APPROVAL FORM FOR

DEGREE PROGRAMS

MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

College: Bagley College of Engineering **Department:** Mechanical Engineering

Contact Person: Christopher Barrett **Mail Stop:** 9552 **E-mail:** barrett@me.msstate.edu

Nature of Change: Minor Change **Date Initiated:** 11/18/2024 **Effective Date:** Fall 2025

Current Degree Program Name: Bachelor of Science

Major: Mechanical Engineering **Concentration:** n/a

New Degree Program Name: Bachelor of Science

Major: Mechanical Engineering **Concentration:** n/a

Summary of Proposed Changes:
Modification: The Department of Mechanical Engineering is proposing to modify our curriculum by replacing CSE 1233 Computer Programming with C with CSE 1263 Computer Programming with Python. The modification requested will allow the program to offer students to be introduced to computer programming using a programming language more applicable for the remainder of their classes and more likely to be translatable to industry.

Approved: **Date:**

Haitham El Kadiri Digitally signed by Haitham El Kadiri
Date: 2024.11.25 17:01:54 -06'00'

_Haitham E Kadiri_____
Department Head

Digitally signed by Dr. T.J. Jankun-Kelly
Date: 2025.01.09 11:19:39 -06'00'

Chair, College or School Curriculum Committee

ROBERT A. GREEN

09 JAN 2025

Dean of College or School

Chair, University Committee on Courses and Curricula

Chair, Graduate Council (if applicable)

Chair, Deans Council

Dana Pierschal

1/9/2025

Acad. Dean.

Degree Modification Proposal

1. **Catalog Description**
   No changes

2. **Curriculum Outline**
   Use the chart below to make modifications to an existing undergraduate degree outline. If any General Education (Core) course is acceptable in the category, please indicate by saying "any Gen Ed course". There is no need to type in the whole list. All deleted courses and information should be shown in *italics* and all new courses and information in **bold**. Include the course prefix, number, and title in both columns. Expand this table as needed.

CURRENT Degree Description	PROPOSED Degree Description
Degree: Bachelor of Science Major: Mechanical Engineering Concentration: n/a	Degree: Bachelor of Science Major: Mechanical Engineering Concentration: n/a
Mechanical Engineering is the application of science and mathematics to the design, development, and operation of mechanical and energy systems. Examples of these systems include mechanical devices ranging from simple linkages and gears to complex automated robots and energy systems ranging from basic water pumps to high-performance jet engines. Since the range of applications is so broad, virtually all industries employ Mechanical Engineers in various capacities. Some of the major areas of employment are the manufacturing, chemical, paper, aerospace, utility, construction, transportation, petroleum, electronics, and computer industries. The mission of the Department of Mechanical Engineering is to educate students in fundamental engineering principles, thus enabling the understanding of existing and next generation technologies relevant to research and engineering practice. All graduates will receive a broad education that will enable them to be successful in industry or academia, the profession and the community. To carry out this mission, the Mechanical Engineering faculty, with input from other constituencies, has established the following objectives that describe the expected accomplishments of graduates during the first few years following graduation: 1. Apply fundamental engineering knowledge, industry perspective and research skills to become experts or leaders within a chosen engineering career path. 2. Exhibit life-long learning and develop personal and teamwork skills in order to effectively solve real-life problems and clearly communicate their results. 3. Practice ethical responsibility and accountability in professional activities and actively participate in professional development.	Mechanical Engineering is the application of science and mathematics to the design, development, and operation of mechanical and energy systems. Examples of these systems include mechanical devices ranging from simple linkages and gears to complex automated robots and energy systems ranging from basic water pumps to high-performance jet engines. Since the range of applications is so broad, virtually all industries employ Mechanical Engineers in various capacities. Some of the major areas of employment are the manufacturing, chemical, paper, aerospace, utility, construction, transportation, petroleum, electronics, and computer industries. The mission of the Department of Mechanical Engineering is to educate students in fundamental engineering principles, thus enabling the understanding of existing and next generation technologies relevant to research and engineering practice. All graduates will receive a broad education that will enable them to be successful in industry or academia, the profession and the community. To carry out this mission, the Mechanical Engineering faculty, with input from other constituencies, has established the following objectives that describe the expected accomplishments of graduates during the first few years following graduation: 1. Apply fundamental engineering knowledge, **hands-on experience**, industry perspective, and research skills to become experts or leaders within a chosen engineering career path. 2. Exhibit life-long learning and develop personal and teamwork skills in order to effectively solve real-life problems and clearly communicate their results. 3. Practice ethical responsibility and accountability in professional activities and actively participate in professional development.

The Mechanical Engineering curriculum is designed to meet these objectives. The basic courses in mechanics, materials, thermodynamics, electrical engineering systems, and dynamics prepare the student for the comprehensive design courses in the senior year culminating in major design experiences in energy systems and in mechanical systems. Throughout the curriculum there is significant use of the computer to solve realistic engineering problems. All entering ME juniors are required to have a portable computer that they will use interactively in the classroom. The ME laboratory sequence stresses the planning, design, and operation of experiments. The curriculum also places a strong emphasis on technical communications. Senior technical electives allow the student to study particular areas of interest.

The Mechanical Engineering Program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

CURRENT CURRICULUM OUTLINE	Required Hours
English Composition	
EN 1103 English Composition I	3
EN 1113 English Composition II	3
Mathematics	
See Major Core	
Science	
See Major Core	
Humanities Elective	6
Fine Arts Elective	3
Social/Behavioral Science Elective	6
Major Core	
Math and Basic Science	
MA 1713 Calculus I	3
MA 1723 Calculus II	3
MA 2733 Calculus III	3
MA 2743 Calculus IV	*3*
MA 3113 Intro to Linear Algebra	3
MA 3253 Differential Equations I	3
CH 1213 Chemistry I	3
CH 1211 Investigations in Chemistry	1
CH 1223 Chemistry II	3
PH 2213 Physics I	3
PH 2223 Physics II	3
Engineering Topics	
IE 3913 Engineering Economy	3
EM 2413 Engineering Mechanics I	3
EM 2433 Engineering Mechanics II	3
EM 3313 Fluid Mechanics	3
EM 3213 Mechanics of Materials	3
ECE 3413 Introduction to Electronic Circuits	3

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The Mechanical Engineering Program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

PROPOSED CURRICULUM OUTLINE	Required Hours
English Composition	
EN 1103 English Composition I	3
EN 1113 English Composition II	3
Mathematics	
See Major Core	
Science	
See Major Core	
Humanities Elective	6
Fine Arts Elective	3
Social/Behavioral Science Elective	6
Major Core	
Math and Basic Science	
MA 1713 Calculus I	3
MA 1723 Calculus II	3
MA 2733 Calculus III	3
MA 2743 Calculus IV	3
MA 3113 Intro to Linear Algebra	3
MA 3253 Differential Equations I	3
CH 1213 Chemistry I	3
CH 1211 Investigations in Chemistry	1
CH 1223 Chemistry II	3
PH 2213 Physics I	3
PH 2223 Physics II	3
Engineering Topics	
IE 3913 Engineering Economy	3
EM 2413 Engineering Mechanics I	3
EM 2433 Engineering Mechanics II	3
EM 3313 Fluid Mechanics	3
EM 3213 Mechanics of Materials	3
ECE 3413 Introduction to Electronic Circuits	3

ME 1111 Introduction to Mechanical Engineering	1	ME 1111 Introduction to Mechanical Engineering	1
ME 2133 Modeling and Manufacturing	3	ME 2133 Modeling and Manufacturing	3
ME 3103 Exp Measurements and Techniques	3	ME 3103 Exp Measurements and Techniques	3
ME 3113 Engineering Analysis	3	ME 3113 Engineering Analysis	3
ME 3313 Heat Transfer	3	ME 3313 Heat Transfer	3
ME 3403 Mat for Mech Eng Design	3	ME 3403 Mat for Mech Eng Design	3
ME 3423 Mechanics of Machinery	3	ME 3423 Mechanics of Machinery	3
ME 3513 Thermodynamics I	3	ME 3513 Thermodynamics I	3
ME 3523 Thermodynamics II	3	ME 3523 Thermodynamics II	3
ME 3613 System Dynamics	3	ME 3613 System Dynamics	3
ME 4111 Professional Seminar	1	ME 4111 Professional Seminar	1
ME 4301 Thermo-Fluids Laboratory	1	ME 4301 Thermo-Fluids Laboratory	1
ME 4333 Energy Systems Design	3	ME 4333 Energy Systems Design	3
ME 4401 Solid Mechanics Laboratory	1	ME 4401 Solid Mechanics Laboratory	1
ME 4403 Machine Design	3	ME 4403 Machine Design	3
ME 4433 Capstone Design and Innovation	3	ME 4433 Capstone Design and Innovation	3
ME 4643 Intro to Vibrations and Controls	3	ME 4643 Intro to Vibrations and Controls	3
Technical Elective	9	Technical Elective	9
Oral Communication Requirement		Oral Communication Requirement	
Satisfied by ME 2133, ME 4433, and GE 3513		Satisfied by ME 2133, ME 4433, and GE 3513	
Writing Requirement		Writing Requirement	
GE 3513 Technical Writing	3	GE 3513 Technical Writing	3
Computer Literacy		Computer Literacy	
CSE 1233 Computer Programming with C (or equivalent programming course)	3	**CSE 1263 Computer Programming with Python**	3
Total Hours	128	Total Hours	128

3. **Justification and Student Learning Outcomes**

The program is requesting one (1) course replacement by replacing CSE 1233 Computer Programming with C with CSE 1263 Computer Programming with Python. The modification requested will allow the program to offer students to be introduced to computer programming using a programming language more applicable for the remainder of their classes and more likely to be translatable to industry.

Additionally, the Program Educational Objectives were updated to specifically reference hands-on experience based on feedback from our advisory board that this was a critical goal for our program and adoption by unanimous faculty vote.

Student Learning Outcomes

The one (1) course replacement will not affect the overall program learning objectives. The modifications in the program meet the standards of the Accreditation Board for Engineering and Technology, Inc. (ABET). ABET is the accreditation body for all engineering degree programs.

1. **Will this program change meet local, state, regional, and national educational and cultural needs? If so, please describe.**

   Yes. There is an ongoing need for students in STEM disciplines to have the ability to write computer code. Python has a lower learning barrier than C which should improve student's coding ability upon completion of the class and prepare them for greater success through the rest of the program and eventually in industry.

2. **Will this program change result in duplication in the System? If so, please describe.**

No.

3. **Will this program change/advance student diversity within the discipline? If so, please describe.**
   This change will have no foreseeable effect on student diversity.

4. **Will this program change result in an increase in the potential placement of graduates in MS, the Southeast, and the U.S.? If so, please describe.**
   There is a small possibility that engineering companies might be more likely to recruit our students because our curriculum requires them to learn Python. Some job descriptions for new graduate hires do mention Python or similar language proficiency as a requirement or benefit.

5. **Will this program change result in an increase in the potential salaries of graduates in MS, the Southeast, and the U.S.? If so, please describe.**
   No.

4. **Support**
   Letter Attached. Written and signed by the ME Undergraduate Curriculum Committee

5. **Effective Date**
   Fall 2025

6. **Contact Person**

   Christopher Barrett, Associate Professor
   (662) 325 7325
   barrett@me.msstate.edu

MISSISSIPPI STATE UNIVERSITY
JAMES WORTH BAGLEY COLLEGE OF ENGINEERING

DEPARTMENT OF
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November 18, 2024

To: University Committee on Course and Curricula:

Re: Addition of Technical Elective to ME Curriculum

The ME Undergraduate Curriculum Committee considered a proposal to update the ME curriculum by replacing Computer Programming with C (CSE 1233) with Computer Programming with Python (CSE 1263). The votes below from the members of the ME Undergraduate Curriculum Committee reflect their support for the proposal ME curriculum change.

Name and Title (Voting Members)	Signature
Kip Barrett, Associate Professor (chair)	Kip Barrett
Shane Brauer, Associate Clinical Professor	
Joonsik Hwang, Assistant Professor	
Wil Whittington, Associate Professor	
Alejandro Martinez-Castellon, Instructor	
Doyl Dickel, Assistant Professor	
Mohsen Azimi, Assistant Professor	
Qingqing Liu, Assistant Professor	

Please feel free to contact me with any questions or concerns.

Sincerely,

Christopher Barrett, Ph.D.
Associate Professor
Undergraduate Coordinator