewing. As programs

grow and more courses become available by distance, more distance-equipped classrooms will be needed to meet the demand.

C. *New Equipment, Facilities, and Space*

Based on the conservative number of students to be accepted into the program and due to extensive labs and physical facilities already supporting current graduate programs, no new equipment is required for support of this explicit program in the near future.

The new program staff member will need an office near the DSE program director in order to facilitate close and effective collaboration. Because at least half or more of the MS Data Science students are expected to participate by distance methods, space needed for graduate students in the program is modest. For those research-focused graduate students located on campus, lab space will generally be available through the home department of their research mentor.

D. Library Resources

All enrolled students, whether on-campus or participating at a distance, have access to extensive electronic journals, databases and other resources made available through Fogler Library. Library resources are currently satisfactory for supporting courses and research in Data Science and Engineering, so no additional library resources are currently anticipated. If found insufficient over time, Fogler Library has an ongoing and regular process for requesting new electronic resources and our experience is that library staff are very responsive to research needs. All enrolled tuition-paying distance students have electronic access to the usual UMaine library resources from their homes and offices.

E. Extent of Cooperation with Other Academic Programs

Up to a maximum of nine credits of external graduate courses may be accepted on any graduate student's program of study if approved on the student's official graduate program of study. Courses from other USM campuses that would appear to be appropriate to accept within these parameters are listed in Section IV.B. Currently this includes courses only from USM, UMaine-Augusta, and UMaine-Machias but this may expand over time. Accepting such courses provides great flexibility in that a student living in a community with another USM campus close by that offers an appropriate course may be able to attend that course physically. Further, if comparable or substitute data science courses are offered by distance on another campus during a semester when not offered by distance on the Orono campus, this provides extra flexibility for students pursuing their graduate degrees. External courses listed in Section IV.B. are yet tentative and we envision further acceptable additions and substitutions over time.

VI. Total Financial Consideration

A. Anticipated Costs in the First Five Years

Program Coordinator: Administrative support is critical to help with the management and marketing of these new graduate programs. This staff member will perform a range of specialized management, marketing, web development, web support, assessment, and outreach tasks. Initially, this new program will require a half-time Program Coordinator with a total cost of approximately **$45,000 per year**.

Upgrading of Distance Classroom Facilities: Upgrading of two distance conference style classrooms in order to increase distance capacity would cost approximately **$30,000**. While the current classrooms are operational, the number of offerings and quality of learning experiences for distance graduate students would be substantially enhanced through such upgrades.

Social Media Marketing: A graduate degree like Data Science and Engineering is designed to draw people from many undergraduate degree backgrounds. Most successful graduate distance programs across the nation with broad audiences find social media to be one of the most effective means for identifying candidates for their programs. Programs drawing from such broad audiences typically need very focused social media advertising on their specific program to be successful. That is, people from Maine or elsewhere doing web searches for "online masters in data science" is a key audience to contact which should be pursued through repetitive remarketing using Google, Facebook and similar forums. Such ads also increase the visibility of the on-campus program. General promotion of all University of Maine distance offerings is beneficial but won't typically result in the leads needed to aggressively grow individual graduate programs. Thus, a minimum budget of **$8,000 per year** is needed for social media ads for the MS Data Science and Engineering program. The University of Maine has one of the lowest e-rates for tuition among land-grant, sea-grant universities and this should be heavily marketed. The social media marketing budget needed may be administered by the Division of Lifelong Learning (DLL) or by the DSE Program Director.

DSE Program Director. Program administration will be supported by a stipend to be paid to the DSE Program Director. This Program Director will be a faculty member who takes this leadership role in addition to their normal duties. Initially, this stipend will be $15,000 per year.

DSE Course Instructors. Foundation and required courses with a DSE designator will be supported by funds to the unit providing the course instructor. It is important for the sustainability of this program for these courses to be generally counted in the regular teaching load of the instructor, necessitating support for the unit providing such faculty. Anticipated funds required to enable faculty to teach DSE designated courses are $7500 per course for four courses per year, plus two to three one-credit domain overview courses per year at $2500 each.

Other Costs. Neither Research Assistantship nor Teaching Assistantship funding is being requested to help support graduate students in this program. We expect that students participating at a distance will be self-funded or funded by their employers. We expect on-campus students will either self-fund or apply for assistantships through the normal campus and unit competitions for such funds.

Total Costs: Thus, total estimated increased costs over the current operations for the five-year period would be approximately **$557,500.**

B. Anticipated Income in First Five Years

Student Tuition: Numbers in the table below are based on the following assumptions: (a) the projected enrollment listed in Section III. D. will be achieved, (b) half of the graduate students each year will pay the e-rate for distance students and the other half on-campus will pay Maine in-state graduate tuition, (c) on-campus students will complete on average 15 credits per year (i.e. assumes completion in two years) and distance students will complete on average 9 credits per year, and (d) for rough and conservative estimation purposes the annual tuition and fee rates over the five-year period will be held constant. The results of this revenue computation over five years is as follows.

Year	Total # Students	Campus Students	Distance Students	Annual Campus Credits Per Student	Annual Distance Credits Per Student	Campus Income	Distance Income	Total for Year
2020-21	10	5	5	15	9	$37,850	$29,180	$67,030
2021-22	17	8	9	15	9	$60,560	$52,524	$113,084
2022-23	25	12	13	15	9	$90,840	$75,868	$166,708
2023-24	30	15	15	15	9	$113,550	$93,930	$207,480
2024-25	30	15	15	15	9	$113,550	$93,930	$207,480

						5-Yr TOTAL	$761,782

Notes: Amounts in the above table are based on the following rates and fees:

TUITION	Per Credit Hour	**FEES**		Per Semester	Per Credit
In-State Tuition	$450	**Unified Fee**	< 6 credits	$134	
E-Rate (Distance)	$563		6-11 credits	$410	
			12-15 credits	$1005	
			16+ credits	$1031	
		Online Fee			$25

Example Computations for 2020-2021:
On-Campus: 5 students*[($450 tuition/cr*15cr/yr)+($410 + $410 unified fees)] = $37850
Distance: 5 students*[($563 tuition/cr*9cr/yr)+($134+$410 unified fees)+(9cr*$25 online fees)] = $28,055

C. Anticipated First Year Costs

The first-year costs could be the entirety of that listed under Section VI. A. or a subset. The most critical items to get the program off and running in the first year would be the Program Coordinator ($45,000), the social media marketing costs ($8,000), the Director stipend ($15,000), funds for DSE course instructors ($30,000), and funds for two domain case studies ($2500). A total of $100,500.

D. Revenue Sharing

DSE program seeks to develop a high quality curriculum with faculty involvement across multiple disciplines. The quality and continual development of curricula is an important facet of this program's success, especially in view of the large number of DSE programs at other universities. Thus, we propose revenue sharing as a way to provide adequate resources for the growth and vitality of the DSE program. Numerous universities (for example, University of Massachusetts-Amherst and University of California-San Diego) have developed formal arrangements to affirm their commitment to professional programs. Revenues from program tuition will be used to support the program through distribution to participating units according to enrollments of DSE students in courses,

DSE students advised, and DSE Foundation or Required courses offered. The specific formula for revenue sharing will be developed at a later time.

VII. Program Evaluation

Reviews of the overall graduate program and coursework will be overseen by the Data Science and Engineering Advisory Committee. Teaching evaluations are accomplished online for each course near the end of each semester. Summary results from these courses as well as all other graduate courses involved in the MS program will be requested regularly by the Advisory Committee and reviewed. Advisory Committee members will be encouraged to sit in on classes for observations as needed and as appropriate. If and when needed, corrective actions will be suggested.

Further, the DSE Program Coordinator or designee will be tasked with accomplishing both exit interviews (in person or online) and exit surveys just prior to graduation for each student graduating from the program. This typically occurs just prior to or during final exam week. The Advisory Board will review these further results and discuss and recommend actions as appropriate.

The University of Maine is accredited by the New England Commission of Higher Education (NECHE) which imposes further data collection and assessment requirements (https://www.neche.org/resources/standards-for-accreditation/). Those standards and data collection requirements will be met as part of the ongoing assessment processes of the University. Further, the University of Maine mandates and accomplishes formal internal regular reviews of its units and programs. The Data Science and Engineering graduate programs will be included as well within these regular reviews.

In September 2022, the DSE Advisory Board will compile all of the assessment data gathered in the previous two years, document any actions taken during that time, and document admissions, enrollments, retention, and graduation numbers for the MS program. In consultation with all teaching and student advisor professors involved in the program and with the DSE Program Director, the DSE Advisory Board will accomplish an audit of the program. This report will be delivered to UMaine administrators as well as the UMS Vice Chancellor for Academic Affairs.

References

[[AMSTAT]
https://www.amstat.org/asa/News/New-Report-Highlights-Growing-Demand-for-Data-Science-Analytics-Talent.aspx

[BG 2019] Burning Glass Technologies, https://www.burning-glass.com/. 2019.

[Forbes, 2012]
http://www.forbes.com/sites/siliconangle/2012/02/17/big-data-is-big-market-big-business/

[Manyika et al., 2011] Manyika,J., Chui, M., Brown, B., Bughin,J., Dobbs,R., Roxburgh, C., Hung Byers, A. (2011). Big data: The next frontier for innovation, competition, and productivity. McKinsey Global Institute.

[OSTP, 2012] Big Data Research and Development Initiative, Office of Science and Technology Policy, 2012. Available online at https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/big_data_press_release_final_2.pdf.

[UMaine SEA] UMaine Signature and Emerging Areas of Excellence, https://umaine.edu/areas/data-science-and-engineering/