Engaged Practices Innovation Grant Program Proposal

# Integrating Blended Learning Approaches Into the Rubenstein School Core Curriculum

Faculty Project Lead:

Walter Poleman, Core Curriculum Committee Chair

Staff Lead:

Margaret Burke, Coordinator of Educational Innovation

Faculty Collaborators:

Cecilia Danks, Brendan Fisher, Clare Ginger, Rachelle Gould,

Dave Kaufman, Jeffrey Hughes, & Jed Murdoch

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#### Abstract

The Rubenstein School seeks funding to assist in the development of five online instructional modules for use in achieving learning outcomes in two courses (NR103 and NR104) central to the core curriculum. These modules will support blended learning approaches that have been shown to foster engaged learning. We are requesting \$5,670 to support this important project.

#### Introduction & Background

As technology fundamentally alters the manner in which we communicate and learn, institutions of higher education need to discover the transformative potential of blended learning and stay abreast of changing expectations (Garrison & Kanuka, 2004). Blended learning is described as the combination of face-to-face learning with asynchronous Internet technology (2004). The Engaged Practices Innovation Grant Program provides an opportunity for the Rubenstein School of Environment and Natural Resources (RSENR) to increase student engagement by creating blended teaching materials for two of its core courses, NR103: *Ecology, Ecosystems, and the Environment* and NR104: *Social Processes and the Environment*. To do so, faculty, staff, and campus partners will engage in design, development, and implementation of five distinctive online learning modules that address key content areas. These modules will provide students and faculty with more innovative, efficient, and effective approaches to teaching and learning in the core curriculum.

Strategic introduction of digital modules in the second year experience has been requested and encouraged by faculty and students to 1) enhance effective use of class time, 2) support individualized learning needs in larger class sizes, 3) integrate engaging

online educational approaches, 4) effectively scaffold content, and 5) provide continued access to educational content for future use. NR103 and NR104 are two core courses students take concurrently in their second year in the Rubenstein School. Student and faculty feedback has revealed these courses as target areas for improvement in the core curriculum. Investing in the development of online learning modules will help RSENR move toward its goal of engaged hybrid learning aligned with essential learning outcomes in the core.

#### **Project Description**

#### **Core Revitalization Process**

The core curriculum of the Rubenstein School incorporates a body of knowledge and an array of competencies central to the study of natural resources and the environment (Appendix A). The eight required courses are taken sequentially and cut across all academic programs within the School (Appendix B).

Since 2015, RSENR has been engaging in an ongoing curriculum revitalization process. Facilitated dialogue and systematic data collection have informed changes to content and instruction. As part of the emerging assessment plan, RSENR has completed student feedback sessions, CTL's peer-led focus groups, senior capstone surveys, and experience-mapping events to gather student input. Faculty have participated in curriculum mapping processes, rubric-based assessment design and implementation, and retreats to critically reflect on the scaffolding of the core curriculum. These processes revealed requests to incorporate deliberate blended learning approaches and target content areas for online modules:

# Table 1. Five proposed modules designed to strengthen student learning and

Course	Module Topic	Draft Outcomes	Faculty & Campus/ Community Partners	Issues Addressed
NR 104	Government Basics	<ul> <li>Students will examine basic structures of city, state, and federal government</li> <li>Students will be introduced to Vermont government as it relates to natural resources; Students will take a virtual tour of the Vermont State House</li> </ul>	Faculty: Walter Poleman, Clare Ginger, Cecilia Danks, Rachelle Gould, Dave Kaufman Community Partner: Vermont Agency of Natural Resources (ANR)	<ul> <li>Offers resources for students at different levels through dynamic supplemental materials showcasing Vermont</li> <li>Presents an opportunity to integrate virtual field trips (e.g., the State House in Montpelier) into the core</li> <li>Features interviews and in-class support from partners at ANR</li> </ul>
NR 104	Economics	<ul> <li>Students will apply a basic understanding of economic principles to natural resources topics</li> <li>Students will identify topics specific to environmental and ecological economics</li> <li>Students will apply economic principles to problem sets</li> </ul>	<b>Faculty:</b> Brendan Fisher, Cecilia Danks	Offers differentiated tracks to meet diverse range of introductory and more advanced skills and abilities related to ecological economics

engagement in the Rubenstein School's core curriculum.

NR 104	Critical Reading of Scientific Literature	<ul> <li>Students will examine scientific literature and practice tools for comprehension</li> <li>Students will apply specific reading techniques to journal articles and papers</li> <li>Students will critically analyze and evaluate assumptions</li> </ul>	Faculty: Rachelle Gould Campus Partners: Susanmarie Harrington, Laurie Kutner	<ul> <li>Builds upon on content introduced in the NR1/first year</li> <li>Efficiently responds to student-identified challenges in reading scientific literature</li> <li>Includes additional resources and in-class support from campus information literacy experts, Susanmarie Harrington and Laurie Kutner</li> </ul>
NR 103	Citing Sources: Practical, Ethical, and Rhetorical Approaches	<ul> <li>Students will demonstrate skillful use of high quality, credible, relevant sources to develop ideas that are appropriate for the discipline<sup>1</sup> (Rhodes, 2009)</li> <li>Students will examine the concept of intellectual property and the role of appropriation as it relates to ideas and knowledge</li> </ul>	Faculty: Walter Poleman, Jed Murdoch Campus Partners: Susanmarie Harrington, Laurie Kutner	<ul> <li>Features videos and resources for online instruction and would</li> <li>Includes resources and in-class support from campus information literacy experts, Susanmarie Harrington and Laurie Kutner</li> <li>Explicitly addresses academic integrity and professional practices identified by faculty</li> </ul>
NR 103	Excel	<ul> <li>Students will be able to apply Excel functions appropriately in simulations specific to natural resources application</li> <li>Students will be able to convert relevant information into appropriate graphical and quantitative formats<sup>2</sup> (Rhodes, 2009)</li> </ul>	<b>Faculty:</b> Jed Murdoch Walter Poleman	<ul> <li>Offers differentiated additional resources for students with a diverse range of pre-existing knowledge by offering dynamic supplemental material</li> <li>Includes various problem sets and activities</li> <li>Provides option of testing out if students' skills meet the levels required for the course</li> </ul>

<sup>&</sup>lt;sup>1</sup> Adapted from AAC&U Written Communication VALUE Rubric <sup>2</sup> Adapted from AAC&U Quantitative Literacy VALUE Rubric

## Intended Impacts in the Context of Current Literature

RSENR believes that implementing online learning modules in the core will:

- 1. Enhance the effective use of class time. With flipped learning, "direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter" (Definition of flipped learning, 2014). With online modules, core instructors will be able to provide instruction in the topic areas using online approaches and thereby utilize class time to apply more engaged learning through discussion, activities, and other reinforcing approaches.
- Support individualized learning needs in larger class sizes. Blended approaches are shown to be effective in engaging students' unique needs and varied learning styles. Digital learning modules invite students to, "(1) visualize difficult and naturally dynamic concepts, (2) promote active learning, problemsolving, and critical thinking with interactive simulations and virtual environments, (3) interact with the content with self-quizzes, and (4) access content anytime, anywhere, at any pace" (Huang, 2005). Students who need supplemental materials and additional practice time will be able to access designated resources and exercises. Students who have a more advanced knowledge in these topic areas will have the option of moving more quickly through the module materials.
- Integrate engaging online educational approaches. Strategic use of video and problem-based learning has been shown to increase student participation:
   "Students who received a video assignment were both more likely to attend class

and to rate their assignment as providing a higher degree of satisfaction, compared to students who received a textbook assignment" (Stockwell, et al., 2015). RSENR seeks to utilize video, problem sets, and additional digital approaches listed above to enhance the overall level of engagement in NR103 and NR104.

- 4. Effectively scaffold content. Through Intensive curricular mapping efforts, RSENR has been strengthening strategic scaffolding of content in the core. Due to the continual rotation of faculty teaching in the core, consistent scaffolding has been a challenge. Implementing learning modules will anchor components of steady instruction in specified topic areas, thereby supporting scaffolded learning and instruction.
- 5. Provide continued access to educational content for future use. Core instructors will have shared access to these modules. While they will be anchored in specific courses, succeeding courses will build upon them. Faculty teaching upper level core courses will be able to review and provide students with Blackboard access to these modules in subsequent core courses as needed.

Increasing innovative pedagogical approaches in the second year will offer students additional support as they experience increasing rigor and complexity in the core. Overall, by introducing these online modules, RSENR aspires to enhance the second year experience and thereby enhance retention.

#### Assessment Plan

Formative assessment processes will accompany this initiative. The following proposed assessment approaches can be easily implemented by course instructors and will lead to data that can be analyzed to illuminate trends over time.

#### Direct Assessment

*Embedded Quizzes* - In each of the modules, students will find a quiz including performance exercises where they will demonstrate their understanding of the content provided. Quiz results can be aggregated to provide input regarding efficacy of modules.

#### Indirect Assessment

*Quiz Questions* - Each module quiz will incorporate two consistent questions asking, 1) if students utilized the module in its entirety and, 2) if students found this approach to be effective in supporting their learning.

*"Track Number of Views"* - In Blackboard's standard options, instructors will be asked to select the "Track Number of Views" setting. Data on the number of views will be collected to inform if students are accessing the provided materials.

*Faculty Observations* - After the Fall 2017 implementation, faculty will discuss the integration of modules at the 2017 December Curriculum Symposium.

#### Project Sustainability

This launch of five online modules will engage nine faculty members in the design and implementation of blended learning in the core. Faculty involvement in this initial process will provide foundational learning and thereby enhance school-wide capacity to continue adding, delivering, and refining modules over time.

In December 2017, the RSENR associate dean, core curriculum committee, coordinator of educational innovation, and NR103/NR104 instructors will review data collected and determine how to refine and revise the modules. This process will be repeated in succeeding semesters. In spring 2018, the core curriculum committee will also use these

data to determine the feasibility of creating one or two additional modules during the 2018-2019 academic year and expanding the use of blended learning in the core.

Furthermore, the long-term utility of online learning modules in the core has been clearly demonstrated in NR1 over the past 3 years. RSENR partnered with the Center for Teaching and Learning to develop an online module featuring tree identification. Using a set of short videos, students learn to identify 20 common trees and then utilize labs to practice this skill in the field. These 3-year old videos remain highly relevant and are integral components of a hybrid learning experience that has become a hallmark of the course. While feedback loops to support ongoing refinement of proposed modules are central to this project, RSENR also anticipates that videos developed for NR103/104 will have a long shelf life.

# Works Cited

Definition of flipped learning. (2014). *Flipped Learning Network*. Retrieved from <a href="http://flippedlearning.org/definition-of-flipped-learning/">http://flippedlearning.org/definition-of-flipped-learning/</a>

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The internet and higher education*, 7(2), 95-105.

Huang, C. (2005). Designing high-quality interactive multimedia learning modules. *Computerized Medical Imaging and Graphics*, *29*, 223-233.

Rhodes, T.L. (2009) Assessing outcomes and improving achievement: Tips and tools for using rubrics. Washington, DC: AAC&U.

Stockwell, B. R., Stockwell, M. S., Cennamo, M., & Jiang, E. (2015). Blended learning improves science education. *Cell*, *162*(5), 933-936.

Suttle, R. (2016). What is the average pay for a freelance video editor. Retrieved from Hearst Newspapers, LLC website: <u>http://work.chron.com/average-pay-</u>freelance-video-editor-19801.html

# Project Timeline & Budget

Date	Task	Stakeholders	Cost
May 2017	<ol> <li>Harvest resources from previous iterations of NR103 and NR104 and other courses</li> <li>Outline five scaffolded learning modules</li> <li>Collaborate with the Center for Teaching and Learning, UVM FWIL/WID faculty</li> <li>Storyboard &amp; draft scripts for video lectures and digital content delivery</li> </ol>	Margaret Burke, Walter Poleman, Cecilia Danks, Brendan Fisher, Clare Ginger, Rachelle Gould, Dave Kaufman, Jeffrey Hughes, Jed Murdoch Wendy Verrei- Berenback, Susanmarie Harrington, Laurie Kutner	Cost-share
June 2017	<ol> <li>Strategic curating of resources</li> <li>Recording of audio/video</li> <li>Design of quizzes</li> </ol>	Margaret Burke, Walter Poleman, Cecilia Danks, Brendan Fisher, Clare Ginger, Rachelle Gould, Dave Kaufman, Jeffrey Hughes, & Jed Murdoch	Faculty per diem rate = \$250 <b>15 faculty days x</b> <b>\$250 = \$3,750</b> Video editing consultant \$30/hour x 5 8-hour days = <b>\$1,200</b>
July 2017	<ol> <li>Fine tuning modules</li> <li>Video/audio editing</li> <li>Submit videos for captioning</li> </ol>	Margaret Burke, Walter Poleman, Cecilia Danks, Brendan Fisher, Clare Ginger, Rachelle Gould, Dave Kaufman, Jeffrey Hughes, & Jed Murdoch	Videography \$30/hr x 24 hours = <b>\$720</b> Total = \$5,670
August 2017	Mid-August core curriculum meeting	All core faculty, core curriculum committee, administrators, coordinator of educational innovation	Cost-share
Fall semester 2017	Launch modules in the core and support assessment approaches	Participating faculty, campus partners (CTL/WID), coordinator of educational	Cost-share

		innovation <sup>3</sup>	
December 2017	2 <sup>nd</sup> Annual Core Curriculum Symposium	All core faculty, core curriculum committee, associate dean, campus partners (CTL/WID)	Cost-share
Spring semester 2018	Refine and update resources based on feedback and implement second semester of module use	Participating faculty, campus partners (CTL/WID), coordinator of educational innovation	Cost-share
Summer 2018	Review data collected, revise for Fall 2017	Participating faculty, campus partners (CTL/WID), coordinator of educational innovation	Cost-share
TOTAL REG	\$5,670		

<sup>3</sup> Current RSENR Coordinator of Educational Innovation (CEI), Margaret Burke, will be leaving her full time role in May 2017. She will continue providing remote and on-site support part-time throughout Fall 2017. The succeeding CEI will support the continued efforts on this project and provide pedagogical and assessment support within the school.

# Appendix A:

# **Core Learning Outcomes**

### Core Competencies:

- **CLO1 Communication:** Students will be able to employ effective speaking, writing, listening, and digital communication techniques.
- **CLO2 Teamwork:** Students will be able to contribute to collaborative efforts, facilitate contributions of others, and address conflict directly and constructively.
- **CLO3 Working across Difference**: Students will be able to critically examine dimensions of difference and apply a sophisticated understanding of power and privilege to their lives and work.
- **CLO4 Problem Solving:** Students will be able to design, evaluate, and employ appropriate frameworks in order to effect change and generate collaborative solutions to complex problems.
- **CLO5 Inquiry & Analysis:** Students will be able to apply critical thinking skills and employ qualitative and quantitative methodologies in order to formulate questions and evaluate core knowledge areas.
- CLO6 Integrative Learning: Students will be able to synthesize and transfer learning to complex situations across disciplinary boundaries through the application of critical reflection skills.

### Core Knowledge Areas:

- CLO7 Ecological Processes & Systems: Students will be able to identify and describe basic ecological processes and systems.
- CLO8 Social Processes & Systems: Students will be able to identify, interpret, and analyze cultural, economic, historical, and political dynamics of environmental issues
- CLO9 Planning & Management: Students will be able to describe effective strategies in ecological planning, management, stewardship, and conservation of natural resources.
- **CLO10 Sustainability:** Students will be able to discuss social, economic, and ecological principles of sustainability.

# Appendix B

Core Curriculum Map: Core Knowledge Areas																					
Core Knowledge Area Learning Outcomes         7. Ecological Processes & Systems				8. Social Processes & Systems					9. Planning & Management					10. Sustainability							
Learning Objectives	A. Principles of Ecology	B. Natural History	C. Aquatic & Terrestrial ecosystems	D. Spatial and temporal scales	A. Culture	B. Economics	C. Governance & Policy	D. Social Justice	E. Environmental History	A. Integrated Planning	B. Natural resource utilization	C. Recreation	D. Conservation	E. Adaptive management	A. Systems thinking	B. Ecological design	C. Ecological economics	D. Equity	E. Social-ecological systems		
NR 1 - Natural History & Field Ecology	$\bullet$	•	٠	$\bullet$					٠	٠	٠	lacksquare	٠		٠	٠			٠		
NR 2 - Nature and Culture					$\bullet$	$\bullet$			•				ullet		ullet		ullet		٠	Voor 1	
NR 3 - Social-Ecological Systems	$\bullet$		٠	$\bullet$	$\bullet$				•		٠		ullet		$\bullet$				٠	Year I	
NR 6 - Race and Culture in Natural Resources					$\bullet$			ullet							$\bullet$			٠			
NR 103 - Ecology, Ecosystems, and the											$\bullet$				igodot					Voor 2 2	
NR 104 - Social Processes and the Environment					$\bullet$	$\bullet$	$\bullet$	$\bullet$									٠		$\bullet$	fedi 2-5	
NR 205 - Integrating Science, Society, and Policy	•								•	•		$\bullet$			$\bullet$		•				
NR 206 - Environmental Problem Solving and Impact				•						•		$\bullet$			•	•			•	Year 4	
NR 207 - Power, Privilege, and the Environment					•			•										•			
Core Knowledge Area Learning Outcome Statements	Students will be able to identify and describe basic ecological processes and systems.				Students will be able to identify, interpret, and analyze cultural, economic, historical, and political dynamics of environmental issues.					Students will be able to describe effective strategies in ecological planning, management, stewardship, and conservation of natural resources.					Students will be able to discuss social, economic, and ecological principles of sustainability.						
Levels of Instruction Level of Learning																					

1 ( Exposure 2 ( Emphasis

# Exposure

Building Capacity

- 3 Capstone
- Literacy

Core Competency Learning Outcomes	1. Communication				2. Teamwork			3. Working across Difference				4. Problem Solving			5. Inqu	uiry & A	nalysis	6. Integ	rative L	earning	
Learning Objectives	A. Written	B. Oral	C. Digital Media	D. Listening	A. Contribution	B. Facilitation	C. Constructive Climate	Identity Development	A. Intercultural Competence	B. Power and Privilege	D. Engaging with Tension	A. Problem solving tools and frameworks	B. Catalyzing Change	C. Leveraging Resources	A. Scientific Inquiry	B. Critical Thinking	C. Information & Quantative Literacy	A. Transdisciplinarity	B. Knowledge Transfer	C. Connection to Experience	
NR 1 - Natural History & Field Ecology	$\bullet$		$\bullet$		$\bullet$				$\bullet$				٠		$\bullet$	$\bullet$	٠			٠	
NR 2 - Nature and Culture	٠		٠		٠				$\bullet$	٠			٠			$\bullet$	$\bullet$	٠	$\bullet$	٠	Voor 1
NR 3 - Social-Ecological Systems	٠		$\bullet$		٠				$\bullet$	٠						$\bullet$	$\bullet$		$\bullet$	٠	Year 1
NR 6 - Race and Culture in Natural Resources		$\bullet$		٠			●	$\bullet$	$\bullet$	٠	$\bullet$		٠	٠		$\bullet$			●	$\bullet$	
NR 103 - Ecology, Ecosystems, and the		ightarrow	$\bullet$		$\bullet$	$\bullet$	igodot					$\bullet$	٠	٠	$\bullet$		$\bullet$	igodot			Voar 2-3
NR 104 - Social Processes and the Environment	ightarrow		$\bullet$				●	$\bullet$		lacksquare		$\bullet$	$\bullet$	٠		$\bullet$					Teal 2-5
NR 205 - Integrating Science, Society, and Policy	•															$\bullet$	$\bullet$	$\bullet$	$\bullet$		
NR 206 - Environmental Problem Solving and Impact	•	$\bullet$			•		•				•	•	•	•		•			•	•	Year 4
NR 207 - Power, Privilege, and the Environment		$\bullet$					$\bullet$			lacksquare			•	•						•	
Core Competency Learning Outcome Statements	Stuc emplo writing comm	lents wi by effec g, listeni unicatic	ill be ab tive spe ing, and on techr	le to eaking, I digital niques.	Studer to c collabo f cont others conflic con	nts will b ontribut orative e facilitate tribution s, and a ct direct ostructiv	be able te to efforts, e ns of ddress ddress ly and ely.	Stuc critical of di nuan power effec	dents wi ly exami fference ced und r and pri tive con	II be ab ne dim and ap erstand vilege t nmunica	le to ensions pply a ling of hrough ation.	Students will be able to design, evaluate, and employ appropriate frameworks in order to effect change and generate collaborative solutions to complex problems.			Studer to a think emplo and meth order que eva knov	nts will I pply cri ing skill oy quali quantit nodolog to forn estions aluate c vledge a	be able tical s and tative ative ies in hulate and ore areas.	Studer to sy transf comp acros bounc the a critic	nts will I nthesize er learr lex situe s discip laries th pplicati cal refle skills.	be able e and ing to ations linary urough on of ction	

# **Core Curriculum Map: Core Competencies**

Levels of Instruction

1 🕒 Exposure

2 🛈 Emphasis

3 Capstone



Dear Associate Provost Reed and Student Success and Satisfaction Committee,

I am pleased to write in support of the proposal, *Integrating Blended Learning Approaches into the Rubenstein School Core Curriculum*, submitted as part of your call for proposals for the Engaged Practices Innovation Grant program. This proposed project, led by Margaret Burke, Walter Poleman, and 7 faculty collaborators, is for support to develop, design, and implement five blended learning modules into two sophomore year courses in the Rubenstein School core curriculum.

Faculty in RSENR have been involved in a three-year core curriculum revitalization process which has led to a retooling of the learning outcomes for the core curriculum as a whole, as well as mapping learning outcomes across individual core courses. This process has illuminated areas where we can strengthen our delivery of knowledge areas and competencies within the core and create a strong foundation on which to build content for our six majors.

This proposal is to design and implement five blended learning modules that will provide an exemplar for how we scaffold content and competencies in the core curriculum to enhance student learning and deliver key knowledge areas within the core. The use of these modules will address challenges we are facing with differential student learning at the start of the sophomore year, where students more aligned with natural vs. social science majors are beginning to develop more specialized knowledge bases. As such, some students have built capacity in these content areas while others have not. At the same time, we know that these competencies are critical to overall student success and need to be addressed directly and early in the core curriculum. The blended learning will create asynchronous opportunities for students to engage more deeply in this content.

The Rubenstein School is uniquely positioned for this work due to its heavy focus on experiential learning and engaged learning pedagogy. This team of collaborators is well-prepared to lead this initiative due to their innovative teaching experience and active engagement in the core curriculum. The blended learning approach in the second year of the Rubenstein core curriculum will provide a framework that we can incorporate into other core classes, as well as in our majors, to better provide a scaffolded learning experience for our students.

Please feel free to contact me if you have any questions (<u>astrong@uvm.edu</u>; 802-656-2910).

Sincerely,

Allen M. Sory

Allan Strong Associate Dean Associate Professor