Proposal for a new Major in Ecological Restoration

To: CALS Undergraduate Curriculum Committee, Commission on Undergraduate Studies and Policies, University Council, University Curriculum Committee

From: Benjamin Tracy, Associate Director Undergraduate Programs, School of Plant and Environmental Sciences.

Date: February 26, 2020

The School of Plant and Environmental Sciences (SPES) with the cooperation of the College of Agriculture and Life Sciences is proposing a new major: Ecological Restoration. The new major will be housed under the BS degree in Environmental Science.

Need for new major:

Ecological Restoration (ER) is the process of guiding the recovery of degraded or destroyed ecosystems like those often found in agricultural, urban, and mined landscapes and associated waters. Restoration enhances a variety of ecosystem services that includes regulating services (e.g., crop pollination, water quality, and mitigating climate change), supporting services (e.g., productivity and biodiversity), provisioning services (e.g. food production), and cultural services (e.g. aesthetics and connecting with nature). To accomplish this, restoration draws on many fields but most heavily on plant sciences, soil science, water science, biology, and ecology, as well as applied economics, statistics, design, social sciences, and policy. Many students have a keen interest in Ecological Restoration, which is a growing field with new job opportunities. The U.S. restoration economy directly employs >126,000 people and generates >$9.5 billion USD annually. Globally, millions of square kilometers are slated for restoration in the next decade. Governments and corporations are increasingly hiring restoration ecologists to meet regulatory obligations and the expectations of investors. The United Nations has designated 2021-2030 as the "Decade on Ecosystem Restoration." To be successful in the restoration economy, graduates need intensive training in the science and practice of restoration with disciplinary knowledge in plant, water, and soil sciences, as well as interdisciplinary knowledge of economics, policy, and human dimensions. Thus, the new major fills a critical need for more graduates with knowledge and training in the science and practice of ecosystem recovery.

The School of Plant and Environmental Sciences (SPES) is well positioned to administer the Ecological Restoration major. Our School will use its strengths in plant science, horticulture, and soil science to train students to restore ecosystems and enhance ecosystem services with emphasis on land uses such as mined lands, mitigation wetlands, and retired agricultural lands. Faculty within SPES have long history of working in land reclamation, plant propagation, plant ecology, soil science, and wetland management, which form the core of the new major. Faculty in our School also conduct research in agricultural systems. Almost 2/3 of the earth's land is devoted to agricultural production, and it is a significant cause of land degradation. Ecological principles can be applied to the restoration of degraded or marginal agricultural land to improve crop production and ecosystem functioning. We believe housing the Ecological Restoration major in our School provides a unique opportunity to

expose agriculture-oriented students to ecological restoration principles, and show them how these principles can be applied to sustain viable crop production on formerly degraded landscapes.

The School also recently filled a tenure track position in Ecological Restoration, and this person is developing both theoretical and applied foundational courses for the major. Additionally, we will tap into the valuable expertise available within several other departments on campus to round out our curriculum. Overall, the Ecological Restoration major effectively bridges SPES's expertise in plant and soil science to provide students with a solid foundation in this field.

Program Requirements:

Students in the Ecological Restoration major will engage in a structured program of learning that moves from introductory courses in the biological and physical sciences to intermediate courses in soil science, ecology, geology, plant science and ecological restoration. The resulting curriculum accommodates both in-class and field-based learning and was designed in conjunction with the Society for Ecological Restoration's Certified Ecological Restoration Practitioner In-Training program (CERPIT), so that graduates will complete their degrees with a professional certification from the leading international organization in the field.

The core requirements for the Environmental Science degree consist of courses in Biology, Soils, Environmental Science, Statistics and Geology. These courses will provide students with a solid foundation for intermediate courses related to ecological restoration. For upper-division coursework, students will delve into more specific ecological restoration courses involving topics such as Reclamation of Drastically Disturbed Lands, Invasive Species, and Plant Taxonomy. Restricted electives include flexible choices related to advanced ecological topics, human dimensions of ecological restoration (e.g., Environmental Law), and plant and soil sciences (e.g., Plant Propagation, Soil Microbiology).

Besides fulfilling Pathways to General Education requirements, the new major will require a minimum of 72 credits of School or School-related courses as follows:

Pathways to General Education (44-47 credits)

1. Discourse

___ (3, foundational) ENGL 1105: First-Year Writing
___ (3, foundational) ENGL 1106: First-Year Writing
___ (3, advanced/applied)

2. Critical Thinking in the Humanities

___ (3) _____
___ (3) _____

3. Reasoning in the Social Sciences

___ (3) AAEC 1005: Economics of the Food and Fiber System
or ECON 2005: Principles of Economics
___ (3) _____

4. Reasoning in the Natural Sciences

___ (3) CHEM 1035: General Chemistry
___ (1) CHEM 1045: General Chemistry Laboratory
___ (3) CHEM 1036: General Chemistry
___ (1) CHEM 1046: General Chemistry Laboratory

5. Quantitative and Computational Thinking

___ (3, foundational) - MATH 1025: Elementary Calculus

__ (3, foundational) - MATH 1026: Elementary Calculus
__ (3, advanced) - STAT 3615: Biological Statistics

6. Critique and Practice in Design and the Arts

__ (3, design) _____
__ (3, arts) _____

7. Critical Analysis of Identity and Equity in the United States

(may be double-counted with another core concept)
__ (3) _____

Common Degree Core Requirements (21 credits)

__ ALS 1234 (1) CALS First Year Seminar
__ BIOL 1105 (3) Principles of Biology
__ BIOL 1106 (3) Principles of Biology
__ CSES/ENSC 3114
or GEOS 3614 (3) Soils
__ CSES/ENSC 3124
or GEOS 3624 (1) Soils Laboratory
__ ENSC 3604 (3) Fundamentals of Environmental Science
__ GEOG 2084 (3) Principles of GIS
or GEOG 4354 (3) Introduction to Remote Sensing
or FREC 4114 (3) Informational Technologies for Natural Resources Management
__ GEOS 1004 (3) Introduction to Earth Science
or GEOS 2104 (3) Elements of Geology
__ ENSC 4864 (1) Environmental Science Capstone

Major Requirements for Ecological Restoration (21 credits)

__ BIOL/HORT 2304 (3) Plant Biology
__ BIOL 2804 (3) Ecology
__ BIOL 3204 (3) Plant Taxonomy
__ ENSC 3244 (3) Ecological Restoration
__ CSES/ENSC 3644 (3) Plant Materials for Environmental Restoration
__ CSES/ENSC 4774 (3) Reclamation of Disturbed Lands
__ PPWS 4604 (3) Biological Invasions

Plant and Soil Sciences Restricted Electives (choose 6 credits)

__HORT 2244 (3) Plant Propagation
__HORT 4064 (3) Soil Microbiology
__HORT 3324 (3) Herbaceous Landscape Plants
__CSES 4174 (3) Soil Evaluation and Sampling
__CSES 4214 (3) Soil Fertility and Management
__CSES/ENSC 4854 (3) Wetland Soils and Mitigation

Ecology Restricted Electives (choose 9 credits)

__ ALS 3404 (3) Ecological Agriculture
__ BIOL 4004 (4) Freshwater Ecology
__ BIOL 4114 (3) Global Change Ecology
__ CSES/FREC 4334 (3) Agroforestry
__ CSES/FREC 4764 (3) Bioremediation

__ CSES 4554 (3) Forage Crop Ecology
__HORT/FREC 2134 (3) Plants & Greenspaces for Urban Communities

Human Dimensions Restricted Elective (choose 3 credits)

__AAEC 3314 (3) Environmental Law
__AAEC 3324 (3) Environmental and Sustainable Development Economics
__ALCE 4304 (3) Community Education and Development
__UAP/PSCI 3344 (3) Global Environmental Issues: Interdisciplinary Perspectives
__UAP 3354 (3) Introduction to Environmental Policy and Planning
__UAP 4344 (3) Law of Critical Environmental Areas

Restricted Electives (choose 12 credits)

__BIOL 2504 (3) Zoology
__ENSC/CSES/BIOL 4164 (3) Environmental Microbiology
__ENSC/CSES 3614 (3) Soil Physical and Hydrological Properties
__ ENSC/CSES/CHEM 4734 (3) Environmental Soil Chemistry
__ENSC 4414 (2) Monitoring and Analysis of the Environment
__ ENSC/CSES 4314 (3) Water Quality
__FIW 2314 (3) Wildlife Biology
__FIW 2324 (3) Wildlife Field Biology
__FIW 4534 (3) Ecology and Management of Wetlands
__FIW 4114 (3) Biodiversity Conservation
__ GEOG/WATR 2004 (3) Introduction to Water Research and Environmental Issues
__GEOG 3104 (3) Environmental Problems, Population, and Development
__ GEOG/GEOS 4084 (3) Modeling with GIS
__GEOG 4314 (3) Spatial Analysis in GIS
__HORT 2134 (3) Plants and Greenspaces in Urban Communities
__HORT 3325 (3) Woody Landscape Plants I
__HORT 3326 (3) Woody Landscape Plants II
__UAP 4374 (3) Land Use and Environment: Planning and Policy

Whom program will serve:

Currently, the School of Plant and Environmental Sciences offers an Environmental Science degree with an Environmental Science major. The Environmental Science major has averaged close to 160 students in recent years. The proposed Ecological Restoration major also will be housed under the Environmental Science degree. Because of the new major, we predict enrollment in the Environmental Science degree will increase from approximately 160 to 190 students after five years.

The U.S. Bureau of Labor Statistics projects 11% growth from 2014 to 2024 for environmental scientists, faster than the average for all occupations. This includes Environmental Restoration Planners. Market demand for plant scientists and related professionals is projected to have sustained 15% growth to 2020 and beyond (U.S. Department of Labor). The STEM Food and Ag Council (2014)

indicates that such a steady need for industry professionals is outpacing the supply of trained graduates.

The major employment sector for Ecological Restoration graduates likely will be scientific and technical consulting services. Examples currently listed in job announcements advertised by the Society for Ecological Restoration include: Ecological Restoration Technician/Specialist, Restoration Project Manager, Environmental Consultant, Wetlands Scientist, Wetland and Stream Restoration Ecologist, and Environmental Science Teacher. Having the curriculum described above as a base, we believe students graduating with a major in Ecological Restoration will be very marketable for such posotions. Graduates also will find work in state or local governments providing conservation advice and services for areas of protected land such as state or city parks. Graduates may also work in local disaster and accident relief to ensure that the integrity of state owned or managed land is maintained. The last employment sector is the Federal government where graduates may work for the National Resource Conservation Service (NRCS) or US Geological Survey in positions similar to those mentioned above or as managers and consultants for disaster relief bodies such as FEMA.

Resource needs:

No additional resources are required to establish the proposed Ecological Restoration major at Virginia Tech. The School of Plant and Environmental Science recently filled tenure-track faculty position in Ecological Restoration, and that person will contribute to teaching courses within the major.

Administration:

The Ecological Restoration major will be administered by the School of Plant and Environmental Sciences with the cooperation of the College of Agriculture and Life Sciences. If approved for addition to the Bachelor of Science in Environmental Science, we hope students can begin enrolling in the Ecological Restoration major Spring 2021. First year eligibility for graduation would be calendar year 2022. This is a new major so no transition plan will be needed.

College of Agriculture and Life Sciences
School of Plant and Environmental Sciences
Bachelor of Science in Environmental Science
Major in Ecological Restoration
For students entering under UG catalog 2021-2022

Pathways to General Education (44-47 credits)

Concept 1 – Discourse (9 credit hours)

1F – Foundational

____ (3) ENGL 1105 First-Year Writing – F, S

____ (3) ENGL 1106 First-Year Writing – F, S, SI, SII

1A – Advanced/Applied

____ (3) – F, S, W, SI, SII

Concept 2 – Critical Thinking in the Humanities (6 credits)

____ (3) – F, S, W, SI, SII

____ (3) – F, S, W, SI, SII

Concept 3 – Reasoning in the Social Sciences (6 credits)

____ (3) AAEC 1005 Econ Food Fiber Sys
or ECON 2005 Principles of Economics – F, S

____ (3) – F, S, W, SI, SII

Concept 4 – Reasoning in the Natural Sciences (8 credits)

____ (3) CHEM 1035: General Chemistry* – F, S, SI, SII

____ (1) CHEM 1045: General Chemistry Laboratory* – F, S, SI, SII

____ (3) CHEM 1036: General Chemistry* – F, S, SI, SII

____ (1) CHEM 1046: General Chemistry Laboratory* – F, S, SI, SII

Concept 5 – Quantitative and Computational Thinking (11 credits)

5f – Foundational (8 credits)

____ (3) MATH 1025: Elementary Calculus – F, S, SI, SII

____ (3) MATH 1026: Elementary Calculus – F, S, SI, SII

5a – Advanced/Applied (3 credits)

____ (3) STAT 3615 Biological Statistics* – F, S, SI, SII

Concept 6 – Critique and Practice in Design and the Arts (6 credits)

6d – Design

____ (3) – F, S, W, SI, SII

6a – Arts

____ (3) – F, S, W, SI, SII

Concept 7 – Critical Analysis of Identity and Equity in the United States (3 credits)

Edit "(may be double-counted with another core concept)" to read, "(may be double-counted with another Pathways concept)"

____ (3) – F, S, W, SI, SII

Common Degree Core Requirements (21)

__ (1) ALS 1234: CALS First Year Seminar - F

__ (3) BIOL 1105: Principles of Biology – F, W, SI

__ (3) BIOL 1106: Principles of Biology – S, W, SII

__ (3) CSES/ENSC 3114 or GEOS 3614: Soils* – F

__ (1) CSES/ENSC 3124 or GEOS 3624: Soils Laboratory* - F

__ (3) ENSC 3604: Fundamentals of Environmental Science* - F

__ (3) GEOG 2084: Principles of GIS – F, S *or* GEOG 4354: Introduction to Remote Sensing *or* FREC 4114 Informational Technologies for Natural Resources Management* – F

__ (3) GEOS 1004: Introduction to Earth Science
or GEOS 2104 Elements of Geology - F

__ (1) ENSC 4864: Environmental Science Capstone*

Major Requirements for Ecological Restoration (21 credits)

__ (3) BIOL/HORT 2304: Plant Biology* – F, S

__ (3) BIOL 2804: Ecology* – F, S, SII

__ (3) BIOL 3204: Plant Taxonomy* - S

__ (3) ENSC 3244: Ecological Restoration*

__ (3) CSES/ENSC 3644: Plant Materials for Environmental Restoration * – S

__ (3) CSES/ENSC 4774: Reclamation of Disturbed Lands* – F (even years)

__ (3) PPWS 4604: Biological Invasions* - F

Ecology Restricted Electives (choose 9 credits)

__ (3) ALS 3404: Ecological Agriculture – F

__ (4) BIOL 4004: Freshwater Ecology* – F

__ (3) BIOL 4114: Global Change Ecology*

__ (3) CSES/FREC 4334: Agroforestry - F

__ (3) CSES/ENSC 4764: Bioremediation - F

__ (3) CSES 4554: Forage Crop Ecology- S

__ (3) HORT/FREC 2134: Plants & Greenspaces Urban Com – F,W

*** Prerequisites: Some courses listed on this checksheet may have pre-/co-requisites; please consult the University Course Catalog or check with your advisor**

College of Agriculture and Life Sciences
School of Plant and Environmental Sciences
Bachelor of Science in Environmental Science
Major in Ecological Restoration
For students entering under UG catalog 2021-2022

Plant and Soil Sciences Restricted Electives (choose 6 credits)

__ (3) HORT 2244: Plant Propagation – S
__ (3) HORT 4064: Soil Microbiology* – F
__ (3) HORT 3324: Herbaceous Landscape Plants*
__ (3) CSES 4174: Soil Evaluation and Sampling* – S
__ (3) CSES 4214: Soil Fertility and Management* - F
__ (3) CSES/ENSC 4854: Wetlands Soils and Mitigation* – F

Human Dimensions Restricted Elective (choose 3 credits)

__ (3) AAEC 3314: Environmental Law*- S
__ (3) AAEC 3324: Environmental Sustain Dev Econ* - S
__ (3) ALCE 4304: Community Education & Development* - F
__ (3) UAP/PSCI 3344: Global Environ Issues*– F, S
__ (3) UAP 3354: Environ Policy & Plan – F
__ (3) UAP 4344: Law of Critical Environmental Areas – S

Restricted Electives (choose 12 credits)

___ (3) BIOL 2504: General Zoology* - S
___ (3) CSES/ENSC/BIOL 4164: Environmental Microbiology* – S
___ (3) CSES/ENSC 3614: Soil Physical & Hydrological Properties* – S
__ (3) CSES/ENSC/CHEM 4734: Environmental Soil Chemistry*– S
__ (2) ENSC 4414: Monitoring & Analysis of the Environment* – S
__ (3) CSES/ENSC 4314: Water Quality* - S
__ (3) FIW 2314: Wildlife Biology* - S
__ (3) FIW 2324: Wildlife Field Biology* – F, S
__ (3) FIW 4534: Ecology & Management of Wetland Systems* – F
__ (3) FIW 4114: Biodiversity Conservation*
__ (3) GEOG/WATR 2004: Water, Environment & Society - F
__ (3) GEOG 3104: Environmental Problems Population and Development -S
__ (3) GEOG/GEOS 4084: Modeling with GIS* – F, S
__ (3) GEOG 4314: Analysis in GIS* – S
__ (3) HORT 2134: Plants & Greenspaces Urban Com – F, W
__ (3) HORT 3325: Woody Landscape Plants – F
___ (3) HORT 3326: Woody Landscape Plants - S
___ (3) UAP 4374: Land Use and Environ* – F

Free Electives (number needed to complete 120 credits)

___ ( ) _____
___ ( ) _____
___ ( ) _____

Notes:

Total Hours Required:120

- GPA requirements:
  - Overall GPA: 2.0 each semester
  - In major GPA: 2.0 by graduation
- Upon having attempted 60 semester credits (including transfer, advanced placement, advanced standing, and credit by examination) satisfactory progress towards a B.S. degree in ENSC will include having passed at least 24 semester credits which meet the Pathways of General Education requirements
- Language Study Requirement: Sequence of two foreign language courses or equivalent transfer/high school credit (6 cr.)
- *Some courses listed on this checksheet may have pre-/co-requisites; please consult the University Course Catalog or check with your advisor.
- Key Table (semester course offered)
  - F – Fall
  - S – Spring
  - W – Winter
  - SI – Summer, Part I
  - SII – Summer, Part II
- Graduates from this major will meet the knowledge requirements to become Certified Ecological Restoration Practitioners in Training (CERPIT)

*** Prerequisites: Some courses listed on this checksheet may have pre-/co-requisites; please consult the University Course Catalog or check with your advisor**

VirginiaTech
College of Science

Department of Geosciences (MC0420)
Derring Hall, RM 4044, Virginia Tech
926 W. Campus Drive
Blacksburg, Virginia 24061
540-231-6521 Fax: 540-231-3386
www.geos.vt.edu

March 26, 2019

Dear Dr. Tracy,

The Department of Geosciences supports inclusion of the course(s) listed below as an addition to the Environmental Science degree core, which is administered by the School of Plant and Environmental Sciences.

The department welcomes the enrollment of additional students in these courses, and we acknowledge additional departmental resources are not required.

Degree Core courses
GEOS 1004 (3) Introduction to Earth Science

Sincerely,

Madeline Schreiber

Madeline Schreiber
Professor and Associate Head
Geosciences
mschreib@vt.edu

VIRGINIA TECH

Benjamin F. Tracy <bftracy@vt.edu>

course inclusion in Ecol. Restoration major

Crawford, Tom <tomc3@vt.edu> Mon, Apr 1, 2019 at 4:56 PM
To: "Tracy, Benjamin F." <bftracy@vt.edu>

Ben,

This looks great. Geography approves the course inclusions. See attached memo. I corrected a couple of course names that needed update (e.g. Into GIS is now Principles of GIS).

Let me know if you need anything else,

Tom Crawford

[Quoted text hidden]

Letter to Geography Ecol Restoration_edits.docx
13K

To: Benjamin Tracy, Associate Director Undergraduate Programs, School of Plant and Environmental Sciences

From: Tom Crawford, Department Chair, Department of Geography

Re: Inclusion of courses to major in Ecological Restoration (BS Degree in Environmental Science) for proposed major checksheet

Date: March 26, 2019

The Department of Geography supports inclusion of the course(s) listed below for the new Major in Ecological Restoration administered by the School of Plant and Environmental Sciences. The department welcomes the enrollment of additional students in these courses, and we acknowledge additional departmental resources are not required.

Degree Core courses

Major Required Courses

GEOG 2084 Principles of GIS or GEOG 4354 Intro Remote Sensing

Restricted Elective Courses

GEOG 2004 (3) Water, Environment and Society

GEOG 3104 (3) Enviro Problems, Population, and Dev

GEOG 4084 (3) Modeling with GIS

GEOG 4314 (3) Spatial Analysis in GIS

COLLEGE OF AGRICULTURE AND LIFE SCIENCES VIRGINIA TECH

Curtis R. Friedel, Ph.D.
Dept. Agricultural, Leadership, and Community Education
214 Litton-Reaves Hall (0343)
Blacksburg, Virginia 24061
Phone: (540) 231-8177 Fax: (540) 231-3824
Email: *cfriedel@vt.edu*
www.alce.vt.edu

Wednesday, March 27, 2019

To: Benjamin Tracy, Associate Director Undergraduate Programs, School of Plant and Environmental Sciences

From: Curt Friedel, Undergraduate Program Director, Department of Agricultural, Leadership, and Community Education

Re: Inclusion of courses to major in Ecological Restoration (BS Degree in Environmental Science) for proposed major checksheet

The Department of Agricultural, Leadership, and Community Education supports inclusion of the course(s) listed below for the new Major in Ecological Restoration administered by the School of Plant and Environmental Sciences. The department welcomes the enrollment of additional students in these courses, and we acknowledge additional departmental resources are not required.

Degree Core courses

Major Required Courses

Restricted Elective Courses
ALCE 4304 (3) Community Educ and Dev

Sincerely,

Curtis R. Friedel, Ph.D.
Associate Professor
Director, ALCE Undergraduate Programs

VIRGINIA TECH

Benjamin F. Tracy <bftracy@vt.edu>

course inclusion in Ecol. Restoration major

3 messages

Benjamin F. Tracy <bftracy@vt.edu> Wed, Mar 27, 2019 at 10:23 AM
To: pender@vt.edu

Dear Kelly - I am the current Associate Director for Undergraduate Programs in the School of Plant and Environmental Sciences. The School would like to propose a new major in Ecological Restoration and, if possible, include a courses from English in the proposed curriculum as Pathways requirements:

Pathways courses:

__ ENGL 1105	(3)	First Year Writing
__ ENGL 1106	(3)	First Year Writing

I do not expect the new major will increase enrollment significantly but please let me know if you have any questions. If not, I have attached the draft checksheet and some text to paste into your letterhead if you agree to the inclusion. Please feel free to edit memo as you wish and return back to me if approved.

Thanks and again please let me know if you have any questions or concerns.

Regards,
Ben Tracy

Benjamin F. Tracy, PhD
Associate Director of Undergraduate Programs
School of Plant and Environmental Sciences - Virginia Tech
185 Ag. Quad Lane (MC 0404)
Blacksburg, Va 24061
Email:bftracy@vt.edu
Office Ph: 540.231.8259

2 attachments

Letter to ENG Ecol Restoration.docx
19K

Checksheet Ecological-Restoration 3.25.19.docx
44K

Kelly Pender <pender@vt.edu> Mon, Apr 1, 2019 at 12:50 PM
To: "Benjamin F. Tracy" <bftracy@vt.edu>

Dear Ben,
Sure--this is no problem. You can list ENGL 1105 and 1106.

best,
Kelly

Kelly Pender, PhD
Associate Chair, Department of English
Associate Professor of English
Virginia Tech
232 Shanks Hall (0112)
181 Turner St. NW
Blacksburg, VA 24061

pender@vt.edu
540-231-9077

[Quoted text hidden]

Benjamin F. Tracy <bftracy@vt.edu> Mon, Apr 1, 2019 at 1:11 PM
To: Kelly Pender <pender@vt.edu>

Thank you!
[Quoted text hidden]
[Quoted text hidden]

Stauffer, Dean <dstauffe@vt.edu>	
to:	"Tracy, Benjamin F." <bftracy@vt.edu>
date:	Oct 7, 2019, 10:07 AM
subject:	RE: Revised Ecol. Restoration Checksheet
mailed-by:	vt.edu
security:	Standard encryption (TLS) Learn more
:	Important mainly because you often read messages with this label.

Good morning, Ben –

I am pleased to inform you that Dr. Snodgrass has agreed to the inclusion of the following courses in your proposed Ecological Restoration major:

FIW 2314 (3) Wildlife Biology

FIW 2324 (3) Wildlife Field Biology

FIW 4534 (3) Ecology and Mgmt of Wetlands

FIW 4114 (3) Biodiversity Conservation

I also suggest you add FIW 4434 Wildlife Habitat Ecology and Management to your list. That is a class that I teach and I believe it would have relevance to students interested in restoration with a view to restoring/enhancing wildlife habitat.

Sincerely,

Dean

Dean F. Stauffer, *CWB*

Professor and Associate Department Head for Undergraduate Affairs

Department of Fish and Wildlife Conservation

College of Natural Resources and Environment

152 Cheatham Hall

Virginia Tech, Blacksburg, VA 24061

Mathematics Department
225 Stanger Street
460 McBryde Hall
Blacksburg, VA 24061
Ph: (540) 231-6536
Fax: (540) 231-5960

March 28, 2019

Benjamin Tracy
Associate Director, Undergraduate Programs
School of Plant and Environmental Sciences

Dear Ben:

The Department of Mathematics supports inclusion of MATH 1025 and 1026 as degree core courses for the new Major in Ecological Restoration (BS Degree in Environmental Science) administered by the School of Plant and Environmental Sciences.

We accept your projection that the major should reach about 20 students per year at scale and that most of these students will have taken MATH 1025 and 1026 in other majors. Hence, we expect to be able to support the new major with no new resources. We will, of course, monitor our enrollments and verify that this is the case.

Best regards,

Robert C. Rogers
Professor and Associate Chair

Department of Chemistry
1040 Drillfield Drive
Davidson Hall, Room 109F
Blacksburg, Virginia 24061
P: (540) 231-6629 F: (540) 231-3255
pamateis@vt.edu

To: Benjamin Tracy, Associate Director Undergraduate Programs, School of Plant and Environmental Sciences

From: Patricia Amateis, Director of Undergraduate Programs, Department of Chemistry

Re: Inclusion of courses to major in Ecological Restoration (BS Degree in Environmental Science) for proposed major checksheet

Date: February 28, 2020

The Department of Chemistry supports inclusion of the course(s) listed below for the new Major in Ecological Restoration administered by the School of Plant and Environmental Sciences. We acknowledge additional departmental resources are not required.

Degree Core courses
Pathways courses:

CHEM 1035	(3)	General Chemistry
CHEM 1045	(1)	General Chemistry Lab
CHEM 1036	(3)	General Chemistry
CHEM 1046	(1)	General Chemistry Lab

Major Required Courses

Restricted Elective Courses
CHEM 2535 (3) Organic Chemistry

Sincerely,

Dr. Patricia G. Amateis

Patricia G. Amateis

Associate Professor of Chemistry
Director of Undergraduate Programs

School of Public and International Affairs
201 Architecture Annex
140 Otey Street, NW
Blacksburg, Virginia 24061
(857) 222-3339
https://ralphphall.com/

April 1, 2019

RE: SPIA Support for new major in Ecological Restoration

To whom it may concern:

I am writing in support of the proposal to establish a new major in Ecological Restoration in the School of Plant and Environmental Sciences.

The School of Public and International Affairs (SPIA) Undergraduate Program is pleased to offer the following courses as restricted electives in this new major:

- UAP 3354 Introduction to Environmental Policy and Planning
- UAP 4344 Law of Critical Environmental Areas
- UAP 4374 Land Use and Environment: Policy and Planning

These courses are offered on an annual basis and are required for our Environmental Policy and Planning (EPP) major. UAP 4344 and 4374 are also restricted electives for our Smart and Sustainable Cities major. At this time, the inclusion of UAP 3354, 4344, and 4374 as a restricted electives in the proposed Ecological Restoration major is not anticipated to require any additional resources other than the possibility of a larger classroom at some future time. Should these courses reach capacity, they will be major restricted during course request and the first week of drop add to ensure students in our EPP major are able to register.

Yours sincerely,

Ralph P. Hall, Associate Professor
Director, SPIA Undergraduate Program

COLLEGE OF SCIENCE
STATISTICS
VIRGINIA TECH

Department of Statistics
250 Drillfield Drive
Hutcheson Hall, 406-A
Blacksburg, Virginia 24061
P: (540) 231-5657 F: (540) 231-3863

April 1, 2019

Benjamin Tracy
Associate Director Undergraduate Programs,
School of Plant andEnvironmental Sciences

Dear Dr. Tracy:

The Department of Statistics supports inclusion of the course(s) listed below for the new Major in Ecological Restoration administered by the School of Plant and Environmental Sciences. The department welcomes the enrollment of additional students in the course listed below, and we acknowledge additional departmental resources are not required at this time.

Degree Core courses
STAT 3615 (3) Biological Statistics

Sincerely,

David Higdon
Professor and Interim Head

COLLEGE OF AGRICULTURE AND LIFE SCIENCES
AGRICULTURAL AND APPLIED ECONOMICS
VIRGINIA TECH

Agricultural & Applied Economics
250 Drillfield Drive
Hutcheson Hall, Suite 208
Blacksburg, Virginia 24061
P: (540) 231-6301 F: (540) 231-7417

To: Benjamin Tracy, Associate Director Undergraduate Programs, School of Plant and Environmental Sciences

From: Mike Ellerbrock, Undergraduate Program Director, Department of Agricultural and Applied Economics

Re: Inclusion of courses to major in Ecological Restoration (BS Degree in Environmental Science) for proposed major checksheet

Date: March 26, 2019

The Department of Agricultural and Applied Economics supports inclusion of the course(s) listed below for the new Major in Ecological Restoration administered by the School of Plant and Environmental Sciences. The department welcomes the enrollment of additional students in these courses, and we acknowledge additional departmental resources are not required.

Degree Core courses
__ AAEC 1005 (3) Econ of Food & Fiber

Major Required Courses

Restricted Elective Courses
AAEC 3314 (3) Environmental Law
AAEC 3324 (3) Environment Sustain Dev Econ