

Curricular Affairs Committee of the Faculty Senate

To: The UVM Faculty Senate

From: Curricular Affairs Committee of the Faculty Senate, Laura Almstead, Chair

Date: December 5, 2019

Re: Approval of a proposal for a new Minor in Biosecurity submitted by the College of Agriculture and Life Sciences

At its meeting on December 5, 2019, the Curricular Affairs Committee approved the actions recommended in the following memo.

The Curricular Affairs Committee approved a proposal for a new Minor in Biosecurity from the College of Agriculture and Life Sciences (CALC) with collaboration from the Department of Computer Science in the College of Engineering and Mathematical Sciences (CEMS) and the Department of Political Science in the College of Arts and Sciences. If approved by the Faculty Senate and Board of Trustees, the minor will be offered beginning fall 2020.

Program Description, Rationale, and Justification

The proposed minor in Biosecurity allows students to formalize a grouping of courses from STEM disciplines, including agriculture, as well as social science with a focus on biosecurity. Topics covered in the minor include bioterror threats, prevention, and resilience in our lived, built, and natural environments. The general learning objectives for the minor include: 1) to think critically about biohazards and what to do about them, 2) to understand how communities reduce vulnerability to bio and agroterrorism and to cope with the consequences of such events, 3) to engage in problem solving, 4) to be exposed to a rich variety of perspectives and ideas from across disciplines involved in biosecurity, and 5) to be able to effectively communicate with stakeholders about biosecurity and bioterrorism.

Increased technical capabilities combined with the rapid expansion of the global biotechnology industry have led to heightened concern of bioterrorism. These factors have broadened the availability of materials, technologies, and expertise needed to produce biological weapons, and simultaneously lowered the barriers to executing bioterrorism. In particular, the global food supply is a potential target. Put in positive terms, biosecurity is the opposite of bioterrorism and not only includes the study of threats, but the systems necessary to prevent those threats or reinforce resiliency to those threats.

Evidence for Demand

There is a growing need for graduates to have some coursework in the areas of biosecurity, including areas of bioterrorism, agroterrorism and related aspects such as communication and policy. Enrollments in courses currently offered at UVM that are part of the minor (see Curriculum section below) indicate student interest in this area. Students completing the proposed minor in Biosecurity would be better prepared to enter careers ranging from emergency management to agriculture.

Curriculum

Completion of the minor will require a minimum of 17 credit hours comprised of four core required courses (11 credits) plus at least six credits chosen from a set of elective courses (see table below). The three new courses included in minor (MMG 002:SU, ASCI 007, and PSS 133) have been approved up to the level of the Provost's Office in Courseleaf. Other relevant, advisor-approved courses will be allowed to count for elective credit. Although there are no specific prerequisite courses, some of the upper-level elective courses have prerequisites that are not part of the minor. Some of the required courses also serve as prerequisites for the upper-level electives: CDAE 032 fulfills the prerequisite requirement for CDAE 141 while MMG 002 fulfills the prerequisite requirement for MMG 101. Additional prerequisite courses are noted in the table where applicable.

Required Courses (11 credits total)		Credits
MMG 002:SU*	Unseen Worlds: Microbes and You	3
ASCI 007*	ABCs of Biosecurity	3
CDAE 032	Protect Your Privacy	2
PSS 133*	Agroterrorism and BioPiracy (<i>prereq MMG 002, ASCI 0xx, CDAE 0xx, BIOL 001, or BCOR 011</i>)	3
Elective Courses (minimum of 6 credits; must be chosen from at least two different departments)		Credits
CS 006** or CS 116	Exploring Cybersecurity Cybersecurity Principles (<i>prereqs CS 006 and CS 021</i>)	3
ASCI 117	Animal Plagues and Global Health (<i>prereq BIOL 001/002 or BCOR 011/012</i>)	3
FS 103/NFS 114	Human Health in the Food System (<i>prereq NFS 043 or NFS 073</i>)	3
NFS 254	Global Food Safety (<i>prereq NFS 113</i>)	3
MMG 101	Microbiology and Infectious Disease (<i>co/prereq one semester biology or chemistry</i>)	3
MMG 235	Bioterrorism (<i>prereq MMG 101 or MMG 002 plus PSS 133</i>)	3
CDAE 141	Crisis Communication (<i>prereq CDAE 024, CDAE 032, CDAE 128, ASCI 007, or PSS 133</i>)	3
CDAE 260	Smart Resilient Communities (<i>prereq CDAE 102</i>)	3
POLS 051** or POLS 071**	Intro to International Relations Comparative Political Systems	3
POLS 150	International Security (<i>prereq POLS 051</i>)	3
POLS 157	International Politics of the Middle East (<i>prereq POLS 051</i>)	3
POLS 162	Terrorism and Counterterrorism (<i>prereq POLS 051</i>)	3
POLS 174	Latin American Politics (<i>prereq POLS 071, HIS 063, SPAN 145, or SPAN 146</i>)	3

*new course

**Students that select CS 006, POLS 051, or POLS 071 will need to take an additional elective course to ensure that they meet the standards for a minor, which is a minimum of nine credits at the 100-level.

The proposed minor will be available to all majors across the University, however students in the minor may only count up to two core or elective courses toward this minor and any other major or minor.

Advising and Assessment

All CALS departments that offer one of the required courses for the proposed minor will designate a faculty to act as an advisor for the minor. A committee of participating CALS faculty will meet at least once a year to discuss requirements, successes, and improvements to the minor. Representatives will be appointed to the committee by their Chair and serve on the committee for two to three years.

Staffing Plan, Resource Requirements, and Budget

No additional resources are necessary. The three new courses can be taught by existing faculty within their workloads and, as noted above, there is additional capacity in the existing courses that are part of the minor.

Relationship to Existing Programs and Anticipated Impact on Existing Programs

The most similar programs at UVM are the Computer Science minor with a focus in the area of cybersecurity and the Cybersecurity Certificate offered by the Computer Science Department in CEMS. The Computer Science Department and Dean of CEMS provided letters in support of the proposed Biosecurity minor that indicated little overlap between the programs, and computer science courses are included in the electives for the proposed minor. As noted in the Curriculum section, students will only be able to count two courses towards the proposed minor and any other major or minor.

Based on a survey of other institutions conducted by the proposers, coursework in the area of biosecurity is primarily found in at the graduate level in the fields of public health and biological/biomedical sciences. The proposers indicated that they were not able to identify an undergraduate major or minor in biosecurity or agroterrorism at a degree-granting institution in the US.

While the proposers anticipate a minor in Biosecurity will be of interest to many students in the STEM disciplines, they do not expect the new minor to significantly affect any particular existing program at UVM. Based on a survey of enrollments in existing courses, the proposers indicated that there is room for an additional ~10% enrollment in the existing courses that are part of the minor.

Evidence of Support

Letters of support were received from the individuals below. The proposed minor was also approved by the CALS curriculum committee and the CALS faculty.

- Chair of Computer Science, Christian Skalka
- Dean of CEMS, Linda Schadler
- Dean of CALS, Jean Harvey

Summary

The proposed Minor in Biosecurity allows students to develop focused knowledge in an emerging area of need. There appear to be few undergraduate programs with this focus (particularly agroterrorism) at other institutions, and there are no similar programs at UVM. It is anticipated that the proposed minor will be of interest to majors across campus, primarily in the STEM disciplines.