

Date Submitted: 12/17/21 2:29 pm

Viewing: **10KP5163BS : Agricultural & Biological Engineering, BS**

Last approved: 10/11/21 8:44 am

Last edit: 02/15/22 10:41 am

Changes proposed by: Kent Rausch

Catalog Pages	Agricultural & Biological Engineering, Concentration: Agricultural Engineering, BS
Using this Program	Agricultural & Biological Engineering, Concentration: Biological Engineering, BS

Proposal Type:

In Workflow

1. U Program Review
2. 1741 Committee Chair
3. 1741 Head
4. 1227 Head
5. KP Committee Chair
6. KP Dean
7. KL Committee Chair
8. KL Dean
9. University Librarian
10. Provost
11. Senate EPC
12. Senate
13. U Senate Conf
14. Board of Trustees
15. IBHE
16. HLC
17. DMI

Approval Path

1. 01/05/22 2:46 pm
Deb Forgacs (dforgacs):
Approved for U Program Review
2. 01/05/22 3:01 pm
Brooke Newell (bsnewell):
Rollback to U Program Review for 1227 Head
3. 01/05/22 3:03 pm
Deb Forgacs (dforgacs):
Approved for U Program Review
4. 01/05/22 3:07 pm
Kent Rausch

- (krausch):
Approved for 1741
Committee Chair
5. 01/05/22 4:30 pm
Ronaldo
Maghirang
(ronaldom):
Approved for 1741
Head
6. 01/06/22 11:12
am
Brooke Newell
(bsnewell):
Approved for 1227
Head
7. 02/03/22 11:40
am
Brooke Newell
(bsnewell):
Approved for KP
Committee Chair
8. 02/03/22 11:47
am
Candy Deaville
(candyd):
Approved for KP
Dean
9. 02/03/22 2:09 pm
Brianna Gregg
(bjgray2):
Approved for KL
Committee Chair
10. 02/04/22 10:22
am
Anna Ball (aball):
Approved for KL
Dean
11. 02/04/22 1:02 pm
John Wilkin
(jpwilkin):
Approved for
University
Librarian
12. 02/04/22 1:02 pm
Kathy Martensen
(kmartens):
Approved for
Provost

History

1. Dec 11, 2018 by Deb Forgacs (dforgacs)
2. Dec 15, 2018 by Deb Forgacs (dforgacs)
3. Jul 31, 2019 by Deb Forgacs (dforgacs)
4. Feb 26, 2020 by Brooke Newell (bsnewell)
5. Mar 31, 2020 by Deb Forgacs (dforgacs)
6. Apr 14, 2020 by Deb Forgacs (dforgacs)
7. May 13, 2020 by Deb Forgacs (dforgacs)
8. Oct 11, 2021 by Brooke Newell (bsnewell)

Major (ex. Special Education)

This proposal is
for a:
Revision

Administration Details

Official Program Name	Agricultural & Biological Engineering, BS	
Sponsor College	Agr, Consumer, & Env Sciences Grainger College of Engineering	
Sponsor Department	Agricultural & Biological Engr Engineering Administration	
Sponsor Name	Ronaldo Maghirang , Kent Rausch	
Sponsor Email	ronaldom@illinois.edu , krausch@illinois.edu	
College Contact	Jonathan Makela Brooke Newell	College Contact Email
	jmakela@illinois.edu bsnewell@illinois.edu	

College Budget Officer [Tessa Hile](#)

Officer

College Budget Officer Email tmhile@illinois.edu

Officer Email

List the role for rollbacks (which role will edit the proposal on questions from EPC, e.g., Dept Head or Initiator) and/or any additional stakeholders. *Purpose: List here who will do the editing work if proposal needs rolled back. And any other stakeholders.*

[Brooke Newell, bsnewell@illinois.edu](#); [Ronaldo Maghirang, ronaldom@illinois.edu](#) (ABE head); [Kent Rausch, krausch@illinois.edu](#) (ABE CnC editing)

Does this program have inter-departmental administration?

Yes

Interdisciplinary Colleges and Departments (list other colleges/departments which are involved other than the sponsor chose above)

Please describe the oversight/governance for this program, e.g., traditional departmental/college governance. Inclusion of/roles of elected faculty committees? Inclusion of/roles of any advisory committees.

[Agricultural & Biological Engineering programs are governed through a Courses and Curricula committee consisting of ABE faculty and ex officio officers. Faculty are housed in the College of Agricultural, Consumer and Environmental Sciences \(ACES\), while ABE students graduate through the Grainger College of Engineering. The Agricultural & Biological Engineering department is interdisciplinary.](#)

College [Grainger College of Engineering](#) Agr, Consumer, & Env Sciences

Department [Engineering Administration](#) Agricultural & Biological Engr

Is there an additional department involved in governance?

No

Proposal Title

Effective Catalog Term Fall 2022

Provide a brief, concise description (not justification) of your proposal.

Removed Liberal Education Electives, updated number of free elective hours, and moved footnotes (when possible) into the Program of Study Table (to improve accessibility). Some revisions to core courses, technical electives and biological and natural sciences electives. Courses "not found" were removed and other courses added for accuracy. Math 257 substituted for Math 225, PHYS 213 removed as a required course.

List here any related proposals/revisions and their keys. *Example: This BS proposal (key 567) is related to the Concentration A proposal (key 145) and the Concentration B proposal (key 203).*

This BS proposal is related to ABE: Agricultural Engineering (5270) and the ABE: Biological Engineering (5271) concentrations

Program Justification

Why are these changes necessary?

After careful analysis of programs of studies, various requirements, and course selection for students in the Grainger College of Engineering, we have decided to provide additional flexibility to all engineering undergraduate students by increasing the number of free elective hours in all engineering programs. While the actual number of credit hours for free electives varies by program, within the college -- 8 programs currently provide only 6 credit hours for free electives while an additional 2 have less than 10 -- only 4 programs have more than 10 free elective credits. This lack of free elective credit hours limits students' abilities to efficiently pursue minors, certificates, and other educational opportunities and potentially limits those opportunities only to students coming in with significant AP credit or similar.

The additional free elective credit hours added to the program of study are obtained through removal of the Grainger College of Engineering's Liberal Education requirement, which required engineering students to take an additional 6 credit hours above and beyond the campus' General Education requirement from the Humanities & the Arts, Social & Behavioral Sciences, or a college-curated list of courses. Over time, the Liberal Education requirement has been revised within the college, successively relaxing restrictions and providing additional choice to students (i.e., removal of a sequencing requirement in 1999; addition of the college-curated course list in 2010). Simultaneously, the college-curated list of courses continued to expand to include courses from approximately 120 rubrics across campus (including within The Grainger College of Engineering), gradually removing constraints to allow greater flexibility of choice for students to take advantage of the many opportunities the campus has to offer. Still, in its current form, this additional college-level requirement constrains student choice and interferes with their ability to efficiently pursue minors, certificates, and other educational opportunities across campus unless those opportunities intersect with coursework in the Liberal Education requirement.

Simultaneously, the required engineering orientation course, ENG 100, will be granted 1-credit hour. Previously, this course was a 0-credit course. The allocation of 1-credit appropriately recognizes the time and commitment expected of all students who take this course. In the 1-credit version of ENG 100, content will be added to improve teamwork and interpersonal skills, including topics related to diversity, equity, and inclusion (DEI). The engineering accrediting agency, ABET, will soon be adding DEI requirements for accredited programs. This component of ENG 100 is therefore beneficial to all Grainger Engineering programs and students by providing a common framework on which additional DEI topics can build throughout a student's program of study.

The required MATH 225 (Introductory Matrix Theory, 2 hr) has been substituted with MATH 257 (Linear Algebra with Computational Applications, 3 hr) so that students have more experience with computational methods. The requirement for PHYS 213 (Thermal Physics, 2 hr) has been discontinued; in a review of highly ranked peer programs, none required a thermal physics course. TAM 211 (3 hr) is now required instead of TAM 210 (2 hr). We have verified that these changes do not have an impact on ABET requirements.

The ABE BS carries with it two concentrations, Ag Eng and Biological Eng. ECE 206 is

no longer required but will remain as a Tech Elective. For both concentrations, several courses were added to the Biological and Natural Sciences electives list (FSHN 481, 482, 483, 484 and GEOG 379) and to the Technical Electives list (ABE 426, 450, 451, 452) to reflect current course offerings.

Clarifications were made to the ABE BS Program of Study table to show Concentration credit hours and longstanding addition errors. These changes also do not have an impact on ABET requirements.

Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does the program include other courses/subjects impacted by the creation/revision of this program?

Yes

Required courses

[MATH 257 - Linear Algebra w Computat Appl](#)

[MATH 225 - Introductory Matrix Theory](#)

[PHYS 213 - Univ Physics: Thermal Physics](#)

[TAM 210 - Introduction to Statics](#)

[TAM 211 - Statics](#)

Explain how the inclusion or removal of the courses/subjects listed above impacts the offering departments.

The current Liberal Education requirement is satisfied by a student completing 6 credit hours beyond those required by campus' General Education requirement from Humanities & the Arts, Social & Behavioral Sciences, or a college-curated list of courses (containing courses from over 120 rubrics across campus). An analysis of student course selection in the Liberal Education category indicates 25% of courses are taken in the College of Liberal Arts & Sciences, 20% from the College of Applied Health Sciences, 18% from Gies College of Business, 11% from the College of Agricultural, Consumer and Environmental Sciences, 11% from the College of Fine and Applied Arts, and 9% from The Grainger College of Engineering. Less than 2% of credits are taken in each of the remaining colleges and units across campus.

Although it might stand to reason that removal of the Liberal Education requirement would reduce the amount of credits Grainger Engineering students take outside of their home college, the data do not support that assertion. Specifically, despite the current Liberal Education requirement being set at 6 credit hours, the average number of credit

hours completed from the Liberal Education course list upon graduation is 11.9. Through discussions with departmental and college advisors as well as students, students are making course selections not because the course satisfies the Liberal Education requirement, but because they are interested in the coursework offered outside of their home college, are pursuing minors and other educational opportunities, and are looking to balance course loads between technical and non-technical courses. Taken together, the data and evidence from advisors and students suggest that students will continue to take the types of courses represented on the Liberal Education course list, even if not specifically required to do so.

Attach letters of support or acknowledgement from other departments. [ABE_letter_225_Math_257\[1\].pdf](#)
[Physics_letter_ABE_revision.pdf](#)
[TAM_210_211_Support_Letter_ABE.pdf](#)
[Letters of Acknowledgement - Liberal Education Electives.pdf](#)

Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

The department of Agricultural and Biological Engineering has undergraduate curriculum program education objectives (PEOs) that prepare our graduates to succeed in their career activities relating to the ABE discipline. These PEOs are:

Objective 1: Enter the agricultural and biological engineering profession as practicing engineers and consultants with prominent companies and organizations in diverse areas that include agricultural and off-road equipment manufacturing and automation, food and fiber processing, renewable energy production, environmental conservation and water quality engineering, indoor environmental control, systems informatics and analysis, or other related fields.

Objective 2: Pursue graduate education and research at major research universities in agricultural and biological engineering and related fields.

Objective 3: Advance in their chosen fields to supervisory and management positions.

Objective 4: Engage in continued learning through professional development.

Objective 5: Participate in and contribute to professional societies and community services.

These PEOs were developed and are regularly reviewed by our constituent groups to evaluate, revise and refocus issues relating to the ABE BS program. These constituent groups are:

Students – The purpose of the PEOs is to prepare undergraduate students for employment in agricultural and biological engineering and related fields. Students are served by all five PEOs.

Alumni - ABE alumni are considered a valuable asset to the development and evaluation of the ABE Program Educational Objectives. They are served directly by PEOs 2, 3, 4 and 5 as they continue their professional careers.

Employers – The overall expected student outcome of ABE PEOs is to prepare qualified professional engineers for agricultural and biological engineering fields. Employers are served directly by objectives 1, 3, 4 and 5.

This process allows for continued assessment and improvement to our curricula and to maintain quality and vitality of ABE programs. The ABE Courses and Curriculum Committee and the ABE Faculty Advisory Committee work with department administration to maintain and revise PEOs. The ABE Outcomes and Assessment Committee manages the processes of the development, collection and summarization of PEO review data collection.

Student Outcomes:

The seven student outcomes for the agricultural and biological engineering program are:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Process for Review of the Program Educational Objectives:

The process of periodical reviews is an ongoing continuous improvement process. The ABE Course and Curriculum Committee and the ABE Faculty Advisory Committee work with the department administration to maintain and revise the program educational objectives. The ABE Outcomes and Assessment Committee manages the processes of the development, collection and summarization of the program education objectives review data collection.

Student senior exit interviews are conducted by the Head. A written senior exit survey questionnaire is provided to each graduating senior at the end of the last semester of enrollment. All graduating seniors are asked to participate in a focus group to discuss the nature of their undergraduate experience. Participation in the senior exit interviews and the completion of the written senior exit questionnaire are voluntary. The information provided by the senior exit interview and questionnaires are compiled by the ABE Undergraduate Program Coordinator. The summary information is provided to the ABE Administration, the ABE Faculty Advisory Committee and the ABE Course and Curriculum Committee. The information is used to review the program educational objectives.

Alumni surveys also are used. ABE alumni are surveyed after graduation at 2, 5 and 10

year intervals post-graduation. A survey form is sent to each available alumnus via electronic media. Completed forms are compiled in a summary format. The information is available to the ABE faculty, administration and Courses and Curriculum Committee for reviewing the objectives.

Feedback from employers is provided by the ABE External Advisory Committee and companies representatives that work with the senior design team projects. The ABE External Advisory Committee meets on an annual basis with ABE administration, students, faculty and staff. The Committee provides feedback relative to PEOs as part of a committee report. This report is provided to faculty, administration and staff as a written report and a discussion presentation. Companies sponsor the ABE senior industry linked design projects, and representatives from these companies provide feedback to students and faculty about students' preparedness upon completion of the projects. This information is considered very useful in assessing and reviewing the program educational objectives.

Alumni surveys also are used to assess involvement of ABE graduates in the ABE profession. Participation in professional meetings and conferences is not formally assessed, but efforts are made on behalf of the ABE department to connect with graduates in professional activities through departmental sponsored receptions at annual ASBAE International Meetings, local ASABE section meetings, the Grainger College of Engineering annual open house, College of ACES annual ExplorACES open house, an annual ABE@Illinois on-campus event for all alumni and annual homecoming activities in conjunction with university events. These activities are not formally assessed, but they are discussed by the ABE department relative to our program quality and program educational objectives. NA

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: <https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf>). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

Revised programs [Agricultural and Biological Engineering BS Side by Side.xlsx](#)

Attach a side-by-side comparison with the existing program AND, if the revision references or adds "chose-from" lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.

Text for Overview tab on the Catalog Page. This is not official content, it is used to help build the new catalog page for the program. Can be edited in the catalog by the college or department.

Statement for Programs of Study Catalog

Graduation Requirements

Minimum Overall GPA: 2.0

Minimum hours required for graduation: 128 hours

General education: Students must complete the Campus General Education requirements including the campus general education language requirement. One of the SBS courses must be an introductory economics course (ECON 102 ~~(ECON 102~~ or ECON 103 ~~ECON 103~~ or ACE 100). ~~ACE 100). Specific Advanced Composition course required for this degree is listed below.~~ ABE 469 will satisfy a technical core course ~~Orientation~~ and the Campus General Education Advanced Composition requirement.

Orientation ~~Professional Development Foundational Mathematics~~ and Professional Development

Course List

Code	Title	Hours
<u>ABE 100</u>	Intro Agric & Biological Engrg	1
<u>ENG 100</u>	Grainger Engineering Orientation Seminar (External transfer students take <u>ENG 300</u> .)	1
Total Orientation Hours:		±
Total Hours		2

Foundational Mathematics ~~Science Agricultural and~~ Science

Course List

Code	Title	Hours
<u>CHEM 102</u>	General Chemistry I	3
<u>CHEM 103</u>	General Chemistry Lab I	1
<u>CHEM 104</u>	General Chemistry II	3
<u>CHEM 105</u>	General Chemistry Lab II	1
<u>MATH 221</u>	Calculus I (<u>MATH 220</u> may be substituted. <u>MATH 220</u> is appropriate for students with no background in calculus. 4 of 5 credit hours count towards degree.)	4
MATH 225	Introductory Matrix Theory	2
<u>MATH 231</u>	Calculus II	3
<u>MATH 241</u>	Calculus III	4
<u>MATH 257</u>	<u>Linear Algebra with Computational Applications</u>	<u>3</u>
<u>MATH 285</u>	Intro Differential Equations	3

Code	Title	Hours
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
Total Foundational Mathematics and Science Hours:		34
Total Hours		33

Agricultural and Biological Engineering Technical Core

Course List

Code	Title	Hours
For Both Concentrations:		
ABE 141	ABE Principles: Biological	2
ABE 223	ABE Principles: Machine Syst	2
ABE 224	ABE Principles: Soil & Water	2
ABE 225	ABE Principles: Bioenvironment	2
ABE 226	ABE Principles: Bioprocessing	2
ABE 430	Project Management	2
ABE 469	Industry-Linked Design Project (satisfies the general education advanced composition requirement)	4
CS 101	Intro Computing: Engrg & Sci	3
ECE 205	Electrical and Electronic Circuits	3
SE 101	Engineering Graphics & Design	3
TAM 210	Introduction to Statics 4	2
or TAM 211 Statics		
TAM 211	Statics	3
TAM 212	Introductory Dynamics	3
Total Agricultural and Biological Engineering Technical Core Hours:		30
Total Hours		31

Concentration

Course List

Code	Title	Hours
<u>Student chooses 1 of 2 Concentrations listed below. 35-36</u>		
<u>Agricultural Engineering</u>		<u>35-36</u>
<u>Biological Engineering</u>		<u>35</u>

Free Electives

Course List

Code	Title	Hours
The Grainger College of Engineering Liberal Education course list, or additional courses from the campus General Education lists for Social and Behavioral Sciences or Humanities and the Arts 5		6
Free electives. Additional unrestricted course work, subject to certain exceptions as noted by the College, so that there are at least 128 credit hours earned toward the degree. 6		6
<u>Additional course work, subject to the Grainger College of Engineering restrictions to Free Electives, so that there are at least 128 credit hours earned toward the degree.</u>		<u>10-11</u>
Total Hours of Curriculum to Graduate		128
Electives		1-2
may be substituted, with four of the five credit hours applying toward the degree. MATH 220%7C is appropriate for students with no background in calculus.		

~~3~~ ~~ABE-469%7C~~ satisfies the general education advanced composition requirement. ~~45~~
~~The Grainger College of Engineering approved liberal education course list can be found here.~~ ~~6~~
~~The Grainger College of Engineering restrictions to free electives can be found here.~~

Corresponding Degree BS Bachelor of Science

Program Features

Academic Level Undergraduate

Does this major have transcripted concentrations? No

What is the typical time to completion of this program?
4 years

What are the minimum Total Credit Hours required for this program?
128

CIP Code 140301 - Agricultural Engineering.

Is This a Teacher Certification Program?
No

Will specialized accreditation be sought for this program?
No

Delivery Method

This program is available:

On Campus - Students are required to be on campus, they may take some online courses.

Admission Requirements

Desired Effective Admissions Term

Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.

Describe how critical academic functions such as admissions and student advising are managed.

Enrollment

Describe how this revision will impact enrollment and degrees awarded.

These changes will not impact enrollment.

Estimated Annual Number of Degrees Awarded

Year One Estimate

5th Year Estimate (or when
fully implemented)

What is the
matriculation
term for this
program?

Fall

Budget

Are there No
budgetary
implications for
this revision?

Will the program or revision require staffing (faculty, advisors, etc.)
beyond what is currently available?

No

Additional Budget
Information

Attach File(s)

Financial Resources

How does the unit intend to financially support this proposal?

Will the unit need to seek campus or other external resources?

No

Attach letters of
support

What tuition rate do you expect to charge for this program? e.g, Undergraduate Base
Tuition, or Engineering Differential, or Social Work Online (no dollar amounts
necessary)

Are you seeking a change in the tuition rate or differential for this
program?

No

Resource Implications

Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities?

No

Technology

Will the program need additional technology beyond what is currently available for the unit?

No

Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

Resources

For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/acknowledgement from faculty, students, and/or other impacted units as appropriate.

Attach File(s)

Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

These changes will not impact our faculty resources.

Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

There is no impact to the use of the Library collections, resources, and services.

EP Documentation

EP Control Number

EP.22.105

Attach Rollback/Approval Notices

[ep22105_response_from_sponsor_20220214.pdf](#)

This proposal requires HLC inquiry

No

DMI Documentation

Attach Final
Approval Notices

Banner/Codebook Name BS: Agr & Biol Engr -UIUC

Program Code: 10KP5163BS

Minor Code	Conc Code	Degree Code	BS	Major Code
5163				

Senate Approval
Date

Senate
Conference
Approval Date

BOT Approval
Date

IBHE Approval
Date

HLC Approval
Date

Effective Date:

Attached
Document
Justification for
this request

Program Reviewer **Brooke Newell (bsnewell) (01/05/22 3:01 pm):** Rollback: per discussion
Comments

KEY

GREEN HIGHLIGHT = Course addition or requirement replacement

RED HIGHLIGHT = Course to be removed from listed requirements.

Yellow Highlight - Revision to requirement

Current Program of Study

Graduation Requirements
Minimum Overall GPA: 2.0

Minimum hours required for graduation: 128 hours

General education: Students must complete the Campus General Education requirements including the campus general education language requirement. One of the SBS courses must be an introductory economics course (ECON 102 or ECON 103 or ACE 100). Specific Advanced Composition course required for this degree is listed below.

Orientation and Professional Development		
Code	Title	Hours
ABE 100	Intro Agric & Biological Engrg ¹	1
ENG 100	Engineering Orientation ¹	0
Total Orientation Hours:		1

Foundational Mathematics and Science		
Code	Title	Hours
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1
CHEM 104	General Chemistry II	3
CHEM 105	General Chemistry Lab II	1
MATH 221	Calculus I ²	4
MATH 225	Introductory Matrix Theory	2
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 285	Intro Differential Equations	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
Total Foundational Mathematics and Science Hours:		34

Agricultural and Biological Engineering Technical Core		
Code	Title	Hours
For Both Concentrations:		
ABE 141	ABE Principles: Biological	2
ABE 223	ABE Principles: Machine Syst	2
ABE 224	ABE Principles: Soil & Water	2
ABE 225	ABE Principles: Bioenvironment	2
ABE 226	ABE Principles: Bioprocessing	2
ABE 430	Project Management	2
ABE 469	Industry-Linked Design Project ³	4
CS 101	Intro Computing: Engrg & Sci	3
ECE 205	Electrical and Electronic Circuits	3
SE 101	Engineering Graphics & Design	3
TAM 210	Introduction to Statics ⁴	2
or TAM 211	Statics	
TAM 212	Introductory Dynamics	3
Total Agricultural and Biological Engineering Technical Core Hours:		30
Total Hours		60

Electives		
Code	Title	Hours
The Grainger College of Engineering Liberal Education course list, or additional courses from the campus General Education lists for Social and Behavioral Sciences or Humanities and the Arts. ⁵		6

New Program of Study

Graduation Requirements
Minimum Overall GPA: 2.0

Minimum hours required for graduation: 128 hours

General education: Students must complete the Campus General Education requirements including the campus general education language requirement. One of the SBS courses must be an introductory economics course (ECON 102 or ECON 103 or ACE 100). ABE 469 will satisfy a technical core course and the Campus General Education Advanced Composition requirement.

Orientation and Professional Development		
Code	Title	Hours
ABE 100	Intro Agric & Biological Engrg	1
ENG 100	Engineering Orientation (External transfer students take ENG 300)	1
Total Hours:		2

Foundational Mathematics and Science		
Code	Title	Hours
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1
CHEM 104	General Chemistry II	3
CHEM 105	General Chemistry Lab II	1
MATH 221	Calculus I (MATH 220 is appropriate for students with no background in calculus. 4 of 5 credit hours count toward degree.)	4
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 257	Linear Algebra with Computational Applications	3
MATH 285	Intro Differential Equations	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
Total Hours:		33

Agricultural and Biological Engineering Technical Core		
Code	Title	Hours
For Both Concentrations:		
ABE 141	ABE Principles: Biological	2
ABE 223	ABE Principles: Machine Syst	2
ABE 224	ABE Principles: Soil & Water	2
ABE 225	ABE Principles: Bioenvironment	2
ABE 226	ABE Principles: Bioprocessing	2
ABE 430	Project Management	2
ABE 469	Industry-Linked Design Project	4
CS 101	Intro Computing: Engrg & Sci	3
ECE 205	Electrical and Electronic Circuits	3
SE 101	Engineering Graphics & Design	3
TAM 211	Statics	3
TAM 212	Introductory Dynamics	3
Total Hours:		31

Concentration		Hours
Students choose one of two concentrations below		35-36
Agricultural Engineering		35-36
Biological Engineering		35

Free Electives		
Code	Title	Hours

Free electives. Additional unrestricted course work, subject to certain exceptions as noted by the College, so that there are at least 128 credit hours earned toward the degree.⁶ 6

Additional course work, subject to the Grainger College of Engineering restrictions to Free Electives, so that there are at least 128 credit hours earned toward the degree. 10-11

Total Hours of Curriculum to Graduate 128

Total Hours of Curriculum to Graduate 128

Footnotes

¹ [External transfer students take ENG 300 instead, MATH 220 may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.](#)
² [ANE 469 satisfies the general education advanced composition requirement.](#)
³ [The extra hour of credit for this course may be used to help meet free elective requirements.](#)
⁴ [The Grainger College of Engineering approved liberal education course list can be found here.](#)
⁵ [The Grainger College of Engineering restrictions to free electives can be found here.](#)
⁶

January 13, 2022

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from our college. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,



Germán Bollero, Interim Dean



COLLEGE OF APPLIED HEALTH SCIENCES

Office of the Dean
110 Huff Hall, MC-586
1206 S. Fourth St.
Champaign, IL 61820

January 25, 2022

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from our college. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

While I support the move to give your students more freedom in course selection, it is important to express my concern that discontinuing your Liberal Education requirement may negatively impact my college's finances by reducing the IUs generated from lower enrollments in AHS courses. As you know, the current budget model rewards colleges financially based on the number of registrants in courses. I am hopeful that your students and advisors will continue to view AHS courses as relevant and valuable when they are selecting electives.

Sincerely,

A handwritten signature in blue ink that reads "Cheryl Hanley-Maxwell".

Dean



College of Education

Undergraduate Student Academic Affairs Office
110 Education Building, MC-708
1310 S. Sixth St.
Champaign, IL 61820

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from our college. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

A handwritten signature in black ink that reads 'April Carter'.

Assistant Dean for Academic Affairs
College of Education | University of Illinois at Urbana-Champaign



UNIVERSITY OF
ILLINOIS
URBANA-CHAMPAIGN

College of Fine & Applied Arts

Office of the Dean
100 Architecture Building, MC-622
608 E. Lorado Taft Dr.
Champaign, IL 61820

21 December 2021

Rashid Bashir, Dean
306 Engineering Hall
1308 W. Green St.
M/C 266
Urbana, IL 61801

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from the College of Fine & Applied Arts. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

Kevin Hamilton
Dean and Professor



College of Liberal Arts & Sciences

2090 Lincoln Hall, MC-448
702 S. Wright St.
Urbana, IL 61801

December 20, 2021

Dear Dean Bashir,

Thank you for informing the College of LAS of the proposed removal of the Liberal Education requirement in all undergraduate programs in the Grainger College of Engineering. I understand that this requirement includes an extensive list of courses from which your students could choose some, many of which are from our college. Grainger Engineering students will continue to be welcome to take our courses formerly on your Liberal Education list as free electives after the removal of this requirement from their programs of study.

Sincerely,

A handwritten signature in black ink that reads 'Venetria K. Patton'.

Venetria K. Patton
Harry E. Preble Dean



UNIVERSITY OF
ILLINOIS
URBANA-CHAMPAIGN

College of Media

Office of the Dean
119 Gregory Hall, MC-462
810 S. Wright St.
Urbana, IL 61801

January 13, 2022

Rashid Bashir, Dean
The Grainger College of Engineering
306 Engineering Hall
1308 W. Green Street
Urbana, IL 61801

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from our college. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

Tracy Sulkin
Dean, College of Media



**Gies College
of Business**

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Office of the Dean
260 Wohlers Hall, 1206 S. 6th Street
Champaign, IL 61820
217.333.2747

December 13th, 2021

Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from Gies College of Business. Students from Grainger will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

Jeffrey R. Brown

Dean, Gies College of Business



UNIVERSITY OF
ILLINOIS
URBANA-CHAMPAIGN

School of Information Sciences

501 E. Daniel St., MC-493
Champaign, IL 61820-6211

February 3, 2022

Dean Rashid Bashir
306 Engineering Hall
1308 West Green Street
Urbana, IL 61801

Dear Rashid,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in the Grainger College of Engineering. I understand that this requirement included an extensive list of courses that Grainger Engineering students could choose from, including some from the iSchool. This letter acknowledges that Grainger Engineering students will continue to be able to enroll in courses as articulated and constrained in Course Explorer and formerly on your Liberal Education list as Free Electives, after the removal of this requirement.

Sincerely,

Eunice Santos
Professor and Dean



THE GRAINGER COLLEGE OF ENGINEERING

Department of Mechanical Science & Engineering
144 Sidney Lu Mechanical Engineering Building, MC-244
1206 W. Green St.
Urbana, IL 61801

16 December, 2021

Kent D. Rausch
Associate Professor
Agricultural and Biological Engineering

Dear Prof. Rausch,

The Department of Mechanical Science and Engineering will support the Department of Agricultural and Biological Engineering's request to allow B.S. degree students in your program to take TAM 211 instead of TAM 210, as part of their curriculum. We note that students from ABE will likely be accommodated in *the Spring semesters rather than Fall semesters*, where the enrollment is typically very large. Fall semester registration priority will continue to be given to MechSE students.

Sincerely,

A handwritten signature in black ink that reads 'Sanjiv Sinha'.

Sanjiv Sinha
Associate Head for Undergraduate Programs
Mechanical Science and Engineering

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN



Department of Physics
Loomis Laboratory of Physics
1110 West Green Street
Urbana, IL 61801-3080

Yann Chemla
Professor of Physics
Associate Head for Undergraduate Programs
Center for the Physics of Living Cells

Kent D. Rausch
Associate Professor
Agricultural and Biological Engineering
College of Agricultural, Consumer and Environmental Sciences
Grainger College of Engineering
University of Illinois at Urbana-Champaign
1304 West Pennsylvania Avenue
Urbana, IL 61801

December 16, 2021

Re: ABE curriculum revision

Dear Prof. Rausch,

As Associate Head for Undergraduate Programs in the Department of Physics, I write this letter to acknowledge and support the proposed curriculum revision for the Agricultural and Biological Engineering (ABE) program. The Physics department understands that ABE will discontinue requiring PHYS 213 "Univ. Physics: Thermal Physics" for its curriculum. PHYS 213 has a typical enrollment of 450-550 students and will not be impacted negatively by the loss of ABE students.

We continue to encourage interested ABE students to pursue a Physics minor, for which PHYS 213 can be used as a foundational core course.

Sincerely,

A handwritten signature in cursive script that reads "Yann Chemla".

Yann Chemla
Professor of Physics
Associate Head for Undergraduate Programs
Department of Physics
161 Loomis, University of Illinois at Urbana-Champaign
1110 W. Green St., Urbana, IL 61801

Cc: Matthias Grosse-Perdekamp

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Mathematics

273 Altgeld Hall, MC-382
1409 West Green Street
Urbana, IL 61801



Re: Use of Math 257 in ABE

The Mathematics Department, working with the Grainger College of Engineering, has recently created the course MATH 257, *Linear Algebra with Computational Applications*. Quoting from the justification of the approved proposal, “In the future, MATH 257 will replace the MATH 415 requirement in many science and engineering curricula.” With this in mind, the department would be pleased to have ABE replace their current requirement of Math 225 with MATH 257 in their programs. As the Mathematics department is reallocating instructional resources from both Math 225 and Math 415 to Math 257 as the need shifts, as it was expected that some programs would shift from 225 to 257, this will not cause any undue difficulties for Mathematics resources.

Sincerely

A handwritten signature in black ink that reads "Randy McCarthy". The signature is written in a cursive, flowing style.

Randy McCarthy
Professor of Mathematics
Dir of Undergraduate Studies in Math
rmccrthy@illinois.edu

telephone 217-333-3350 • fax 217-333-9576
email office@math.uiuc.edu • url <http://www.math.uiuc.edu/>

From: Hanley-Maxwell, Cheryl D <cherylh@illinois.edu>
Sent: Monday, February 14, 2022 3:57 PM
To: Miller, Nolan H <nmiller@illinois.edu>
Subject: RE: Senate Ed Pol - Re: change to Grainger Liberal Education requirement

That's fine. Thanks for asking

CHERYL D HANLEY-MAXWELL
Dean

University of Illinois at Urbana-Champaign
College of Applied Health Sciences
108 Huff Hall
1206 S Fourth | M/C 586
Champaign, IL 61820
217.333.2131 | cherylh@illinois.edu
www.ahs.illinois.edu
(217) 333-0404 (FAX)

Human kindness has never weakened the stamina or softened the fiber of a free people. A nation does not have to be cruel to be tough. -- President Franklin D. Roosevelt



Under the Illinois Freedom of Information Act any written communication to or from university employees regarding university business is a public record and may be subject to public disclosure.

From: Miller, Nolan H <nmiller@illinois.edu>
Sent: Monday, February 14, 2022 1:49 PM
To: Hanley-Maxwell, Cheryl D <cherylh@illinois.edu>
Subject: RE: Senate Ed Pol - Re: change to Grainger Liberal Education requirement

Dear Cheryl,

Thanks again for talking with me about the changes to the Grainger BS programs. I read the statement you sent to the committee today. The Chair would like to include it in the record that is forwarded to the Senate. Is it ok to include the email you sent below?

Thanks,

Nolan



NOLAN H MILLER

Daniel and Cynthia Mah Helle Professor in Finance | Department of Finance
Director, Center for Business and Public Policy
Gies College of Business | University of Illinois at Urbana-Champaign
217.244.2847 | nmiller@illinois.edu | <http://www.business.illinois.edu/nmiller>

Under the Illinois Freedom of Information Act any written communication to or from university employees regarding university business is a public record and may be subject to public disclosure.

From: Hanley-Maxwell, Cheryl D <cherylhm@illinois.edu>
Sent: Thursday, February 10, 2022 1:49 PM
To: Miller, Nolan H <nmiller@illinois.edu>
Subject: RE: Senate Ed Pol - Re: change to Grainger Liberal Education requirement

Hi Nolan –

I appreciate what Ed Pol does in juggling the interests and concerns of the various programs across the campus, while keeping the students in mind. I served on a committee like this at my previous institution and know that it all boils down to what is best for the students' learning. Thanks for reminding me of that.

Here is a statement: While the Grainger proposal has the potential to financially affect AHS, we want to affirm another college's right to control their program requirements and student experiences, ensuring the best possible outcomes for their students. As a result, AHS supports this proposal and hopes that Grainger advisors will recognize the valuable contribution AHS classes make to the education of their students and continue to encourage them to consider relevant and/or high interest classes in AHS.

Hope this works!

Cheryl

CHERYL D HANLEY-MAXWELL, PHD
Dean

University of Illinois at Urbana-Champaign
College of Applied Health Sciences
108 Huff Hall
1206 S Fourth | M/C 586
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217.333.2131 | cherylhm@illinois.edu
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