APPROVED BY SENATE
02/10/2020

EP.20.103_FINAL
Approved by EP 02/03/2020

Date Submitted: 01/09/20 3:00 pm

Viewing: 10KP0133BS : Mechanical Engineering, BS

Last approved: 08/12/19 8:35 am

Last edit: 01/22/20 3:11 pm

Changes proposed by: Brooke Newell

Catalog Pages Using this Program	Mechanical Engineering, BS

In Workflow

1. **U Program Review**
2. **1917 Head**
3. **KP Committee Chair**
4. **KP Dean**
5. **University Librarian**
6. **Provost**
7. **Senate EPC**
8. Senate
9. U Senate Conf
10. Board of Trustees
11. IBHE
12. DMI

Approval Path

1. 01/09/20 3:27 pm Deb Forgacs (dforgacs): Approved for U Program Review
2. 01/09/20 3:45 pm Sanjiv Sinha (sanjiv): Approved for 1917 Head
3. 01/10/20 8:45 am Michael Hirschi (mch): Approved for KP Committee Chair
4. 01/10/20 8:49 am Candy Deaville (candyd): Approved for KP Dean
5. 01/10/20 9:48 am John Wilkin (jpwilkin): Approved for

University Librarian
6. 01/13/20 11:32 am
Kathy Martensen (kmartens): Rollback to KP Committee Chair for Provost
7. 01/13/20 11:57 am
Michael Hirschi (mch): Approved for KP Committee Chair
8. 01/13/20 12:37 pm
Candy Deaville (candyd): Approved for KP Dean
9. 01/13/20 12:39 pm
John Wilkin (jpwilkin): Rollback to KP Dean for University Librarian
10. 01/13/20 1:25 pm
Candy Deaville (candyd): Approved for KP Dean
11. 01/13/20 3:07 pm
John Wilkin (jpwilkin): Approved for University Librarian
12. 01/22/20 11:56 am
Kathy Martensen (kmartens): Approved for Provost

History

1. Dec 13, 2018 by Deb Forgacs (dforgacs)
2. Apr 25, 2019 by Deb Forgacs (dforgacs)
3. Aug 12, 2019 by Deb Forgacs (dforgacs)

Proposal Type

Proposal Type:
Major (ex. Special Education)

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*

Removed deactivated course; updated gen ed and elective tables; ~~degree audit update.UG Lists.~~

EP Control Number	**EP.20.103_original**
Official Program Name	Mechanical Engineering, BS
Effective Catalog Term	Fall 2020
Sponsor College	Grainger College of Engineering
Sponsor Department	Mechanical Sci & Engineering
Sponsor Name	
Sponsor Email	
College Contact	College Contact Email

Program Description and Justification

Justification for proposal change:

Updates for Academic Catalog 2020-21

Corresponding Degree **BS Bachelor of Science**

Is this program interdisciplinary?

No

Academic Level Undergraduate

Will you admit to the concentration directly?

Is a concentration required for graduation?

CIP Code 141901 - Mechanical Engineering.

Is This a Teacher Certification Program?
No

Will specialized accreditation be sought for this program?

No

Admission Requirements

Desired 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.

None.

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

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.

None.

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.

None.

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

Will an existing tuition rate be used or continue to be used for this program?

Yes

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

Graduation Requirements

Minimum Technical GPA: 2.0

TGPA is required for required Engineering courses and any technical elective courses. See Technical GPA to clarify 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).

Orientation and Professional Development

Course List

Code	Title	Hours
ENG 100	Engineering Orientation 1	0
ME 290	Seminar	0
Total Hours		0

Foundational Mathematics and Science

Course List

Code	Title	Hours
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I 2	1
MATH 221	Calculus I 3	4
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 285	Intro Differential Equations 4	3
MATH 415	Applied Linear Algebra	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
Total Hours		29

Mechanical Engineering Technical Core

Course List

Code	Title	Hours
CS 101	Intro Computing: Engrg & Sci 5	3
ECE 205	Electrical and Electronic Circuits 6	3
ECE 206	Electrical and Electronic Circuits Lab	1
ME 170	Computer-Aided Design	3
ME 270	Design for Manufacturability	3
ME 200	Thermodynamics	3
ME 310	Fundamentals of Fluid Dynamics	4
ME 320	Heat Transfer	4
ME 330	Engineering Materials	4
ME 340	Dynamics of Mechanical Systems	3.5
ME 360	Signal Processing	3.5
ME 370	Mechanical Design I	3
ME 371	Mechanical Design II	3
ME 470	Senior Design Project	3

Code	Title	Hours
TAM 210	Introduction to Statics	2
TAM 212	Introductory Dynamics 7	3
TAM 251	Introductory Solid Mechanics	3
Total Hours		52

Technical Electives

Course List

Code	Title	Hours
Science elective(s), chosen from one of the following:		4
CHEM 104	General Chemistry II	
& CHEM 105	and General Chemistry Lab II 2	
MCB 150	Molec & Cellular Basis of Life	
PHYS 213	Univ Physics: Thermal Physics	
& PHYS 214	and Univ Physics: Quantum Physics	
Statistics elective, one course chosen from: 8		3
IE 300	Analysis of Data	
STAT 400	Statistics and Probability I	
MechSE electives chosen from a departmentally approved list. See list below		6
Technical electives chosen from a departmentally approved list below.		6
AE 352	Aerospace Dynamical Systems	3
AE 402	Orbital Mechanics	3 or 4
AE 403	Spacecraft Attitude Control	3 or 4
AE 410	Computational Aerodynamics	3 or 4
AE 412	Viscous Flow & Heat Transfer	4
AE 416	Applied Aerodynamics	3 or 4
AE 419	Aircraft Flight Mechanics	3 or 4
AE 420	Finite Element Analysis	3 or 4
AE 427	Mechanics of Polymers	3
AE 428	Mechanics of Composites	3
AE 433	Aerospace Propulsion	3 or 4
AE 434	Rocket Propulsion	3 or 4
AE 442	Aerospace Systems Design I	3
AE 443	Aerospace Systems Design II	3
AE 451	Aeroelasticity	3 or 4
AE 454	Systems Dynamics & Control	3 or 4
AE 456	Global Nav Satellite Systems	4
AE 460	Aerodynamics & Propulsion Lab	2
AE 461	Structures & Control Lab	2
AE 482	Introduction to Robotics	4
AE 483	**Unmanned Aerial Vehicle (UAV) Navigation and Control**	**3**
AE 497	Independent Study 9	1 to 4
AE 498	Special Topics (Depending on topic) 10	1 to 4
ABE 430	Project Management 11	2
ABE 436	Renewable Energy Systems	3 or 4
ABE 445	Statistical Methods	4
ABE 455	Erosion and Sediment Control	2

Code	Title	Hours
ABE 456	Land & Water Resources Engrg	3 or 4
ABE 459	Drainage and Water Management	3 or 4
ABE 463	Electrohydraulic Systems	3
ABE 466	Engineering Off-Road Vehicles	3
ABE 469	Industry-Linked Design Project	4
ABE 474	Indoor Environmental Control	3 or 4
ABE 476	Indoor Air Quality Engineering	4
ABE 483	Engrg Properties of Food Matls	3
ABE 488	Bioprocessing Biomass for Fuel	3
ABE 497	Independent Study 9	1 to 4
ABE 498	Special Topics 10	1 to 4
ASRM 410	Investments and Financial Markets	3 or 4
ASRM 461	Loss Models	3
ASRM 469	Casualty Actuarial Mathematics	3 or 4
ASRM 471	Life Contingencies I	4
ASRM 472	Life Contingencies II	3
BIOC 406	Gene Expression & Regulation	3
BIOC 440	Physical Chemistry Principles	4
BIOC 446	Physical Biochemistry	3
BIOC 455	Technqs Biochem & Biotech	4
BIOE 380	Biomedical Imaging	3
BIOE 414	Biomedical Instrumentation	3
BIOE 415	Biomedical Instrumentation Lab	2
BIOE 416	Biosensors	3
BIOE 461	Cellular Biomechanics	4
BIOE 473	Biomaterials Laboratory	3
BIOE 476	Tissue Engineering	3
BIOE 479	Cancer Nanotechnology	3
BIOE 481	Whole-Body Musculoskel Biomech	3 or 4
BIOE 482	Musculoskel Tissue Mechanics	3 or 4
BIOE 497	Individual Study 9	1 to 4
BIOE 498	Special Topics 10	1 to 4
BIOP 401	Introduction to Biophysics	3
BIOP 419	Brain, Behavior & Info Process	3
BIOP 432	Photosynthesis	3
CHBE 422	Mass Transfer Operations	4
CHBE 424	Chemical Reaction Engineering	3
CHBE 451	Transport Phenomena	3
CHBE 452	Chemical Kinetics & Catalysis	3
CHBE 453	Electrochemical Engineering	2 or 3
CHBE 456	Polymer Science & Engineering	3
CHBE 457	Microelectronics Processing	3
CHBE 471	Biochemical Engineering	3 or 4
CHBE 472	Techniques in Biomolecular Eng	3 or 4
CHBE 473	Biomolecular Engineering	3 or 4

Code	Title	Hours
CHBE 474	Metabolic Engineering	3 or 4
CHBE 475	Tissue Engineering	3
CHBE 476	Biotransport	3
CHEM 232	Elementary Organic Chemistry I	3 or 4
CHEM 233	Elementary Organic Chem Lab I	2
CHEM 236	Fundamental Organic Chem I	4
CHEM 237	Structure and Synthesis	2
CHEM 312	Inorganic Chemistry	3
CHEM 315	Instrumental Chem Systems Lab	2
CHEM 317	Inorganic Chemistry Lab	3
CHEM 332	Elementary Organic Chem II	4
CHEM 420	Instrumental Characterization	2
CHEM 436	Fundamental Organic Chem II	3
CHEM 437	Organic Chemistry Lab	3
CHEM 438	Advanced Organic Chemistry	3
CHEM 440	Physical Chemistry Principles	4
CHEM 442	Physical Chemistry I	4
CHEM 444	Physical Chemistry II	4
CHEM 445	Physical Principles Lab I	2
CHEM 447	Physical Principles Lab II	2
CHEM 450	Astrochemistry	4
CHEM 451	Astrochemistry Laboratory	3 or 4
CHEM 460	Green Chemistry	3 or 4
CHEM 472	Physical Biochemistry	3
CHEM 474	Drug Discovery & Development	3
CHEM 480	Polymer Chemistry	3 or 4
CHEM 482	Polymer Physics	3 or 4
CHEM 483	Solid State Structural Anlys	4
CHEM 488	Surfaces and Colloids	3 or 4
CHEM 497	Individual Study Senior 9	1 to 3
CEE 310	Transportation Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
CEE 398	Special Topics 10	0 to 4
CEE 401	Concrete Materials	4
CEE 405	Asphalt Materials I	3 or 4
CEE 406	Pavement Design I	3 or 4
CEE 407	Airport Design	3 or 4
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 411	RR Project Design & Constr	3 or 4

Code	Title	Hours
CEE 412	High-Speed Rail Engineering	3 or 4
CEE 415	Geometric Design of Roads	4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning 11	4
CEE 418	Public Transportation Systems	3 or 4
CEE 420	Construction Productivity	3 or 4
CEE 421	Construction Planning	3 or 4
CEE 422	Construction Cost Analysis	3 or 4
CEE 424	Sustainable Const Methods	4
CEE 430	Ecological Quality Engineering	2
CEE 434	Environmental Systems I	3
CEE 437	Water Quality Engineering	3
CEE 438	Science & Environmental Policy	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
CEE 458	Water Resources Field Methods	4
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 462	Steel Structures II	3 or 4
CEE 463	Reinforced Concrete II	3 or 4
CEE 465	Design of Structural Systems	3
CEE 467	Masonry Structures	3 or 4
CEE 468	Prestressed Concrete	3 or 4
CEE 469	Wood Structures	3 or 4
CEE 470	Structural Analysis	4
CEE 471	Structural Mechanics	3 or 4
CEE 472	Structural Dynamics I	3 or 4
CEE 480	Foundation Engineering	3
CEE 483	Soil Mechanics and Behavior	4
CEE 484	Applied Soil Mechanics	3 or 4
CEE 491	Decision and Risk Analysis	3 or 4
CEE 497	Independent Study 9	1 to 16
CEE 498	Special Topics 10	1 to 4
CS 225	Data Structures	4

Code	Title	Hours
CS 233	Computer Architecture	4
CS 241	System Programming	4
CS 242	Programming Studio	3
CS 357	Numerical Methods I	3
CS 374	Introduction to Algorithms & Models of Computation	4
CS 410	Text Information Systems	3 or 4
CS 411	Database Systems	3 or 4
CS 412	Introduction to Data Mining	3 or 4
CS 413	Intro to Combinatorics	3 or 4
CS 414	Multimedia Systems	3 or 4
CS 418	Interactive Computer Graphics	3 or 4
CS 419	Production Computer Graphics	3 or 4
CS 420	Parallel Progrmg: Sci & Engrg	3 or 4
CS 421	Programming Languages & Compilers	3 or 4
CS 422	Programming Language Design	3 or 4
CS 423	Operating Systems Design	3 or 4
CS 424	Real-Time Systems	3 or 4
CS 425	Distributed Systems	3 or 4
CS 426	Compiler Construction	3 or 4
CS 427	Software Engineering I	3 or 4
CS 428	Software Engineering II	3 or 4
CS 429	Software Engineering II, ACP	3
CS 431	Embedded Systems	3 or 4
CS 433	Computer System Organization	3 or 4
CS 436	Computer Networking Laboratory	3 or 4
CS 438	Communication Networks	3 or 4
CS 439	Wireless Networks	3 or 4
CS 440	Artificial Intelligence	3 or 4
CS 445	Computational Photography	3 or 4
CS 446	Machine Learning	3 or 4
CS 447	Natural Language Processing	3 or 4
CS 450	Numerical Analysis	3 or 4
CS 457	Numerical Methods II	3
CS 460	Security Laboratory	3 or 4
CS 461	Computer Security I	4
CS 463	Computer Security II	3 or 4
CS 465	User Interface Design	3 or 4
CS 466	Introduction to Bioinformatics	3 or 4
CS 467	Social Visualization	3 or 4
CS 468	Tech and Advertising Campaigns	3
CS 473	Algorithms	4
CS 475	Formal Models of Computation	3 or 4
CS 476	Program Verification	3 or 4
CS 477	Formal Software Devel Methods	3 or 4
CS 481	Advanced Topics in Stochastic Processes & Applications	3 or 4

Code	Title	Hours
CS 483	Applied Parallel Programming	4
CS 484	Parallel Programming	3 or 4
CS 498	Special Topics 10	1 to 4
CSE 401	Numerical Analysis	3 or 4
CSE 402	Parallel Progrmg: Sci & Engrg	3 or 4
CSE 412	Numerical Thermo-Fluid Mechs	2 to 4
CSE 441	Introduction to Optimization	3 or 4
CSE 450	Computational Mechanics	3 or 4
CSE 451	Finite Element Analysis	3 or 4
CSE 461	Computational Aerodynamics	3 or 4
ECE 329	Fields and Waves I	3
ECE 330	Power Ckts & Electromechanics	3
ECE 333	Green Electric Energy	3
ECE 340	Semiconductor Electronics	3
ECE 342	Electronic Circuits	3
ECE 343	Electronic Circuits Laboratory	1
ECE 380	Biomedical Imaging	3
ECE 385	Digital Systems Laboratory	3
ECE 395	Advanced Digital Projects Lab	2 or 3
ECE 401	Signal and Image Analysis	4
ECE 402	Electronic Music Synthesis	3
ECE 403	Audio Engineering	3
ECE 408	Applied Parallel Programming	4
ECE 411	Computer Organization & Design	4
ECE 412	Microcomputer Laboratory	3
ECE 414	Biomedical Instrumentation	3
ECE 415	Biomedical Instrumentation Lab	2
ECE 416	Biosensors	3
ECE 417	Multimedia Signal Processing	4
ECE 418	Image & Video Processing	4
ECE 419	Security Laboratory	3 or 4
ECE 420	Embedded DSP Laboratory	2
ECE 422	Computer Security I	4
ECE 424	Computer Security II	3 or 4
ECE 425	Intro to VLSI System Design	3
ECE 428	Distributed Systems	3 or 4
ECE 431	Electric Machinery	4
ECE 432	Advanced Electric Machinery	3
ECE 435	Computer Networking Laboratory	3 or 4
ECE 437	Sensors and Instrumentation	3
ECE 438	Communication Networks	3 or 4
ECE 439	Wireless Networks	3 or 4
ECE 441	Physcs & Modeling Semicond Dev	3
ECE 444	IC Device Theory & Fabrication	4
ECE 447	Active Microwave Ckt Design	3

Code	Title	Hours
ECE 448	Artificial Intelligence	3 or 4
ECE 451	Adv Microwave Measurements	3
ECE 452	Electromagnetic Fields	3
ECE 453	Wireless Communication Systems	4
ECE 454	Antennas	3
ECE 455	Optical Electronics	3 or 4
ECE 456	Global Nav Satellite Systems	4
ECE 457	Microwave Devices & Circuits	3
ECE 458	Applic of Radio Wave Propag	3
ECE 459	Communications Systems	3
ECE 460	Optical Imaging	4
ECE 462	Logic Synthesis	3
ECE 463	Digital Communications Lab	2
ECE 464	Power Electronics	3
ECE 465	Optical Communications Systems	3
ECE 466	Optical Communications Lab	1
ECE 467	**Biophotonics**	**3**
ECE 468	Optical Remote Sensing	3
ECE 469	Power Electronics Laboratory	2
ECE 470	Introduction to Robotics	4
ECE 472	Biomedical Ultrasound Imaging	3
ECE 473	Fund of Engrg Acoustics	3 or 4
ECE 476	Power System Analysis	3
ECE 478	Formal Software Devel Methods	3 or 4
ECE 480	Magnetic Resonance Imaging	3 or 4
ECE 481	Nanotechnology	4
ECE 482	Digital IC Design	3
ECE 483	Analog IC Design	3
~~ECE 484~~	~~Course ECE 484 Not Found~~	
ECE 485	MEMS Devices & Systems	3
ECE 486	Control Systems	4
ECE 487	Intro Quantum Electr for EEs	3
ECE 488	Compound Semicond & Devices	3
ECE 489	Robot Dynamics and Control	4
ECE 490	Introduction to Optimization	3 or 4
ECE 491	Numerical Analysis	3 or 4
ECE 492	Parallel Progrmg: Sci & Engrg	3 or 4
ECE 493	Advanced Engineering Math	3 or 4
ECE 495	Photonic Device Laboratory	3
ECE 498	Special Topics in ECE 10	0 to 4
ECON 302	Inter Microeconomic Theory 11	3
SE 402	Comp-Aided Product Realization	3 or 4
SE 411	Reliability Engineering	3 or 4
SE 412	Nondestructive Evaluation	3 or 4
SE 413	Engineering Design Optimization	3 or 4

Code	Title	Hours
SE 420	Digital Control Systems	4
SE 422	Robot Dynamics and Control	4
SE 423	Mechatronics	3
SE 424	State Space Design for Control	3
SE 450	Decision Analysis I 11	3 or 4
~~SE 462~~	~~Course SE 462 Not Found~~	
SE 497	Independent Study 9	0 to 4
SE 498	Special Topics 10	1 to 4
IE 310	Deterministic Models in Optimization	3
IE 311	Operations Research Lab	1
IE 330	Industrial Quality Control	3
IE 340	Human Factors	4
IE 360	Facilities Planning and Design	3
IE 410	Advanced Topics in Stochastic Processes & Applications	3 or 4
IE 411	Optimization of Large Systems	3 or 4
IE 412	OR Models for Mfg Systems	3 or 4
IE 413	Simulation	3 or 4
IE 420	Financial Engineering	3 or 4
IE 430	Economic Found of Quality Syst	3 or 4
IE 431	Design for Six Sigma	3
IE 445	Human Performance and Cognition in Context 11	3 or 4
IE 497	Independent Study 9	1 to 4
IE 498	Special Topics 10	1 to 4
MATH 347	Fundamental Mathematics	3
MATH 357	Numerical Methods I	3
MATH 403	Euclidean Geometry	3 or 4
MATH 412	Graph Theory	3 or 4
MATH 413	Intro to Combinatorics	3 or 4
MATH 414	Mathematical Logic	3 or 4
MATH 417	Intro to Abstract Algebra	3 or 4
MATH 418	Intro to Abstract Algebra II	3 or 4
MATH 423	Differential Geometry	3 or 4
MATH 424	Honors Real Analysis	3
MATH 425	Honors Advanced Analysis	3
MATH 427	Honors Abstract Algebra	3
MATH 428	Honors Topics in Mathematics 10	3
MATH 432	Set Theory and Topology	3 or 4
MATH 442	Intro Partial Diff Equations	3 or 4
MATH 444	Elementary Real Analysis	3 or 4
MATH 446	Applied Complex Variables	3 or 4
MATH 447	Real Variables	3 or 4
MATH 448	Complex Variables	3 or 4
MATH 450	Numerical Analysis	3 or 4
MATH 453	Elementary Theory of Numbers	3 or 4
MATH 464	Statistics and Probability II	3 or 4

Code	Title	Hours
MATH 473	Algorithms	4
MATH 475	Formal Models of Computation	3 or 4
MATH 481	Vector and Tensor Analysis	3 or 4
MATH 482	Linear Programming	3 or 4
MATH 484	Nonlinear Programming	3 or 4
MATH 487	Advanced Engineering Math	3 or 4
MATH 489	Dynamics & Differential Eqns	3 or 4
MATH 490	Advanced Topics in Mathematics 10	1 to 4
MATH 492	Undergraduate Research in Math 9	1 to 3
MCB 401	Cell & Membrane Physiology	3
MCB 402	Sys & Integrative Physiology	3
MCB 403	Cell & Membrane Physiology Lab	1 or 2
MCB 404	Sys & Integrative Physiol Lab	1 to 2
MCB 450	Introductory Biochemistry	3
MCB 493	Special Topics Mol Cell Biol 10	1 to 4
~~All 400 level ME courses, except 470~~		
All 400 level ME courses, except 470 and potentially 497, 498 9,10		
MSE 304	Electronic Properties of Matls	3
MSE 307	Materials Laboratory I	3
MSE 308	Materials Laboratory II	3
MSE 401	Thermodynamics of Materials	3
MSE 402	Kinetic Processes in Materials	3
MSE 403	Synthesis of Materials	3
MSE 405	Microstructure Determination	3
MSE 406	Thermal-Mech Behavior of Matls	3
MSE 420	Ceramic Materials & Properties	3
MSE 421	Ceramic Processing	3 or 4
MSE 422	Electrical Ceramics	3
MSE 423	Ceramic Processing Laboratory	3
MSE 440	Mechanical Behavior of Metals	3
MSE 441	Metals Processing	3
MSE 442	Metals Laboratory	3
MSE 443	Design of Engineering Alloys	3
MSE 445	Corrosion of Metals	3 or 4
MSE 450	Polymer Science & Engineering	3 or 4
MSE 452	Polymer Laboratory	3
MSE 453	Plastics Engineering	3
MSE 454	Mechanics of Polymers	3
MSE 455	Macromolecular Solids	3
MSE 456	Mechanics of Composites	3
MSE 457	Polymer Chemistry	3 or 4
MSE 458	Polymer Physics	3 or 4
MSE 460	Electronic Materials I	3
MSE 461	Electronic Materials II	3
MSE 462	Electronic Materials Lab	3

Code	Title	Hours
MSE 466	Materials in Electrochem Syst	3
MSE 470	Design and Use of Biomaterials	3
MSE 472	Biomaterials Laboratory	3
MSE 473	Biomolecular Materials Science	3
MSE 474	Biomaterials and Nanomedicine	3
MSE 480	Surfaces and Colloids	3 or 4
MSE 481	Electron Microscopy	3 or 4
MSE 484	Composite Materials	3 or 4
MSE 485	Atomic Scale Simulations	3 or 4
MSE 487	Materials for Nanotechnology	3 or 4
MSE 488	Optical Materials	3 or 4
MSE 489	Matl Select for Sustainability	3 or 4
MSE 497	Independent Study 9	1 to 4
MSE 498	Special Topics 10	1 to 4
NPRE 402	Nuclear Power Engineering	3 or 4
NPRE 412	Nuclear Power Econ & Fuel Mgmt	3 or 4
NPRE 421	Plasma and Fusion Science	3
NPRE 423	Plasma Laboratory	2
NPRE 429	Plasma Engineering	3
NPRE 431	Materials in Nuclear Engrg	3
NPRE 435	Radiological Imaging	3
NPRE 441	Radiation Protection	4
NPRE 442	Radioactive Waste Management	3
NPRE 444	Nuclear Analytical Methods Lab	2 or 3
NPRE 446	Radiation Interact w/Matter I	3
NPRE 447	Radiation Interact w/Matter II	3
NPRE 448	Nuclear Syst Engrg & Design	4
NPRE 451	NPRE Laboratory	3
NPRE 455	Neutron Diffusion & Transport	4
NPRE 457	Safety Anlys Nucl Reactor Syst	3 or 4
NPRE 461	Probabilistic Risk Assessment	3 or 4
NPRE 470	Fuel Cells & Hydrogen Sources	3
NPRE 475	Wind Power Systems	3 or 4
NPRE 498	Special Topics 10	1 to 4
PHYS 330	Atmospheric Dynamics II	3
PHYS 401	Classical Physics Lab	3
PHYS 402	Light	3 or 4
PHYS 403	Modern Experimental Physics	4 or 5
PHYS 404	Electronic Circuits	4 or 5
PHYS 406	Acoustical Physics of Music	4
PHYS 427	Thermal & Statistical Physics	4
PHYS 435	Electromagnetic Fields I	3
PHYS 436	Electromagnetic Fields II	3
PHYS 460	Condensed Matter Physics	4
PHYS 466	Atomic Scale Simulations	3 or 4

Code	Title	Hours
PHYS 470	Subatomic Physics	4
PHYS 475	Introduction to Biophysics	3 or 4
PHYS 485	Atomic Phys & Quantum Theory	3
PHYS 486	Quantum Physics I	4
PHYS 487	Quantum Physics II	4
PHYS 496	Intro to Physics Research 11	3
PHYS 497	Individual Study 9	1 to 4
PHYS 498	Special Topics in Physics 10	1 to 4
STAT 409	Actuarial Statistics II	4
STAT 410	Statistics and Probability II	3 or 4
STAT 420	Methods of Applied Statistics	3 or 4
STAT 424	Analysis of Variance	3 or 4
STAT 425	Applied Regression and Design	3 or 4
STAT 426	Sampling and Categorical Data	3 or 4
STAT 428	Statistical Computing	3 or 4
STAT 429	Time Series Analysis	3 or 4
STAT 430	Topics in Applied Statistics 10	3 or 4
STAT 440	Statistical Data Management	3 or 4
STAT 443	Professional Statistics 11	3 or 4
STAT 448	Advanced Data Analysis	4
STAT 458	Math Modeling in Life Sciences	3 or 4
STAT 480	Data Science Foundations	3 or 4
~~All 400 level TAM courses, except 499~~		
All 400 level TAM courses, except 499 and potentially 497,498 9,10		
TE 461	Technology Entrepreneurship 11	3
TMGT 460	Business Process Modeling	3
TMGT 461	Tech, Eng, & Mgt Final Project	2
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 12		**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. 13		**6**
Total Hours of Curriculum to Graduate		**128**

1

2 *CHEM 103 requirement waived for students who received test-based credit (AP, IB, or proficiency) for CHEM 102, similarly CHEM 105 requirement waived for students who received test-based credit for CHEM 104. Students are still required to have 128 hours minimum to graduate.*

3 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.*

4 *MATH 284 may be substituted.*

5 *CS 125 or ECE 220 may be substituted.*

6 *ECE 110 and ECE 210 (or ECE 211) combined may be substituted.*

7 *Transfers and Physics minor/dual degree students may substitute PHYS 325.*

8 *Transfers and ECE minor/dual degree students may substitute ECE 313.*

9 *A maximum of 3 hours of independent/individual study courses may be used to satisfy the MechSE Elective or Technical Elective requirements.*

10 *Depending on the technical content, some Special Topics courses may not be approved for Technical Elective credit. Please provide a syllabus of the course to the Mechanical Science and Engineering Undergraduate Programs Office to request use of the course for Technical Elective credit prior to registering for the course.*

11 *Professional Elective course. No more than 3 hours of professional elective credit may be used to satisfy the Technical Electives requirements.*

12 *The Grainger College of Engineering approved liberal education course list can be found here. Note that these credit hours could carry the required cultural studies designation required for campus general education requirements.*

13 *The Grainger College of Engineering restrictions to free electives can be found here.*

~~Overview of Curricular Requirements The curriculum requires 128 hours for graduation and is organized as shown below.Orientation and Professional Development These courses introduce the opportunities and resources your college, department, and curriculum can offer you as you work to achieve your career goals.They also provide the skills to work effectively and successfully in the engineering profession.Foundational Mathematics and Science These courses stress the basic mathematical and scientific principles upon which the engineering discipline is based.Mechanical Engineering Technical Core These courses stress fundamental concepts and basic laboratory techniques that comprise the common intellectual understanding of mechanical engineering.Technical Electives The science electives augment the foundational science courses in an area of interest and preparation for later courses.The MechSE, statistics, and additional technical courses stress the rigorous analysis, design, and statistics principles practiced in mechanical engineering.General Education Requirements~~

~~Course List~~

~~Code~~	~~Title~~	~~Hours~~
~~A minimum of six courses is required, as follows:~~		~~18~~
~~ECON 102~~	~~Microeconomic Principles~~	~~3~~
~~or ECON 103~~	~~Macroeconomic Principles~~	
~~Social and Behavioral Sciences~~		~~3~~
~~Humanities & the Arts~~		~~6~~
~~The Grainger College of Engineering Liberal Education course list, or from the campus General Education lists for Social and Behavioral Sciences or Humanities and the Arts~~		~~6~~
~~Cultural Studies: Non-Western Cultures (1 course)~~		
~~Cultural Studies: U.S. Minorities Cultures (1 course)~~		
~~Cultural Studies: Western/Comparative Cultures (1 course)~~		

~~Non-Primary Language Requirement~~

~~Course List~~

~~Code~~	~~Title~~	~~Hours~~
~~Completion of the third semester or equivalent of a non-primary language is required. Completion of three years of a single language in high school satisfies this requirement.~~		~~0-9~~

~~University Composition These courses teach fundamentals of expository writing.~~

~~Course List~~

Code	Title	Hours
Choose one:		
RHET 105	Writing and Research	
CMN 111	Oral & Written Comm I	
& CMN 112	and Oral & Written Comm II	
ESL 111	Intro to Academic Writing I	
& ESL 112	and Intro to Academic Writing II	
ESL 115	Principles of Academic Writing	
Advanced Composition (satisfied by completing ME 470 in the Mechanical Engineering Technical Core)		
Free Electives		

Course List

Code	Title	Hours
Free Electives		
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
Total Hours of Curriculum to Graduate		128

EP Documentation

Attach
Rollback/Approval
Notices

DMI Documentation

Attach Final
Approval Notices

Banner/Codebook
Name
BS:Mechanical Engineerng -UIUC

Program Code: 10KP0133BS

Minor Code	Conc Code	Degree Code	BS Major Code
0133			

Senate Approval
Date

Senate
Conference
Approval Date

BOT Approval Date

IBHE Approval Date

Effective Date:

Attached Document

Justification for this request

Program Reviewer Comments

Deb Forgacs (dforgacs) (01/09/20 1:42 pm): Rollback: .
Kathy Martensen (kmartens) (01/13/20 11:32 am): Rollback: Email exchange.
John Wilkin (jpwilkin) (01/13/20 12:39 pm): Rollback: Please provide a statement regarding needs for library resources.

Key: 120

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