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:** Aerospace Engineering

Contact Person: Rani Sullivan **Mail Stop:** 9549 **E-mail:** sullivan@ae.msstate.edu

Nature of Change: Degree Modification
Date Initiated: 07/02/2024
Effective Date: Fall 2025

Current Degree Program Name: Bachelor of Science in Aerospace Engineering

Major: Aerospace Engineering
Concentrations: Aeronautics and Astronautics

New Degree Program Name: Bachelor of Science in Aerospace Engineering (no change)

Major: Aerospace Engineering (no change)
Concentration: Aeronautics and Astronautics (no change)

Summary of Proposed Changes:

Please see Table 1
In summary, it includes the following.
1. Creat three (ASE 2711, ASE 3721, ASE 3731) laboratory courses to house all ASE laboratory experiments.
2. Creat ASE 4712 Capstone I and ASE 4722 Capstone II to provide undergraduate senior seminar experience and professional development training and workshops for current and emerging topics in the field of aerospace engineering.
3. Add CSE 1284 for a programming language and allowing students to select either the existing CSE 1233 Computer Programming in C or CSE 1284 Programming in Python in freshman semester I
4. Remove ECE 3413 *Intro to Electronic Circuits* and including the relevant material in ASE 2711, ASE 3721, and ASE 3731.
6. Change ASE 3243 *Aerospace Structural Analysis II to* a technical elective.
7. Creat ASE 4313 Introduction to Aerospace Propulsion for all ASE undergraduates and removing ASE 4413 Aircraft Propulsion (taken by aero-track ASE students) and ASE 4443 Spacecraft Propulsion (taken by astro-track ASE students).

Approved: Date:

Digitally signed by Rani Warsi Sullivan
Date: 2024.07.02 21:03:52 -05'00'

2 July 2024

Department Head

8/6/24

Director of Academic Quality

Digitally signed by Dr. T.J. Jankun-Kelly
Date: 2025.03.27 11:59:37 -05'00'

Chair, College or School Curriculum Committee

27 March 2025

Dean of College or School

Chair, University Committee on Courses and Curricula

Chair, Graduate Council(if applicable)

Chair, Deans Council

1. CATALOG DESCRIPTION

CURRENT Catalog Description	PROPOSED Catalog Description
Department Head: Professor Rani W. Sullivan Academic Coordinator: Ms. Machaunda Bush Office: 321 Walker Engineering Building	Department Head: Professor Rani W. Sullivan Academic Coordinator: Ms. Machaunda Bush Office: 321 Walker Engineering Building
The Department of Aerospace Engineering at Mississippi State University provides an accredited undergraduate curriculum with the mission of preparing students to enter the workplace as qualified entry-level aerospace engineers or to enter any aerospace engineering graduate program adequately prepared for advanced study. This mission is accomplished by a strong foundation in mathematics and physical and engineering sciences upon which student problem-solving and application skills are developed. The curriculum stresses analytical and communication skills, with particular emphasis placed on engineering design throughout the curriculum. A capstone design experience in the senior year provides the opportunity to integrate design, analytical, and problem-solving skills along with communication skills in a team environment that emulates aerospace engineering practice. The mission is accomplished by the following educational objectives, which describe the career and professional accomplishments we are preparing our graduates to achieve. Our graduates will: **Be involved in solving unstructured engineering problems** within their organization that will allow them to successfully advance in the engineering profession. **Be engaged in lifelong learning and pursue professional development** through actions such as persistent study of the current literature in the field, participation in graduate education, professional education or continuing education opportunities,	The Department of Aerospace Engineering at Mississippi State University provides an accredited undergraduate curriculum with the mission of preparing students to enter the workplace as qualified entry-level aerospace engineers or to enter any aerospace engineering graduate program adequately prepared for advanced study. This mission is accomplished by a strong foundation in mathematics and physical and engineering sciences upon which student problem-solving and application skills are developed. The curriculum stresses analytical and communication skills, with particular emphasis placed on engineering design throughout the curriculum. A capstone design experience in the senior year provides the opportunity to integrate design, analytical, and problem-solving skills along with communication skills in a team environment that emulates aerospace engineering practice. The mission is accomplished by the following educational objectives, which describe the career and professional accomplishments we are preparing our graduates to achieve. Our graduates will: **Be involved in solving unstructured engineering problems** within their organization that will allow them to successfully advance in the engineering profession. **Be engaged in lifelong learning and pursue professional development** through actions such as persistent study of the current literature in the field, participation in graduate education, professional education or continuing education opportunities,

attainment of professional licensure, or membership in professional societies. 3. **Be professionally and ethically responsible** to the profession, society, and the environment incumbent on an engineering professional. 4. **Collaborate successfully and positively** on multi-disciplinary, culturally-diverse teams in support of their organizational goals. 5. **Communicate effectively** in various settings and contexts by activities such as writing technical reports and peer-reviewed articles and presenting at technical interchanges. These objectives are accomplished in two different concentrations in the aerospace engineering curriculum, an aeronautics concentration and an astronautics concentration. The concentration in aeronautics focuses on the analysis and design of aircraft and other vehicles that operate primarily within the earth's atmosphere, and the concentration in astronautics focuses on the analysis and design of spacecraft and other vehicles that operate primarily outside the earth's atmosphere. A student in aerospace engineering will choose one of these two concentrations upon choosing the aerospace engineering major. The B. S. program in Aerospace Engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Aerospace and similarly named engineering programs.	attainment of professional licensure, or membership in professional societies. 3. **Be professionally and ethically responsible** to the profession, society, and the environment incumbent on an engineering professional. 4. **Collaborate successfully and positively** on multi-disciplinary, culturally-diverse teams in support of their organizational goals. 5. **Communicate effectively** in various settings and contexts by activities such as writing technical reports and peer-reviewed articles and presenting at technical interchanges. These objectives are accomplished in two different concentrations in the aerospace engineering curriculum, an aeronautics concentration and an astronautics concentration. The concentration in aeronautics focuses on the analysis and design of aircraft and other vehicles that operate primarily within the earth's atmosphere, and the concentration in astronautics focuses on the analysis and design of spacecraft and other vehicles that operate primarily outside the earth's atmosphere. A student in aerospace engineering will choose one of these two concentrations upon choosing the aerospace engineering major. The B. S. program in Aerospace Engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Aerospace and similarly named engineering programs.

2. **DESCRIPTION OF CHANGES**
Please see Table 1

Table 1. ASE Curriculum Description of Changes

CONCENTRATION			**Aeronautics**	**Astronautics**
Add	**Remove**	**Shift**		
CSE 1284			Allow students to select either CSE 1233 or CSE 1284	Allow students to select either CSE 1233 or CSE 1284
ASE 2711			ASE 2711 ASE Lab I will introduce students to lab methods and tools; this will include some of the experiments from ASE 4113	ASE 2711 ASE Lab I will introduce students to lab methods and tools; this will include some of the experiments from ASE 4113
ASE 3721			ASE 3721 ASE Lab II will have experiments from the current courses of ASE 4113 and ASE 4721. it will prepare students for the hands-on projects in the next semester courses of ASE 4343, ASE 4623, and ASE 3731	ASE 3721 ASE Lab II will have experiments from the current courses of ASE 4113 and ASE 4721. it will prepare students for the hands-on projects in the next semester courses of ASE 4343, ASE 4623, and ASE 3731
ASE 3731			ASE 3731 ASE Lab III will have experiments from ASE 4721 and prepare students for the hands-on portion of their design and capstone experience.	ASE 3731 ASE Lab III will have experiments from ASE 4721 and prepare students for the hands-on portion of their design and capstone experience.
ASE 4313			ASE 4313 Introduction to Aerospace Propulsion will include fundamental topics of aircraft and spacecraft propulsion and will be taken by all ASE students.	ASE 4313 Introduction to Aerospace Propulsion will include fundamental topics of aircraft and spacecraft propulsion and will be taken by all ASE students.
ASE 4712			ASE Capstone I will retain the senior seminar (capstone) from the original ASE 4113, but will include professional development opportunities for seniors.	ASE Capstone I will retain the senior seminar (capstone) from the original ASE 4113, but will include professional development opportunities for seniors.
ASE 4722			ASE Capstone II will retain the continuing senior seminar (capstone) from the original ASE 4721, but will include professional development opportunities for seniors.	ASE Capstone II will retain the continuing senior seminar (capstone) from the original ASE 4721, but will include professional development opportunities

Table 1. ASE Curriculum Description of Changes

CONCENTRATION			Aeronautics	Astronautics
Add	**Remove**	**Shift**		
				for seniors.
		EM 3313	EM 3313 offered earlier to satisfy prerequisites needed for the other courses that have been moved to an earlier semester.	EM 3313 offered earlier to satisfy prerequisites needed for the other courses that have been moved to an earlier semester.
		ASE 3313	ASE 3313 moved from junior spring semester to junior fall semester to accommodate the schedule for students in the astronautics concentration.	ASE 3313 will be required for students in the astro concentration to give a more broad view of ASE.
		GE 3513	GE 3513 moved up one semester to enable technical writing skills prior to the senior year, in which several reports are required.	GE 3513 moved up one semester to enable technical writing skills prior to the senior year, in which several reports are required.
		ASE 4343	ASE 4343 moved from senior fall semester to junior spring semester to allow for all concepts to be covered prior to senior semester capstone and design courses.	ASE 4343 moved from senior fall semester to junior spring semester to allow for all concepts to be covered prior to senior semester capstone and design courses.
		ASE 4623	ASE 4623 moved from senior fall semester to junior spring semester to allow for all concepts to be covered prior to senior semester capstone and design courses.	ASE 4623 moved from senior fall semester to junior spring semester to allow for all concepts to be covered prior to senior semester capstone and design courses.
		ASE 3813	ASE 3813 will be required for students in the aero concentration to give a more broad view of ASE.	ASE 3813 moved to senior fall semester to make its offering align with the aeronautics schedule.
		Electives	Electives moved from the freshman and sophomore semesters to balance semester hours.	Electives moved from the freshman and sophomore semesters to balance semester hours.
		Humanities	Humanities elective moved from sophomore spring semester to balance semester hours.	Humanities elective moved from sophomore spring semester to balance semester hours.

Table 1. ASE Curriculum Description of Changes

CONCENTRATION			Aeronautics	Astronautics
Add	**Remove**	**Shift**		
	ASE 3243		ASE 3243 Structural Analysis II covers energy methods and is more appropriate as a technical elective. Some of these methods have been covered in EM 3413 and EM 2433.	ASE 3243 Structural Analysis II covers energy methods and is more appropriate as a technical elective. Some of these methods have been covered in EM 3413 and EM 2433
	ECE 3413		ECE 3413 Intro to Electronic Circuits: relevant material from this course is currently covered in ASE 4113 and will be covered in ASE 2711	ECE 3413 Intro to Electronic Circuits: relevant material from this course is currently covered in ASE 4113 and will be covered in ASE 2711
	ASE 4113		ASE 4113 ASE Eng Lab I: Experiments in this lab course are being relocated to ASE 2711 and ASE 3721; the capstone or senior seminar will be kept in ASE 4712.	ASE 4113 ASE Eng Lab I: Experiments in this lab course are being relocated to ASE 2711 and ASE 3721; the capstone or senior seminar will be kept in ASE 4712.
	ASE 4721		ASE 4721 ASE Eng Lab II: experiments in this lab course are being relocated to ASE 3721 and ASE 3731; the continuing capstone or senior seminar will be kept in ASE 4722.	ASE 4721 ASE Eng Lab II: experiments in this lab course are being relocated to ASE 3721 and ASE 3731; the continuing capstone or senior seminar will be kept in ASE 4722.
	ASE 4413		ASE 4413 Aircraft Propulsion is being replaced by ASE 4313 Intro to Aerospace Propulsion. This course will cover fundamental topics of both aircraft and spacecraft propulsion.	
	ASE 4443			ASE 4443 Spacecraft Propulsion is being replaced by ASE 4313 Intro to Aerospace Propulsion. This course will cover fundamental topics of both aircraft and spacecraft propulsion.

3. PROPOSED CURRICULUM OUTLINE

A. Aeronautics Curriculum

CURRENT Degree Description		PROPOSED Degree Description	
Degree: Bachelor of Science Major: Aerospace Engineering Concentration: Aeronautics		Degree: Bachelor of Science Major: Aerospace Engineering Concentration: Aeronautics	
No change to degree description		No change to degree description	
No change to the concentration description		No change to the concentration description	
CURRENT CURRICULUM OUTLINE	Required Hours	**PROPOSED CURRICULUM OUTLINE**	Required Hours
English (General Education): EN 1103 English Composition I or EN 1163 Accelerated Composition I EN 1113 English Composition II or EN 1173 Accelerated Composition II	 3 3	English (General Education): EN 1103 English Composition I or EN 1163 Accelerated Composition I EN 1113 English Composition II or EN 1173 Accelerated Composition II	 3 3
Fine Arts (General Education): any Gen Ed course	3	Fine Arts (General Education):	3
Natural Sciences (2 labs required from Gen Ed): 6-8 hr **Satisfied by major core**		Natural Sciences (2 labs required from Gen Ed): 6-8 hr **Satisfied by major core**	
Extra Science (if appropriate)		Extra Science (if appropriate)	
Math (General Education): 6-9 hr **Satisfied by major core**		Math (General Education):6-9 hr **Satisfied by major core**	
Humanities (General Education): any Gen Ed courses	6	Humanities (General Education):	6
Social/Behavioral Sciences (Gen Ed): any Gen Ed courses	6	Social/Behavioral Sciences (Gen Ed):	6
Major Core Courses		**Major Core Courses**	
MA 1713 Calculus I[1]	3	MA 1713 Calculus I[1]	3
MA 1723 Calculus II[1]	3	MA 1723 Calculus II[1]	3
MA 2733 Calculus III[1]	3	MA 2733 Calculus III[1]	3
MA 2743 Calculus IV	3	MA 2743 Calculus IV	3
MA 3313 Intro to Linear Algebra[1]	3	MA 3313 Intro to Linear Algebra[1]	3
MA 3253 Differential Equations I[1]	3	MA 3253 Differential Equations I[1]	3
Math/Science Elective[2]	3	Math/Science Elective[2]	3
CH 1211 Investigations in Chemistry I	1	CH 1211 Investigations in Chemistry I	1
CH 1213 Chemistry I	3	CH 1213 Chemistry I	3
CSE 1233 Computer Programming with C	3	CSE 1233 Comp. Prog. with C **or** **CSE 1284**	3

PH 2213 Physics I[1]	3	PH 2213 Physics I[1]	3
PH 2223 Physics II[1]	3	PH 2223 Physics II[1]	3
		Engineering Topics:	
Engineering Topics:		ASE 1013 Introduction to Aerospace Engineering	3
ASE 1013 Introduction to Aerospace Engineering	3	ASE 2113 Intro to Aircraft and Spacecraft Perf.	3
ASE 2113 Intro to Aircraft and Spacecraft Perf.	3	**ASE 2711 Aerospace Lab I**	1
ASE 3233 Aerospace Structural Analysis I	3	ASE 3233 Aerospace Structural Analysis I	3
ASE 3243 Aerospace Structural Analysis II	3	**ASE 3313 Incompressible Aerodynamics**	3
ASE 3333 Aerothermodynamics	3	**ASE 3813 Introduction to Orbital Mechanics**	3
ASE 4113 Aerospace Engineering Laboratory I	3	ASE 3333 Aerothermodynamics	3
ASE 4123 Aerospace Controls	3	**ASE 3721 Aerospace Lab II**	1
ASE 4343 Compressible Aerodynamics	3	**ASE 3731 Aerospace Lab III**	1
ASE 4623 Aerospace Structural Design	3	ASE 4123 Aerospace Controls	3
ASE 4721 Aerospace Engineering Laboratory II	1	**ASE 4313 Intro to Aerospace Propulsion**	3
ECE 3413 Introduction to Electronic Circuits	3	ASE 4343 Compressible Aerodynamics	3
EG 1143 Graphics Communication	3	ASE 4623 Aerospace Structural Design	3
EM 2413 Engineering Mechanics I[1]	3	**ASE 4712 Aerospace Capstone I**	2
EM 2433 Engineering Mechanics II[1]	3	**ASE 4722 Aerospace Capstone II**	2
EM 3213 Mechanics of Materials[1]	3	EG 1143 Graphics Communication	3
EM 3313 Fluid Mechanics[1]	3	EM 2413 Engineering Mechanics I[1]	3
EM 3413 Vibrations	3	EM 2433 Engineering Mechanics II[1]	3
		EM 3213 Mechanics of Materials[1]	3
		EM 3313 Fluid Mechanics[1]	3
		EM 3413 Vibrations	3
Oral Communication Requirements: Satisfied by successful completion of ASE 4513/ASE 4523 or ASE 4533/ASE 4543, ASE 4623, ASE 4721 and GE 3513.		**Oral Communication Requirements:** Satisfied by successful completion of ASE 4513/ASE 4523 or ASE 4533/ASE 4543, ASE 4623, ASE 4712, ASE 4722, and GE 3513.	
Writing Requirement:		**Writing Requirement**:	
GE 3513 Technical Writing	3	GE 3513 Technical Writing	3
Computer Literacy: Satisfied by successful completion of ASE 1013, ASE 2113 and CSE 1233.		**Computer Literacy:** Satisfied by successful completion of ASE 1013, ASE 2113 and CSE 1233 or CSE 1284.	
Concentration Courses		**Concentration Courses**	
Aeronautics Concentration (ARO)		**Aeronautics Concentration (ARO)**	
ASE 3123 Aircraft Flight Dynamics	3	ASE 3123 Aircraft Flight Dynamics	3
ASE 3313 Incompressible Aerodynamics	3	ASE 4513 Aircraft Design I	3
ASE 4413 Aircraft Propulsion	3	ASE 4523 Aircraft Design II	3
ASE 4513 Aircraft Design I	3		
ASE 4523 Aircraft Design II	3		
		Technical Electives (select from):	6
Technical Electives (select from):	6	ASE 3823 Spacecraft Attitude Dynamics	
ASE 3813 Introduction to Orbital Mechanics		ASE 4443 Spacecraft Propulsion	
ASE 3823 Spacecraft Attitude Dynamics		ASE 4133 Automatic Control	
ASE 4443 Spacecraft Propulsion		ASE 4153 Advance Performance	
ASE 4133 Automatic Control		ASE 4163 Introduction to Flight Test Eng.	

ASE 4153 Advance Performance ASE 4163 Introduction to Flight Test Eng ASE 4223 Structural Dynamics ASE 4353 Combustion Theory and Modeling ASE 4423 Introduction to Computational Fluid Dynamics ASE 4433 Fundamentals of Numerical Grid Generation ASE 4553 Engineering Design Optimization ASE 4713 Introduction to Unmanned Aircraft Systems ASE 4813 Advanced Orbital Mechanics EM 4123 Introduction to the Finite Elements Method EM 4133 Mechanics of Composite Materials EM 4143 Engineering Design Optimization		ASE 4223 Structural Dynamics ASE 4353 Combustion Theory and Modeling ASE 4423 Introduction to Computational Fluid Dynamics ASE 4433 Fundamentals of Numerical Grid Generation ASE 4553 Engineering Design Optimization ASE 4713 Introduction to Unmanned Aircraft Systems ASE 4813 Advanced Orbital Mechanics EM 4123 Introduction to the Finite Elements Method EM 4133 Mechanics of Composite Materials EM 4143 Engineering Design Optimization	
Total Hours	**128**	**Total Hours**	**128**

[1] This course requires a minimum grade of C.
[2] The department maintains a list of pre-approved math/science electives on its website. Other courses may be selected upon approval of the department.

B. Astronautics Curriculum

CURRENT Degree Description		PROPOSED Degree Description	
Degree: Bachelor of Science Major: Aerospace Engineering Concentration: Astronautics		Degree: Bachelor of Science Major: Aerospace Engineering Concentration: Astronautics	
No change to degree description		No change to degree description	
No change to the concentration description		No change to the concentration description	
CURRENT CURRICULUM OUTLINE	Required Hours	**PROPOSED CURRICULUM OUTLINE**	Required Hours
English (General Education): EN 1103 English Composition I or EN 1163 Accelerated Composition I EN 1113 English Composition II or EN 1173 Accelerated Composition II	 3 3	English (General Education): EN 1103 English Composition I or EN 1163 Accelerated Composition I EN 1113 English Composition II or EN 1173 Accelerated Composition II	 3 3
Fine Arts (General Education): any Gen Ed course	3	Fine Arts (General Education):	3
Natural Sciences (2 labs required from Gen Ed): 6-8 hr **Satisfied by major core**		Natural Sciences (2 labs required from Gen Ed):6-8 hr **Satisfied by major core**	
Extra Science (if appropriate)		Extra Science (if appropriate)	
Math (General Education): 6-9 hr		Math (General Education):6-9 hr	

Satisfied by major core		Satisfied by major core	
Humanities (General Education): any Gen Ed courses	6	Humanities (General Education):	6
Social/Behavioral Sciences (Gen Ed): any Gen Ed courses	6	Social/Behavioral Sciences (Gen Ed):	6
Major Core Courses		**Major Core Courses**	
MA 1713 Calculus I[1]	3	MA 1713 Calculus I[1]	3
MA 1723 Calculus II[1]	3	MA 1723 Calculus II[1]	3
MA 2733 Calculus III[1]	3	MA 2733 Calculus III[1]	3
MA 2743 Calculus IV	3	MA 2743 Calculus IV	3
MA 3313 Intro to Linear Algebra[1]	3	MA 3313 Intro to Linear Algebra[1]	3
MA 3253 Differential Equations I[1]	3	MA 3253 Differential Equations I[1]	3
Math/Science Elective[2]	3	Math/Science Elective[2]	3
CH 1211 Investigations in Chemistry I	1	CH 1211 Investigations in Chemistry I	1
CH 1213 Chemistry I	3	CH 1213 Chemistry I	3
CSE 1233 Computer Programming with C	3	CSE 1233 Computer Programming with C **or**	3
PH 2213 Physics I[1]	3	**CSE 1284**	
PH 2223 Physics II[1]	3	PH 2213 Physics I[1]	3
		PH 2223 Physics II[1]	3
Engineering Topics:		**Engineering Topics:**	
ASE 1013 Introduction to Aerospace Eng.	3	ASE 1013 Introduction to Aerospace Engineering	3
ASE 2113 Intro to Aircraft and Spacecraft Perf.	3	ASE 2113 Intro to Aircraft and Spacecraft Perf.	3
ASE 3233 Aerospace Structural Analysis I	3	**ASE 2711 Aerospace Lab I**	1
ASE 3243 Aerospace Structural Analysis II	3	ASE 3233 Aerospace Structural Analysis I	3
ASE 3333 Aerothermodynamics	3	**ASE 3313 Incompressible Aerodynamics**	3
ASE 4113 Aerospace Engineering Laboratory I	3	**ASE 3813 Introduction to Orbital Mechanics**	3
ASE 4123 Aerospace Controls	3	ASE 3333 Aerothermodynamics	3
ASE 4343 Compressible Aerodynamics	3	**ASE 3721 Aerospace Lab II**	1
ASE 4623 Aerospace Structural Design	3	**ASE 3731 Aerospace Lab III**	1
ASE 4721 Aerospace Engineering Laboratory II	1	ASE 4123 Aerospace Controls	3
ECE 3413 Introduction to Electronic Circuits	3	**ASE 4313 Intro to Aerospace Propulsion**	3
EG 1143 Graphics Communication	3	ASE 4343 Compressible Aerodynamics	3
EM 2413 Engineering Mechanics I[1]	3	ASE 4623 Aerospace Structural Design	3
EM 2433 Engineering Mechanics II[1]	3	**ASE 4712 Aerospace Capstone I**	2
EM 3213 Mechanics of Materials[1]	3	**ASE 4722 Aerospace Capstone II**	2
EM 3313 Fluid Mechanics[1]	3	EG 1143 Graphics Communication	3
EM 3413 Vibrations	3	EM 2413 Engineering Mechanics I[1]	3
		EM 2433 Engineering Mechanics II[1]	3
		EM 3213 Mechanics of Materials[1]	3
		EM 3313 Fluid Mechanics[1]	3
		EM 3413 Vibrations	3
Oral Communication Requirements: Satisfied by successful completion of ASE 4513/ASE 4523 or ASE 4533/ASE 4543, ASE 4623, ASE 4721 and GE 3513.		**Oral Communication Requirements:** Satisfied by successful completion of ASE 4513/ASE 4523 or ASE 4533/ASE 4543, ASE 4623, ASE 4712, ASE 4722, and GE 3513.	
Writing Requirement: GE 3513 Technical Writing	3	**Writing Requirement**: GE 3513 Technical Writing	3
Computer Literacy: Satisfied by successful completion of ASE 1013, ASE 2113 and CSE 1233.		**Computer Literacy:** Satisfied by successful completion of ASE 1013, ASE 2113 and CSE 1233 or CSE 1284	

Concentration Courses		Concentration Courses	
Astronautics Concentration (ASO):		**Astronautics Concentration (ASO):**	
ASE 3813 Introduction to Orbital Mechanics	3	ASE 3823 Spacecraft Attitude Dynamics	3
ASE 3823 Spacecraft Attitude Dynamics	3	ASE 4533 Spacecraft Design I	3
ASE 4443 Spacecraft Propulsion	3	ASE 4543 Spacecraft Design II	3
ASE 4533 Spacecraft Design I	3		
ASE 4543 Spacecraft Design II	3		
		Technical Electives (select from):	
Technical Electives (select from):	6	ASE 3123 Aircraft Attitude Dynamics	6
ASE 3313 Incompressible Aerodynamics		ASE 4413 Aircraft Propulsion	
ASE 3123 Aircraft Attitude Dynamics		ASE 4133 Automatic Control	
ASE 4413 Aircraft Propulsion		ASE 4153 Advance Performance	
ASE 4133 Automatic Control		ASE 4163 Introduction to Flight Test Engineering	
ASE 4153 Advance Performance		ASE 4223 Structural Dynamics	
ASE 4163 Introduction to Flight Test Engineering		ASE 4353 Combustion Theory and Modeling	
ASE 4223 Structural Dynamics		ASE 4423 Introduction to Computational Fluid Dynamics	
ASE 4353 Combustion Theory and Modeling		ASE 4433 Fundamentals of Numerical Grid Generation	
ASE 4423 Introduction to Computational Fluid Dynamics		ASE 4553 Engineering Design Optimization	
ASE 4433 Fundamentals of Numerical Grid Generation		ASE 4713 Introduction to Unmanned Aircraft Systems	
ASE 4553 Engineering Design Optimization		ASE 4813 Advanced Orbital Mechanics	
ASE 4713 Introduction to Unmanned Aircraft Systems		EM 4123 Introduction to the Finite Elements Method	
ASE 4813 Advanced Orbital Mechanics		EM 4133 Mechanics of Composite Materials	
EM 4123 Introduction to the Finite Elements Method		EM 4143 Engineering Design Optimization	
EM 4133 Mechanics of Composite Materials			
EM 4143 Engineering Design Optimization			
Total Hours	**128**	**Total Hours**	**128**

[1] This course requires a minimum grade of C.
[2] The department maintains a list of pre-approved math/science electives on its website. Other courses may be selected upon approval of the department.

3. JUSTIFICATION AND LEARNING OUTCOMES

Overall, the curriculum is being updated/modified to provide a more current and uniform distribution of aerospace engineering topics, laboratory assignments, and projects without sacrificing the rigor of the program. This includes introducing laboratory courses during the sophomore and junior semesters, focusing capstone courses on undergraduate research seminars and professional development in the senior year and allowing more flexibility in the choice of technical electives. This will increase student preparation as technical skills will be developed throughout the curriculum coupled with professional development.

4. Effective Date

Fall 2025

5. Four-Letter Abbreviation

ASE. The department proposes no change.

6. Letter of Support

See attachment.

MISSISSIPPI STATE UNIVERSITY™
JAMES WORTH
BAGLEY
COLLEGE OF ENGINEERING

DEPARTMENT OF AEROSPACE ENGINEERING

Dr. Rani W. Sullivan
Professor & Department Head
Bill and Carolyn Cobb Chair
sullivan@ae.msstate.edu

6 February 2025

Dr. Andy Perkins
Chair, University Committee on Courses and Curricula
Mississippi State, MS 39762

Dear Dr. Perkins,
The Department of Aerospace Engineering (ASE) is submitting a curriculum modification. The table on the next page lists the changes and an explanation for each change. This letter is to certify that all ASE faculty members have reviewed and approve this ASE curriculum modification.

Sincerely,

Rani Sullivan
Rani Sullivan (Feb 6, 2025 09:23 CST)

Rani W. Sullivan, PhD
Professor and Department Head
Bill and Carolyn Cobb Chair

Vivek Khare	Vivek Khare Vivek Khare (Feb 6, 2025 10:41 CST)
Han-Gyu Kim	Han-Gyu Kim Han-Gyu Kim (Feb 7, 2025 06:53 CST)
Craig Merrett	Craig Merrett Craig Merrett (Feb 6, 2025 16:35 CST)
Timothy W. Moore	Timothy Moore Timothy Moore (Feb 6, 2025 09:32 CST)
Shreyas Narsipur	Shreyas Narsipur Shreyas Narsipur (Feb 6, 2025 16:31 CST)
Adrian Sescu	Adrian Sescu Adrian Sescu (Feb 6, 2025 20:21 CST)
Carmen Sescu	Carmen Sescu Carmen Sescu (Feb 6, 2025 11:08 CST)
Vilas Shinde	Vilas Shinde Vilas Shinde (Feb 6, 2025 09:41 CST)
Chuangchuang Sun	Chuangchuang Sun Chuangchuang Sun (Feb 6, 2025 09:21 CST)
Calvin R. Walker	Calvin R. Walker Calvin R. Walker (Feb 6, 2025 09:18 CST)
Andrew J. Walters	Andy Walters Andy Walters (Feb 6, 2025 09:59 CST)
Robert R. Wolz	Robert Wolz Robert Wolz (Feb 6, 2025 15:29 CST)

The following table summarizes the changes for the ASE Degree Modification.

CONCENTRATION			Aeronautics	Astronautics
Add	Remove	Shift		
CSE 1284			Allow students to select either CSE 1233 or CSE 1284	Allow students to select either CSE 1233 or CSE 1284
ASE 2711			ASE 2711 ASE Lab I will introduce students to lab methods and tools; this will include some of the experiments from ASE 4113	ASE 2711 ASE Lab I will introduce students to lab methods and tools; this will include some of the experiments from ASE 4113
ASE 3721			ASE 3721 ASE Lab II will have experiments from the current courses of ASE 4113 and ASE 4721 it will prepare students for the hands-on projects in the next semester courses of ASE 4343, ASE 4623, and ASE 3731	ASE 3721 ASE Lab II will have experiments from the current courses of ASE 4113 and ASE 4721. it will prepare students for the hands-on projects in the next semester courses of ASE 4343, ASE 4623, and ASE 3731
ASE 3731			ASE 3731 ASE Lab III will have experiments from ASE 4721 and prepare students for the hands-on portion of their design and capstone experience.	ASE 3731 ASE Lab III will have experiments from ASE 4721 and prepare students for the hands-on portion of their design and capstone experience.
ASE 4313			ASE 4313 Introduction to Aerospace Propulsion will include fundamental topics of aircraft and spacecraft propulsion and will be taken by all ASE students.	ASE 4313 Introduction to Aerospace Propulsion will include fundamental topics of aircraft and spacecraft propulsion and will be taken by all ASE students.
ASE 4712			ASE Capstone I will retain the senior seminar (capstone) from the original ASE 4113, but will include professional development opportunities for seniors.	ASE Capstone I will retain the senior seminar (capstone) from the original ASE 4113, but will include professional development opportunities for seniors.
ASE 4722			ASE Capstone II will retain the continuing senior seminar (capstone) from the original ASE 4721, but will include professional development activities for seniors.	ASE Capstone II will retain the continuing senior seminar (capstone) from the original ASE 4721, but will include professional development activities for seniors.
		EM 3313	EM 3313 offered earlier to satisfy prerequisites needed for the other courses that have been moved to an earlier semester.	EM 3313 offered earlier to satisfy prerequisites needed for the other courses that have been moved to an earlier semester.
		ASE 3313	ASE 3313 moved from junior spring semester to junior fall semester to accommodate the schedule for students in the astronautics concentration.	ASE 3313 will be required for students in the astro concentration to give a more broad view of ASE.
		GE 3513	GE 3513 moved up one semester to enable technical writing skills prior to the senior year, in which several reports are required.	GE 3513 moved up one semester to enable technical writing skills prior to the senior year, in which several reports are required.
		ASE 4343	ASE 4343 moved from senior fall semester to junior spring semester to allow for all concepts to be covered prior to senior semester capstone and design courses.	ASE 4343 moved from senior fall semester to junior spring semester to allow for all concepts to be covered prior to senior semester capstone and design courses
		ASE 4623	ASE 4623 moved from senior fall semester to junior spring semester to allow for all concepts to be covered prior to senior semester capstone and design courses.	ASE 4623 moved from senior fall semester to junior spring semester to allow for all concepts to be covered prior to senior semester capstone and design courses.
		ASE 3813	ASE 3813 will be required for students in the aero concentration to give a more broad view of ASE.	ASE 3813 moved to senior fall semester to make its offering align with the aeronautics schedule.
		Electives	Electives moved from the freshman and sophomore semesters to balance semester hours.	Electives moved from the freshman and sophomore semesters to balance semester hours.
		Humanities	Humanities elective moved from sophomore spring semester to balance semester hours.	Humanities elective moved from sophomore spring semester to balance semester hours.
	ASE 3243		ASE 3243 Structural Analysis II covers energy methods and is more appropriate as a technical elective. Some of these methods have been covered in EM 3413 and EM 2433.	ASE 3243 Structural Analysis II covers energy methods and is more appropriate as a technical elective. Some of these methods have been covered in EM 3413 and EM 2433
	ECE 3413		ECE 3413 Intro to Electronic Circuits: relevant material from this course is currently covered in ASE 4113 and will be covered in ASE 2711	ECE 3413 Intro to Electronic Circuits: relevant material from this course is currently covered in ASE 4113 and will be covered in ASE 2711
	ASE 4113		ASE 4113 ASE Eng Lab I: Experiments in this lab course are being relocated to ASE 2711 and ASE 3721; the capstone or senior seminar will be kept in ASE 4712.	ASE 4113 ASE Eng Lab I: Experiments in this lab course are being relocated to ASE 2711 and ASE 3721; the capstone or senior seminar will be kept in ASE 4712.
	ASE 4721		ASE 4721 ASE Eng Lab II: Experiments in this lab course are being relocated to ASE 3721 and ASE 3731; the continuing capstone or senior seminar will be kept in ASE 4722	ASE 4721 ASE Eng Lab II: Experiments in this lab course are being relocated to ASE 3721 and ASE 3731, the continuing capstone or senior seminar will be kept in ASE 4722.
	ASE 4413		ASE 4413 Aircraft Propulsion is being replaced by ASE 4313 Intro to Aerospace Propulsion. This course will cover fundamental topics of both aircraft and spacecraft propulsion.	
	ASE 4443			ASE 4443 Spacecraft Propulsion is being replaced by ASE 4313 Intro to Aerospace Propulsion. This course will cover fundamental topics of both aircraft and spacecraft propulsion.