APPROVED BY SENATE
02/10/2020

Date Submitted: 01/13/20 11:56 am

Viewing: 5271 : Agricultural & Biological Engineering: Biological Engineering, BS

Last approved: 06/20/19 9:30 am

Last edit: 01/22/20 2:40 pm

Changes proposed by: Brooke Newell

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

In Workflow

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

Approval Path

1. 01/13/20 1:18 pm
   Deb Forgacs (dforgacs):
   Approved for U Program Review
2. 01/16/20 10:32 am
   Kent Rausch (krausch):
   Approved for 1741 Committee Chair
3. 01/17/20 1:39 pm
   Ronaldo Maghirang (ronaldom):
   Approved for 1741 Head
4. 01/17/20 1:56 pm
   Candy Deaville (candyd):

Approved for KP Dean
5. 01/17/20 1:57 pm
Anthony Yannarell (acyann):
Approved for KL Committee Chair
6. 01/21/20 11:36 am
Anna Ball (aball):
Approved for KL Dean
7. 01/21/20 12:21 pm
John Wilkin (jpwilkin):
Approved for University Librarian
8. 01/22/20 10:53 am
Kathy Martensen (kmartens):
Approved for Provost

History

1. Apr 9, 2019 by Deb Forgacs (dforgacs)
2. Jun 20, 2019 by Deb Forgacs (dforgacs)

Proposal Type

Proposal Type:
Concentration (ex. Dietetics)

This proposal is for a:
Revision

Proposal Title:

if this proposal is one piece of a multi-element change please include the other impacted programs here. *example: A BS revision with multiple concentration revisions*

Remove deactivated courses from electives list ~~Course Lists~~

EP Control Number	**EP.20.96_original**
Official Program Name	Agricultural & Biological Engineering: Biological Engineering, BS
Effective Catalog Term	Fall 2020
Sponsor College	Agr, Consumer, & Env Sciences
Sponsor Department	Agricultural & Biological Engr
Sponsor Name	
Sponsor Email	
College Contact	College Contact Email

Program Description and Justification

Justification for proposal change:

Updates for Academic Catalog 2020-21

Is this program interdisciplinary?

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.

College	Grainger College of Engineering
Department	Engineering Administration

Do you need to add an additional interdisciplinary relationship?

No

Corresponding Program(s):

Corresponding Program(s)
Agricultural & Biological Engineering, BS

Academic Level Undergraduate

Additional concentration notes (e.g., estimated enrollment, advising plans, etc.)

CIP Code

Is This a Teacher Certification Program?
No

Will specialized accreditation be sought for this program?

No

Enrollment

Describe how this revision will impact enrollment and degrees awarded.

Delivery Method

Is this program available on campus and online? **No**

This program is available:
On Campus

Budget

Are there budgetary implications for this revision? No

Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?
No

Additional Budget Information

Attach File(s)

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

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.

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.

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 this new program/proposed change result in the replacement of another program?

No

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

No

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

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).

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	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.

Catalog Page Text

Catalog Page Text: Description of program for the catalog page. This is not official content, it is used to help build the catalog pages for the program. Can be edited in the catalog by the college or department.

Statement for Programs of Study Catalog

Biological Engineering Concentration Requirements

Course List

Code	Title	Hours
ABE 341	Transport Processes in ABE	3
CHBE 321	Thermodynamics	4
CHEM 232	Elementary Organic Chemistry I 1	3
MCB 150	Molec & Cellular Basis of Life	4
Electives		
Biological and natural sciences electives chosen from a departmentally approved list of Biological and Natural Sciences Electives. Three of the six crdit hours must be at the 300 or 400 level		6
ANSC 100	Intro to Animal Sciences	4
ANSC 221	Cells, Metabolism and Genetics	3
ANSC 350	Cellular Metabolism in Animals	3
ANSC 363	Behavior of Domestic Animals	4
ANSC 400	Dairy Herd Management	3
ANSC 401	Beef Production	3
ANSC 402	Sheep Production	3
ANSC 403	Pork Production	3
ANSC 404	Poultry Science	3
ANSC 406	Zoo Animal Conservation Sci	3
ANSC 450	Comparative Immunobiology	4
ATMS 201	General Physical Meteorology	3
ATMS 307	Climate Processes	3
CHEM 233	**Elementary Organic Chem Lab I**	**2**
CHEM 312	Inorganic Chemistry	3
CHEM 332	Elementary Organic Chem II	4
CHEM 360	Chemistry of the Environment	3
CHEM 460	Green Chemistry	3 or 4
CPSC 112	Introduction to Crop Sciences	4
CPSC 261	Biotechnology in Agriculture	3
CPSC 265	Genetic Engineering Lab	3
CPSC 270	Applied Entomology	3
CPSC 352	Plant Genetics	4
CPSC 414	Forage Crops & Pasture Ecology	3
CPSC 415	Bioenergy Crops	3
CPSC 418	Crop Growth and Management	3

Code	Title	Hours
CPSC 431	Plants and Global Change	3
CPSC 437	Principles of Agroecology	3
CPSC 473	Mgmt of Field Crop Insects	3
FSHN 101	The Science of Food and How it Relates to You	3
FSHN 414	Food Chemistry	3
FSHN 416	Food Chemistry Laboratory	3
FSHN 461	Food Processing I	4
FSHN 471	Food & Industrial Microbiology	3
GEOL 107	Physical Geology	4
GEOL 380	Environmental Geology	4
HORT 100	Introduction to Horticulture	3
HORT 341	Greenhouse Mgmt and Production	4
HORT 344	Planting for Biodiversity and Aesthetics	3
HORT 360	Vegetable Crop Production	3
HORT 361	Small Fruit Production	2
HORT 362	Tree Fruit Production	2
HORT 363	Postharvest Handling Hort Crop	2
HORT 421	Horticultural Physiology	4
HORT 435	Urban Food Production	3
IB 103	Introduction to Plant Biology	4
IB 150	Organismal & Evolutionary Biol	4
IB 151	Organismal & Evol Biol Lab	1
IB 203	Ecology	4
IB 329	Animal Behavior	3
IB 335	Plant Systematics	4
IB 411	Bioinspiration	3
IB 420	Plant Physiology	3
IB 439	Biogeography	3
IB 444	Insect Ecology	3 or 4
IB 452	Ecosystem Ecology	3
IB 482	Insect Pest Management	3
IB 485	Environ Toxicology & Health	3
IB 486	Pesticide Toxicology	3 or 4
MCB 100	Introductory Microbiology	3
MCB 101	Intro Microbiology Laboratory	2
MCB 244	Human Anatomy & Physiology I	3
MCB 245	Human Anat & Physiol Lab I	2
MCB 250	Molecular Genetics	3
MCB 251	Exp Techniqs in Molecular Biol	2
MCB 252	Cells, Tissues & Development	3
MCB 253	Exp Techniqs in Cellular Biol	2
MCB 300	Microbiology	3
MCB 301	Experimental Microbiology	3

Code	Title	Hours
MCB 314	Introduction to Neurobiology	3
MCB 316	Genetics and Disease	4
MCB 450	Introductory Biochemistry	3
NRES 201	Introductory Soils	4
NRES 219	Principles of Ecosystem Mgmt	3
NRES 348	Fish and Wildlife Ecology	3
NRES 351	Introduction to Environmental Chemistry	3
NRES 419	Env and Plant Ecosystems	3
NRES 420	Restoration Ecology	4
NRES 429	Aquatic Ecosystem Conservation	3
NRES 439	Env and Sustainable Dev	3
NRES 471	Pedology	3
NRES 475	Environmental Microbiology	3
NRES 487	Soil Chemistry	3
NRES 488	Soil Fertility and Fertilizers	3
PLPA 204	Introductory Plant Pathology	3
~~PLPA 401~~	~~Course PLPA 401 Not Found~~	
~~PLPA 402~~	~~Course PLPA 402 Not Found~~	
~~PLPA 402~~	~~Course PLPA 402 Not Found~~	
~~PLPA 404~~	~~Course PLPA 404 Not Found~~	
PLPA 405	Plant Disease Diagnosis & Mgmt	3
~~PLPA 406~~	~~Course PLPA 406 Not Found~~	
PLPA 407	Diseases of Field Crops	3
Technical electives chosen in consultation with an advisor. At least 8 hours must be Agricultural and Biological Engineering Technical Electives		15
ABE 361	Off-Road Machine Design	3
ABE 425	Engrg Measurement Systems	4
ABE 436	Renewable Energy Systems	3 or 4
ABE 446	Biological Nanoengineering	3 or 4
ABE 454	Environmental Soil Physics	3
ABE 455	Erosion and Sediment Control	2
ABE 456	Land & Water Resources Engrg	3 or 4
ABE 457	NPS Pollution Processes	2
ABE 458	NPS Pollution Modeling	2
ABE 459	Drainage and Water Management	3 or 4
ABE 463	Electrohydraulic Systems	3
ABE 466	Engineering Off-Road Vehicles	3
ABE 474	Indoor Environmental Control	3 or 4
ABE 476	Indoor Air Quality Engineering	4
ABE 482	Package Engineering	3

Code	Title	Hours
ABE 483	Engrg Properties of Food Matls	3
ABE 488	Bioprocessing Biomass for Fuel	3
BIOE 301	Introductory Biomechanics	3
BIOE 416	Biosensors	3
BIOE 461	Cellular Biomechanics	4
BIOE 467	Biophotonics	3
BIOE 473	Biomaterials Laboratory	3
BIOE 474	Metabolic Engineering	3 or 4
BIOE 476	Tissue Engineering	3
CHBE 221	Principles of CHE	3
CHBE 422	Mass Transfer Operations	4
CHBE 424	Chemical Reaction Engineering	3
CHBE 471	Biochemical Engineering	3 or 4
CHBE 472	Techniques in Biomolecular Eng	3 or 4
CHBE 473	Biomolecular Engineering	3 or 4
CHBE 475	Tissue Engineering	3
CHBE 476	Biotransport	3
CHBE 478	Bioenergy Technology	3
CEE 300	Behavior of Materials	4
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
CEE 430	Ecological Quality Engineering	2
CEE 432	Stream Ecology	3 or 4
CEE 434	Environmental Systems I	3
CEE 437	Water Quality Engineering	3
CEE 440	Fate Cleanup Environ Pollutant	4
CEE 442	Environmental Engineering Principles, Physical	4
CEE 443	Env Eng Principles, Chemical	4
CEE 444	Env Eng Principles, Biological	4
CEE 445	Air Quality Modeling	4
CEE 446	Air Quality Engineering	4
CEE 447	Atmospheric Chemistry	4
CEE 449	Environmental Engineering Lab	3
CEE 450	Surface Hydrology	3
CEE 451	Environmental Fluid Mechanics	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3

Code	Title	Hours
CEE 458	Water Resources Field Methods	4
CEE 461	Reinforced Concrete I	3
CEE 463	Reinforced Concrete II	3 or 4
CEE 465	Design of Structural Systems	3
CEE 470	Structural Analysis	4
CEE 480	Foundation Engineering	3
CEE 483	Soil Mechanics and Behavior	4
CEE 484	Applied Soil Mechanics	3 or 4
CS 466	Introduction to Bioinformatics	3 or 4
ECE 206	Electrical and Electronic Circuits Lab	1
ECE 333	Green Electric Energy	3
ECE 468	Optical Remote Sensing	3
ECE 470	Introduction to Robotics	4
ECE 481	Nanotechnology	4
ENG 471	Seminar Energy & Sustain Engrg	1
SE 320	Control Systems	4
SE 423	Mechatronics	3
IE 431	Design for Six Sigma	3
ME 320	Heat Transfer	4
ME 330	Engineering Materials	4
ME 340	Dynamics of Mechanical Systems	3.5
ME 370	Mechanical Design I	3
ME 371	Mechanical Design II	3
ME 400	Energy Conversion Systems	3 or 4
ME 402	Design of Thermal Systems	3 or 4
ME 403	Internal Combustion Engines	3 or 4
ME 461	Computer Cntrl of Mech Systems	3 or 4
ME 483	Mechanobiology	4
MSE 280	Engineering Materials	3
MSE 401	Thermodynamics of Materials	3
MSE 470	Design and Use of Biomaterials	3
MSE 473	Biomolecular Materials Science	3
MSE 474	Biomaterials and Nanomedicine	3
MSE 489	Matl Select for Sustainability	3 or 4
NPRE 201	Energy Systems	2 or 3
NPRE 470	Fuel Cells & Hydrogen Sources	3

Code	Title	Hours
NPRE 475	Wind Power Systems	3 or 4

1*May be taken for 4 credit hours; the extra hour may be used to help meet free elective requirements.*

EP Documentation

Attach Rollback/Approval Notices

DMI Documentation

Attach Final Approval Notices

Banner/Codebook Name
Biological Engineering

Program Code: 5271

Minor Code	Conc Code		Degree Code	Major Code
5163		5271		

Senate Approval Date

Senate Conference Approval Date

BOT Approval Date

IBHE Approval Date

Effective Date:

Attached Document

Justification for this request

Program Reviewer Comments

Kathy Martensen (kmartens) (01/13/20 11:54 am): Rollback: Email exchange.

Key: 733

Proposal	Degree	Footnote 1
EP.20.91	BS in Civil Engineering	External transfer students take ENG 300 instead
EP.20.92	BS in Computer Engineering	External transfer students take ENG 300 instead
EP.20.93	BSAG in Agricultural and Biological Engineering	In addition to the Biological and Natural Sciences Elective hours required for Agricultural and Biological Engineering (6 hours), a further 4 hours of biological sciences must be completed to make up a total of 10 hours.
EP.20.94	BS in Agricultural and Biological Engineering	External transfer students take ENG 300 instead
EP.20.95	BS in Agricultural and Biological Engineering: Agricultural Engineering	The extra hour of credit for this course may be used to help meet free elective requirements
EP.20.96	BS in Agricultural and Biological Engineering: Biological Engineering	May be taken for 4 credit hours; the extra hour may be used to help meet free elective requirements
EP.20.97	BS in Computer Science	External transfer students take ENG 300 instead
EP.20.98	BS in Electrical Engineering	External transfer students take ENG 300 instead
EP.20.99	BS in Engineering Mechanics	External transfer students take ENG 300 instead
EP.20.100	BS in Engineering Physics	External transfer students take ENG 300 instead
EP.20.101	BS in Systems Engineering & Design	External transfer students take ENG 300 instead
EP.20.102	BS in Nuclear, Plasma and Radiological Engineering	External transfer students take ENG 300 instead
EP.20.103	BS in Mechanical Engineering	External transfer students take ENG 300 instead
EP.20.104	BS in Materials Science & Engineering	External transfer students take ENG 300 instead
EP.20.105	BS in Industrial Engineering	External transfer students take ENG 300 instead