

Proposal for a new Major in 'Integrated Agriculture Technologies (IAT)

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: 10.18.21

The School of Plant and Environmental Sciences (SPES) with the cooperation of the College of Agriculture and Life Sciences is proposing a new major: '**Integrated Agriculture Technologies'(IAT)**'. The new major will be housed under the new Bachelors of Science degree in Plant Science in the School of Plant and Environmental Sciences.

Need for new major:

Projections suggest that the world's population may approach 10 billion by 2050. The UN Food and Agriculture Organization predicts that we will need to boost worldwide crop production by 50-70 percent over the next several decades in order to feed the anticipated population of 2050. How to meet these food needs in a changing climate with shrinking land resources while protecting land and environmental resources may be one the greatest challenges ever faced by humanity. To meet this challenge, we must prepare and train a new generation of students to work in agricultural sciences. This training will need to incorporate the use of cutting-edge technologies into agricultural production as they are expected to play a central role in helping solve future food production challenges.

Integrated or Connected Technologies is an umbrella term for an emerging sub-discipline in agriculture that involves the integration of advanced technologies into existing farming practices through internet connectivity. This subdiscipline is developing in response to agricultural operations that are becoming more connected in ways that were previously impossible because of rapid advancements in robotics, sensors, communications, and data analytics. The integration of computer technology, plant and soil sensors, GPS navigation, satellite imagery, and drone imagery are revolutionizing crop production to make it more efficient, productive, sustainable, and automated. The College of Agriculture and Life Sciences (CALS) recognizes this new subdiscipline is becoming one of the fastest growing sectors in agriculture and, in response, recently created the Center for Advanced Innovation in Agriculture (CAIA). The Center for Advanced Innovation in Agriculture represents a major effort within the College to coordinate research, teaching, and outreach efforts associated with new agriculture technologies and data analytics.

The School of Plant and Environmental Sciences (SPES) also recognizes that agriculture is experiencing a fast-paced technological revolution. We also believe that optimal deployment

of these sophisticated tools will require a thorough understanding of the crop and soil sciences. To prepare students for work in this growing subdiscipline, SPES is proposing a new major entitled 'Integrated Agriculture Technologies' (IAT). The primary objective of the IAT major will be to produce students who can work across disciplines by having a unique combination of technological know-how and extensive practical knowledge in the crop and soil sciences. Moreover, we feel development of this new major represents an opportunity to attract a new generation of tech-savvy students into farming, which, otherwise, is expected to face a crucial challenge in the future as the current generation of farmers ages and retires.

The proposed major will be housed under the newly approved Plant Science Degree within the School of Plant and Environmental Sciences. The general education and degree requirements will provide students with a foundational training in the crop and soil sciences, computer science, and mathematics. Major specific requirements will include an introductory 2000-level course covering the foundations of Precision Agriculture, and several 4000-level courses that will expose students to agricultural applications of autonomous robots, drones, sensors, and data science (Proposed Checksheet is attached).

Whom program will serve:

The major in Integrated Agriculture Technologies (IAT) will serve students who like working with computers, drones, and sensors yet also want to work outdoors solving real-world problems in the agricultural sciences. We expect the new Plant Science degree program will enroll approximately 160 students in Fall 2022, with the IAT major enrolling an additional 20-30 students within five years.

The new IAT major should position Virginia Tech to become a leader in growing sub-discipline of Integrated/Connected Technologies. Experiential learning opportunities in the areas of ground and aerial robots, IoT, and data science are largely missing in traditional agriculture education curriculums. Our curriculum for the new major is designed to introduce interdisciplinary experiential learning opportunities with these technologies to train the next-generation agricultural work force. The goal of the major is to ensure that the work-force is prepared for the agricultural landscape of the future where it might be required for personnel to be competent in the traditional crop and soil sciences along with an understanding of how elements of technology and data science interface.

With the proposed curriculum described in the attached checksheet, we believe students graduating with the IAT major will be very marketable for many professions in private and public sector organizations as well as graduate school. Graduates may work in a variety of different industries and government agencies, including: agri-business and bio-technology companies, commercial growers of fruit, vegetable, nursery, or greenhouse crops, federal research and regulatory agencies, and alternative energy companies. The U.S. Bureau of Labor Statistics projects 11% growth from 2014 to 2024 for agricultural/plant scientists, faster than the average for all occupations. Market demand for agricultural/plant scientists and related professionals is projected to have sustained 15% growth to 2022 and beyond. The STEM Food

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

Students completing the Integrated Agriculture Technologies (IAT) major will be able to:

- Evaluate effective recommendations for crop, soil and pest management, and their relationship to environmental stewardship
- Demonstrate the economic and environmental benefits of integrated technologies in agronomy and horticulture
- Produce accurate digital maps of fields using spatial information within specialized software
- Solve complex agronomic, horticultural and environmental problems using integrated technologies
- Operate equipment (drones, sensors, controllers), and software (database query, interface, and mapping) to record and analyze crop-based field and greenhouse data
- Install, calibrate, troubleshoot and repair precision agriculture hardware and equipment, including electrical/mechanical/ hydraulic/software systems
- Communicate effectively about integrated technologies in the crop and soil sciences

Resource needs:

No additional resources are requested to initiate the proposed major in Integrated Agriculture Technologies (IAT). The School of Plant and Environmental Sciences recently hired two tenure-track faculty who will teach several new courses in the major and advise students. The School of Plant and Environmental Sciences also has renovated specific laboratory space (Connected Technologies Learning Sandbox) to support the new major. Funds have been allocated for the purchase of drones, robots, sensors, and powerful new computers to equip the Sandbox learning facility.

Administration:

The Integrated Agriculture Technologies (IAT) major will be administered by the School of Plant and Environmental Sciences with the cooperation of the College of Agriculture and Life Sciences. We propose students begin enrolling in the IAT major in Fall 2022. First year eligibility for graduation would be Spring 2023.

**College of Agriculture and Life Sciences
School of Plant and Environmental Sciences
Bachelor of Science in Plant Science
Major in Integrated Agriculture Technologies
For students entering under UG catalog 2022-2023**

Pathways to General Education (44-47 credits)

Concept 1 – Discourse (9 credit hours)

1F – Foundational

- (3) ENGL 1105 First-Year Writing (3 credits) – F, S
- (3) ENGL 1106 First-Year Writing (3 credits) – F, S, SI, SII

1A – Advanced/Applied

- (3) – Choose from Approved Courses

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

- (3) – Choose from Approved Courses
- (3) – Choose from Approved Courses

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) SPES 2244: World Crops: Food & Culture[€] – S

Concept 4 – Reasoning in the Natural Sciences (6 or 8 credits)

- (3) CHEM 1035: General Chemistry* – F, S, SI, SII
- (3) CHEM 1036: General Chemistry* – F, S, SI, SII
- (1) CHEM 1045: General Chemistry Lab* -F
- (1) CHEM 1046: General Chemistry Lab* -S

Concept 5 – Quantitative and Computational Thinking (11 credits)

5f – Foundational (8 credits)

- (3) MATH 1025: Elementary Calculus – F, S, SI, SII
- (3) CS 1014: Intro to Computational Thinking

a – Advanced/Applied (3 credits)

- (3) – Choose from Approved Courses

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

6d – Design

- (3) – Choose from Approved Courses

6a – Arts

- (3) – Choose from Approved Courses

Concept 7 – Critical Analysis of Identity and Equity in the United States (3 credits) (may be double-counted with another Pathways concept)

- (3) SPES 2244: World Crops: Food & Culture[€] – S

Plant Science Degree Core Requirements (25 credits)

- (1) ALS 1234: CALS First Year Seminar or SPES 1004: First Year Seminar – F
- (3) ALCE 3634: Comm Ag & Life Sci in Speaking – F, S
or ALCE 3624: Comm Agriculture in Writing – F, S
- (3) BIOL 1105: Principles of Biology – F, W, SI
- (3) BIOL 1106: Principles of Biology – F, W, SI
- (3) ENSC 1015: Found Environmental Sci – F
- (3) BIOL/HORT 2304: Plant Biology* – F, S
- (3) PPWS 2104: Plants Genes and People* - F
- (4) PPWS 4104: Plant Pathology – F
- (2) SPES 4864: Plant Science Capstone* - TBD

Integrated Agriculture Technologies Major Requirements (25 credits)

- (3) CSES 2444 Agronomic Crops – F
or HORT-2234 Envir Factors in Hort– F
or CSES 2564: Turfgrass Management* - F
- (3) CSES 3114/ENSC 3114/GEOS 3614: Soils* – F
- (1) CSES 3124/ENSC 3124/GEOS 3624: Soils Laboratory* – F
- (3) CSES 2224 Foundations of Precision Agriculture
- (3) CSES 4224 Applied Concepts in Precision Agriculture*
- (3) CSES 4234 Agrosience Data Integration*
- (3) CSES 4524 Drone Applications in Ag Systems*
- (3) CSES 4534 Internet of Things (IoT) for Smart Farming*
- (3) GEOG 2084: Principles of GIS- F, S

Restricted Electives (minimum 18 credits or approved Minor)

- (3) AAEC 2434: Foundations of Agribusiness* – F, S
- (3) AAEC 2104: Personal Financial Planning – F, S
- (3) AAEC 3004: Ag Prod & Cons Econ* – F, S
- (3) AAEC 3314: Environmental Law - S
- (3) AAEC 3504: Marketing Ag Products* – F
- (3) AAEC 3604: Agricultural Law – F
- (3) ALS 3404: Ecological Agriculture – F

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

[€] Satisfies Pathways 3 and 7

Key: F – Fall, S – Spring, W – Winter, SI – Summer, Part I, SII – Summer, Part II

**College of Agriculture and Life Sciences
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- (3) BIOL 2804: Ecology* – F, S, SII
- (3) CS-1064: Intro to Programming in Python
- (3) CS-1044: Intro Prog in C
- (3) CS-1054: Intro to Programming in Java
- (3) CS 1114: Intro to Software Design
- (3) CSES 2244: Ag Global Food Sec and Health – F
- (3) CSES 2434: Crop Evaluation - S
- (3) CSES 3144: Soil Description & Interp* – F
- (3) CSES/ENSC 3614: Soil Phys & Hydro Properties* – S
- (3) CSES 4214: Soil Fertility and Management* – F
- (3) CSES 4144: Plant Breeding & Genetics – S
- (3) CSES/ENSC 3644: Plant for Env Rest* – S
- (3) CSES/ENSC 4134: Soil Genesis & Class* - S
- (3) CSES 4344: Crop Physiology and Ecology - S
- (3) CSES 4544: Forage Crop Ecology – S
- (3) CSES/ENSC 4774: Reclamation of Disturbed Lands* – F
- (3) CSES/ENSC 4764: Bioremediation* - F
- (3) CSES/ENSC 4854: Wetland Soils and Mitigation* - F
- (3) CSES/ENSC/CHEM 4734: Environmental Soil Chemistry* –S
- (3) ENT/PPWS 4264: Pesticide Usage – S
- (3) ENT 4254: Insect Pest Management* – S
- (3) HORT 2184: Plants, Places, Culture Globally – S
- (3) HORT 2234: Envir Factors in Hort - S
- (3) HORT 4064: Soil Microbiology* - F
- (3) GEOG/GEOS 4354 Intro Remote Sensing – F,S
- (3) PHYS-2205: General Physics* – F, S, SI, SII
- (3) PHYS-2206: General Physics* – F, S, SI, SII
- (3) PPWS 2754: Weeds that Shape our World - F
- (3) PPWS 4154: Plant Problem Diagnosis* – F
- (3) PPWS 4604: Biological Invasions* – F
- (3) SPES 2004: Cannabis Sci Ind & Culture- S

Approved Minors

Agribusiness Management and Entrepreneurship
Agricultural and Applied Economics
Animal and Poultry Sciences
Civic Agriculture and Food Systems
Dairy Science
Entomology
Environmental Economics
Environmental Science
Global Food Security and Health
Horticulture
Food Science & Technology
International Trade & Development
Leadership & Social Change
Plant Health Sciences
Turfgrass Management
Wetland Science

Free Electives (to reach 120 Total Credit Hours)

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Note:

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

€ Satisfies Pathways 3 and 7

Key: F – Fall, S – Spring, W – Winter, SI – Summer, Part I, SII – Summer, Part II

**College of Agriculture and Life Sciences
School of Plant and Environmental Sciences
Bachelor of Science in Plant Science
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For students entering under UG catalog 2022-2023**

Total Hours Required: 120

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

Satisfactory Progress:

By the end of the academic year in which the student has attempted 60 credits (including transfer, advanced placement, advanced standing and credit by examination), "satisfactory progress" toward a BS PLSC degree will include:

Passing the following:

- At least 24 credits that apply to the Pathways to General Education
- CHEM 1035 and 1036
- ALS 1234 or SPES 1004, CSES/ENSC 3114 and CSES/ENSC 3124
- 6 credits of Math

GPA Requirements:

- Overall GPA: 2.0 (each semester in order to be in good academic standing)
- In-major GPA: 2.0 (by the time the student graduates)
 - Includes classes in: CSES, HORT, and PPWS

Language Study Requirement - Students who do not complete two years of a single foreign or classical language or American Sign Language in high school, may do so by taking six credits of college-level foreign or classical language or American Sign Language. The six credits used to meet this requirement may not be used to satisfy the minimum number of credits required for gradation.

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

€ Satisfies Pathways 3 and 7

Key: F – Fall, S – Spring, W – Winter, SI – Summer, Part I, SII – Summer, Part II



COLLEGE OF AGRICULTURE AND LIFE SCIENCES
**SCHOOL OF PLANT AND
ENVIRONMENTAL SCIENCES**
VIRGINIA TECH.

**School of Plant and
Environmental Sciences**
185 Ag. Quad Lane
Smyth Hall (0404)
Blacksburg, Virginia 24061
bfracy@vt.edu

To: CALS Curriculum Committee

From: Benjamin Tracy, Associate Director for Undergraduate Programs- School of Plant and Environmental Sciences (SPES)

Date: 25 October 2021

Re: Integrated Agriculture Technologies (IAT) Major

The School of Plant and Environmental Sciences (SPES) proposes to create a new major entitled 'Integrated Agriculture Technologies' (IAT) that will be housed under Bachelor of Science (B.S.) in Plant Science. The School of Plant and Environmental Sciences has all of the faculty, classified support staff, equipment, library, and other resources necessary to create the new major and requests no additional resources. The School of Plant and Environmental Sciences supports creation of the new major and associated curricula.

Sincerely,

Benjamin F Tracy, PhD
Associate Director of Undergraduate Programs



Benjamin F. Tracy <bfracy@vt.edu>

AAEC courses for new major: seeking approval

Ellerbrock, Mike <mebro@vt.edu>

Mon, Jun 7, 2021 at 11:40 AM

To: "Tracy, Benjamin F." <bfracy@vt.edu>

Cc: "Holt, Matthew" <mattholt@vt.edu>, "White, Katie" <katiwhite@vt.edu>

Hi Ben,

AAEC is pleased to collaborate and have your IPET students enroll in our courses below.

No new resources would be required.

Your new major is timely, compelling, and substantive.

Regards,

Mike Ellerbrock, PhD

Prof & Undergrad Dir

From: Benjamin F. Tracy <bfracy@vt.edu>**Sent:** Monday, June 7, 2021 11:22 AM**To:** Ellerbrock, Mike <mebro@vt.edu>**Subject:** AAEC courses for new major: seeking approval

Hi Mike - The School of Plant and Environmental Sciences (SPES) is proposing a new major entitled 'Integrated Plant and Environmental Technologies'. If possible, we would like to include the AAEC courses listed below on the proposed spreadsheet. The major likely will have a few students in the first several years so should not impact enrollment in these courses significantly.

An email response should suffice for approval. Please let me know if there are any questions or if more information is needed.

Thanks!**Ben Tracy****Concept 3 – Reasoning in the Social Sciences****___ (3) AAEC 1005 Econ Food Fiber Sys****Restricted Electives****___ (3) AAEC 2434: Foundations of Agribusiness****___ (3) AAEC 2104: Personal Financial Planning****___ (3) AAEC 3004: Ag Prod & Cons Econ****___ (3) AAEC 3314: Environmental Law****___ (3) AAEC 3504: Marketing Ag Products****___ (3) AAEC 3604: Agricultural Law**

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Benjamin F. Tracy, PhD

Associate Director of Undergraduate Programs



Benjamin F. Tracy <bftracy@vt.edu>

BIOL courses for new major: seeking approval

Richard Walker <rawalker@vt.edu>
To: "Benjamin F. Tracy" <bftracy@vt.edu>

Wed, Jun 9, 2021 at 11:21 AM

Hi Ben,

Jack forwarded your request to me as I handle these approvals. Biological Sciences supports inclusion of **BIOL 1105, 1106 and 2804** on the checksheet for the proposed integrated Plant and Environmental Technologies major.

Rich

Richard A. Walker
Associate Department Head and Associate Professor
Biological Sciences
5070 Derring Hall, [926 West Campus Drive](#)
Virginia Tech, Blacksburg, VA 24061-0406
540-231-3803 (phone) rawalker@vt.edu

From: "Benjamin F. Tracy" <bftracy@vt.edu>
Date: June 7, 2021 at 11:57:32 AM EDT
To: jaevans1@vt.edu
Subject: BIOL courses for new major: seeking approval

[Quoted text hidden]



Benjamin F. Tracy <bftracy@vt.edu>

Plant Biology for new major: seeking approval

Richard Walker <rawalker@vt.edu>

Mon, Dec 6, 2021 at 11:23 AM

To: "Benjamin F. Tracy" <bftracy@vt.edu>

Hi Ben,

Biological Sciences approves inclusion of **BIOL / HORT 2304** Plant Biology on the proposed Integrated Agriculture Technologies major.

Best,

Rich

Richard A. Walker
Associate Department Head and Associate Professor
Biological Sciences
5070 Derring Hall, [926 West Campus Drive](#)
Virginia Tech, Blacksburg, VA 24061-0406
540-231-3803 (phone) rawalker@vt.edu

[Quoted text hidden]



Benjamin F. Tracy <bftracy@vt.edu>

CHEM courses for new major: seeking approval

Patricia Amateis <pamateis@vt.edu>
To: "Benjamin F. Tracy" <bftracy@vt.edu>

Wed, Jun 9, 2021 at 7:52 PM

Hi Ben,

We approve of the inclusion of **CHEM 1035 and CHEM 1036** for the new Integrated Plant and Environmental Technologies major.

Patricia Amateis
Director of Undergraduate Programs
Department of Chemistry
Virginia Tech
[Quoted text hidden]



Benjamin F. Tracy <bfracy@vt.edu>

CS courses for new major: seeking approval

Stephen H Edwards <edwards@cs.vt.edu>

Thu, Oct 14, 2021 at 3:19 PM

To: "Benjamin F. Tracy" <bfracy@vt.edu>

Thank you for sending this again. The Department of Computer Science approves of including **CS 1014** as a required course and using the other CS courses listed here as restricted elective choices in the new Integrated Agriculture Technologies major. No new resources are required to support this request.

-- Steve

Virginia Tech, CS Dept. Web-CAT: Web-based Center for Software Testing
2202 Kraft Drive Automatic grading using student-written tests
Blacksburg, VA 24060 USA <http://web-cat.org/>
(540) -231-5723 <http://people.cs.vt.edu/~edwards/>

On Thu, Oct 14, 2021 at 3:14 PM Benjamin F. Tracy <bfracy@vt.edu> wrote:

Hello Steve - I tried to give you a call but it looks like your inbox is full. Sorry to bug you again, but my Director is breathing down my neck about getting our new major 'Integrated Agriculture Technologies' into governance. Any chance you could give me an indication whether you will approve inclusion of the courses below for use in the new major? Again, I don't anticipate we will have high enrollment in this major. Optimistically, maybe 20-30 students after about 5 years.

Thanks,
Ben Tracy

Concept 5 – Quantitative and Computational Thinking

__ (3) CS 1014 Intro to Computational Thinking

Restricted Electives

__ (3) CS-1064 Intro to Programming in Python

__ (3) CS-1044 Intro Prog in C

__ (3) CS-1054 Intro to Programming in Java

__ (3) CS- 1114 Intro to Software Design



Benjamin F. Tracy <bfracy@vt.edu>

ENGL courses for new major: seeking approval

Rebecca Weaver-Hightower <rebeccawh@vt.edu>

Thu, Jun 10, 2021 at 2:29 PM

To: "Ferguson, Laura" <lauraf92@vt.edu>, "Benjamin F. Tracy" <bfracy@vt.edu>

Prof. Tracy,

Yes, please do include those two courses on your checksheet for your new major. Best of luck!

On Thu, Jun 10, 2021 at 11:59 AM Ferguson, Laura <lauraf92@vt.edu> wrote:

I accidentally missed this on Monday! I think they asked us about this same thing but for a different major before – I just wanted you to confirm as a more official person than me 😊

Thank you!

Laura

From: "Benjamin F. Tracy" <bfracy@vt.edu>**Date:** Monday, June 7, 2021 at 11:43 AM**To:** Laura Ferguson <lauraf92@vt.edu>**Subject:** ENGL courses for new major: seeking approval

Hello Laura - The School of Plant and Environmental Sciences (SPES) is proposing a new major entitled 'Integrated Plant and Environmental Technologies'. If possible, we would like to include the ENGL courses listed below on the proposed spreadsheet. The major likely will have a few students in the first several years so should not impact enrollment in these courses significantly.

An email response should suffice for approval. If you cannot approve, please forward to the appropriate person in the Department. Please let me know if there are any questions or if more information is needed.

Thanks!**Ben Tracy****Concept 1 – Discourse**

____ (3) ENGL 1105 First-Year Writing

(3) ENGL 1106 First-Year Writing

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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: bfracy@vt.edu

Office Ph: 540.231.8259

<https://viriniatech.zoom.us/j/8402318259>

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Ben Tracy <bfracy@vt.edu>

ENT courses for new major: seeking approval

Kring, Timothy <timkring@vt.edu>

Mon, Jun 7, 2021 at 2:35 PM

To: "Tracy, Benjamin F." <bfracy@vt.edu>

Cc: "Shelor, Kathy" <kshelor@vt.edu>, "Wilson, James" <jamesmw3@vt.edu>

Hi Ben,

It would be fine to uncl these courses on the spreadsheet. This email provides that approval.

Relatedly, I would like to schedule a time to chat with you about these courses going forward. IPM is close to limited out right now without adding a lab section and changing the lecture location (which would likely alter the time/day. The Pesticide Usage course has been completely restricted and with a new instructor, and we'd really like to evaluate increased enrollment for a few SPES majors, particularly when training students in field crops and turf where handling pesticides and the requirement for full knowledge of regulations and licensure is routine.

Tim

On Jun 7, 2021, at 11:11 AM, Benjamin F. Tracy <bfracy@vt.edu> wrote:

Hello Tim - The School of Plant and Environmental Sciences (SPES) is proposing a new major entitled 'Integrated Plant and Environmental Technologies'. If possible, we would like to include the ENT courses listed below on the proposed spreadsheet. The major likely will have a few students in the first several years so should not impact enrollment in these courses significantly.

An email response should suffice for approval. Please let me know if there are any questions or if more information is needed.

**Thanks!
Ben Tracy**

Restricted Electives

- __ (3) ENT/PPWS 4264: Pesticide Usage**
- __ (3) ENT 4254: Insect Pest Management**

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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: bfracy@vt.edu](mailto:bfracy@vt.edu)
Office Ph: 540.231.8259
<https://virginiatech.zoom.us/j/8402318259>





COLLEGE OF NATURAL
RESOURCES AND ENVIRONMENT
VIRGINIA TECH.

Department of Geography
238 Wallace Hall (0115)
295 West Campus Drive
Blacksburg, Virginia 24061
(540) 231-7557
E-mail: geography@vt.edu
geography.vt.edu

October 18, 2021

To whom it may concern,

I support the inclusion of the following courses in the proposed major Integrated Agriculture Technologies.

Major Requirement

- GEOG 2084 Principles of GIS

Restricted Elective

- GEOG 4354 Introduction to Remote Sensing

No new resources are needed.

Sincerely,

A handwritten signature in blue ink that reads 'T. Crawford'.

Tom Crawford
Professor and Department Chair of Geography



Benjamin F. Tracy <bfracy@vt.edu>

Re: approval letter for PHYS courses in SPES

John Simonetti <jsimonet@vt.edu>

Tue, Jun 8, 2021 at 4:15 PM

To: "Benjamin F. Tracy" <bfracy@vt.edu>

Cc: "Walker-Green, Diane" <dwalkerg@vt.edu>, Jean Heremans <heremans@vt.edu>

Dear Ben,

The Department of Physics is in support of your adding **PHYS 2205 and PHYS 2206** to the checksheet for your new major of "Integrated Plant and Environmental Technologies."

-John Simonetti
Associate Chair
Department of Physics

On Mon, Jun 7, 2021 at 12:54 PM Walker-Green, Diane <dwalkerg@vt.edu> wrote:

I'll forward your request to the undergrad committee for a letter of support.

Sent from Dee's iPad.....

Diane

Diane L. Walker-Green

Director of Undergraduate Advising and Enrollment Management

Virginia Tech - Physics Department

850 West Campus Dr.

222 Robeson Hall (0435)

Blacksburg, VA 24061

(540) 231-5792 – dwalkerg@vt.edu

The only place **Success comes before **Work** is in the dictionary. Vince Lombardi**

From: Benjamin F. Tracy <bfracy@vt.edu>

Sent: Monday, June 7, 2021 12:07 PM

To: Walker-Green, Diane

Subject: PHYS courses for new major: seeking approval

Hello Diane- The School of Plant and Environmental Sciences (SPES) is proposing a new major entitled 'Integrated Plant and Environmental Technologies'. If possible, we would like to include the PHYS courses listed below on the proposed spreadsheet. The major likely will have a few students in the first several years so should not impact enrollment in these courses significantly.

An email response should suffice for approval. Please let me know if there are any questions or if more information is needed.



Benjamin F. Tracy <bfracy@vt.edu>

Approval for ALCE courses

Rutherford, Tracy <trutherford@vt.edu>
To: "Tracy, Benjamin F." <bfracy@vt.edu>

Fri, Feb 4, 2022 at 11:14 AM

Ben,

We approve the inclusion of these ALCE courses in the new IAT major.

Thanks,

TR

Tracy Rutherford, Ph.D.

Professor and Department Head

Virginia Tech | Department of Agricultural, Leadership, and Community Education

[175 W. Campus Drive](#), Litton-Reaves Hall, Room 214

Blacksburg, VA 24061

(540) 231-8187 | trutherford@vt.edu

[Schedule an appointment](#)



[Quoted text hidden]



Benjamin F. Tracy <bfracy@vt.edu>

Approval for ALCE courses

Benjamin F. Tracy <bfracy@vt.edu>

Fri, Feb 4, 2022 at 10:47 AM

To: trutherford@vt.edu

Hello Traci - We would like to include two ALCE courses on the checksheet for our new major - Integrated Agriculture Technologies (IAT). I thought I had gotten approval to use these, but now realize I was mistaken. If you agree to allow inclusion of the courses listed below on the checksheet (attached), please reply with an email when you have a chance.

Thanks!

Ben Tracy

Degree Core:

ALCE 3634: Comm Ag & Life Sci in Speaking

ALCE 3624: Comm Agriculture in Writing

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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: bfracy@vt.edu

Office Ph: 540.231.8259

<https://virginiatech.zoom.us/j/8402318259>



IAT Checksheet 11.18.21.docx

26K



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

December 6, 2021

Dear Colleagues:

The Department of Mathematics supports the inclusion of **MATH 1025**: Elementary Calculus in the College of Agriculture and Life Sciences School of Plant and Environmental Sciences Bachelor of Science in Plant Science Major in Integrated Agriculture Technologies.

Based on the estimate of 20-25 new majors with about 25% already having taken MATH 1025 we expect to be able to teach this course with no new resources.

Best regards,


A handwritten signature in black ink, appearing to read 'R.C. Rogers'.

Robert C. Rogers
Professor and Associate Chair



MEMORANDUM

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

FROM: Susan Sumner, 
Associate Dean and Director of Academic Programs

DATE: February 7, 2022

SUBJECT: Integrated Agriculture Technologies Major Checksheet and ALS courses

It is appropriate to include ALS 1234 CALS First Year Seminar and ALS 3404 Ecological Agriculture to the School of Plant and Environmental Sciences new major, Integrated Agriculture Technologies checksheet. This will not require any new resources.