

DOCUMENTS OF THE GENERAL FACULTY

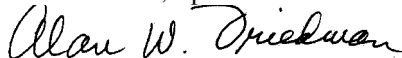
PROPOSED CHANGES TO THE AEROSPACE ENGINEERING DEGREE PROGRAM IN THE COCKRELL SCHOOL OF ENGINEERING CHAPTER IN THE *UNDERGRADUATE CATALOG 2018-2020*

Dean Sharon L. Wood in the Cockrell School of Engineering has filed with the Secretary of the Faculty Council the following proposal to change the Aerospace Engineering Degree Program in the Cockrell School of Engineering chapter in the *Undergraduate Catalog, 2018-2020*. The Aerospace Engineering faculty approved the proposal on May 11, 2017; the Degrees and Courses Committee approved it on May 24, 2017; the Dean and the College faculty approved it on September 18, 2017. The Secretary has classified this proposal as legislation of exclusive interest to one college or school.

The Committee on Undergraduate Degree Program Review recommended approval of the proposal on December 5, 2017, and forwarded it to the Office of the General Faculty. The Faculty Council has the authority to approve this legislation on behalf of the General Faculty. The authority to grant final approval on this legislation resides with the Texas Higher Education Coordinating Board.

If no objection is filed with the Office of the General Faculty by the date specified below, the legislation will be held to have been approved by the Faculty Council. If an objection is filed within the prescribed period, the legislation will be presented to the Faculty Council at its next meeting. The objection, with reasons, must be signed by a member of the Faculty Council.

To be counted, a protest must be received in the Office of the General Faculty by December 12, 2017.



Alan W. Friedman, Secretary of the General Faculty and Faculty Council
The University of Texas at Austin

Arthur J. Thaman and Wilhelmina Doré Thaman Professor of English and Comparative Literature

**PROPOSED CHANGES TO THE AEROSPACE ENGINEERING DEGREE PROGRAM IN THE
COCKRELL SCHOOL OF ENGINEERING CHAPTER IN THE *UNDERGRADUATE CATALOG 2018-
2020***

TYPE OF CHANGE: Academic Change
 Degree Program Change (THECB form required)

PROPOSED CLASSIFICATION: Exclusive General Major

1. IF THE ANSWER TO ANY OF THE FOLLOWING QUESTIONS IS YES, THE COLLEGE MUST CONSULT LINDA DICKENS, DIRECTOR OF ACCREDITATION AND ASSESSMENT, TO DETERMINE IF SACSCOC APPROVAL IS REQUIRED.

- | | | |
|--|------------------------------|--|
| • Is this a new degree program? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Is this program being deleted? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Does the program offer courses that will be taught off campus? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Will courses in this program be delivered electronically? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |

2. EXPLAIN CHANGE TO DEGREE PROGRAM AND GIVE A DETAILED RATIONALE FOR EACH INDIVIDUAL CHANGE:

Updated the ‘Portable Computing Devices’ section: 1) changed listed software to reflect the proper capitalization of the name of the software, 2) added additional software that is now a component of a required class, 3) added information about the need to access a remote server, and 4) updated the information about where to find minimum and required computing specifications.

Inventory updates (reflected in the ‘Requirements’ section, the ‘Technical Area Options’, and the ‘Suggested Arrangement of Courses’) already submitted for fall 2017 and spring 2018: 1) changed ASE 301 to COE 301 to reflect the content of the coursework that is actually Computational and not Aerospace-related; 2) changed the course title, and subsequently the course number, for ASE 370L, Flight Control Systems, to become ASE 370C, Feedback Control Systems, to reflect the content of the course that does not focus on ‘flight’, but more on ‘feedback control’; 3) changed ME 320 to ME 310T to reflect the inventory change that was completed by the Department of Mechanical Engineering in Fall 2016; 4) changed ASE 321K to COE 321K (in Area 1, Atmospheric Flight) to reflect the content of the coursework that is more Computational than Aerospace-related.

Inventory update (reflected in the ‘Requirements’ section, the ‘Technical Area Options’, and the ‘Suggested Arrangement of Courses’) to be submitted for fall 2018: 1) Change COE 211K (previously ASE 211K) to 311K (two-hour to three-hour) in order to reflect the actual coursework and teaching hours needed for the course content. This class establishes the foundation on numerical/mathematical methods for engineers. Many parts of the class are important prerequisite for other classes. Unfortunately, two-hour setting is not enough to cover all the subjects with sufficient depth. As a result, many of the important subjects such as cubic spline interpolation, or introductory numerical methods for ordinary differential equations and partial differential equations are left out or hardly covered. This becomes a burden for many students and instructors of future classes dependent on this content.

Removed ASE 365 and added ‘Structures elective’. After review by the undergraduate curriculum committee, taking into consideration various feedback from students and alumni of the program over the years, it was decided that ASE 365 (Structural Dynamics) is only necessary for students pursuing the Atmospheric flight technical area. For students pursuing the Space flight technical area, there was still a need for some instruction in structures, so these students will be given a choice of four different classes

(ASE 365, ASE 357, ASE or EM 339, or COE 321K) to fulfill this requirement. This change will allow a reduction in the frequency of offering ASE 365 and thus reduce the need for adjunct faculty to cover teaching load.

3. THIS PROPOSAL INVOLVES: (Please check all that apply)

- | | | |
|--|--|--|
| <input type="checkbox"/> Courses in other colleges | <input type="checkbox"/> Courses in proposer's college that are frequently taken by students in other colleges | <input type="checkbox"/> Flags |
| <input type="checkbox"/> Course in the core curriculum | <input type="checkbox"/> Change in course sequencing for an existing program | <input checked="" type="checkbox"/> Courses that have to be added to the inventory |
| <input type="checkbox"/> Change in admission requirements (external or internal) | <input type="checkbox"/> Requirements not explicit in the catalog language (e.g., lists of acceptable courses maintained by department office) | |

4. SCOPE OF PROPOSED CHANGE:

- a. Does this proposal impact other colleges/schools? Yes No
If yes, then how would you do so?
- b. Do you anticipate a net change in the number of students in your college? Yes No
If yes, how many more (or fewer) students do you expect?
- c. Do you anticipate a net increase (or decrease) in the number of students from outside of your college taking classes in your college? Yes No
If yes, please indicate the number of students and/or class seats involved.
- d. Do you anticipate a net increase (or decrease) in the number of students from your college taking courses in other colleges? Yes No
If yes, please indicate the number of students and/or class seats involved.

If 4 a, b, c, or d was answered with yes, please answer the following questions:

If the proposal has potential budgetary impacts for another college/school, such as requiring new sections or a non-negligible increase in the number of seats offered, at least one contact must be at the college-level.

How many students do you expect to be impacted?

Impacted schools must be contacted and their response(s) included:

Person communicated with:

Date of communication:

Response:

- e. Does this proposal involve changes to the core curriculum or other basic education requirements (42-hour core, signature courses, flags)? If yes, explain: **No**

If yes, Undergraduate Studies must be informed of the proposed changes and their response included:

Person communicated with:

Date of communication:

Response:

- f. Will this proposal change the number of hours required for degree completion? **Yes; from 126 to 127.**

Note: THECB Semester Credit Hour Change Form required, download from URL:

<http://www.thecb.state.tx.us/reports/DocFetch.cfm?DocID=2419&format=doc>

If yes, explain:

5. COLLEGE/SCHOOL APPROVAL PROCESS

Department approval date: May 12, 2017

Dr. Noel Clemens, Chair

	May 11, 2017	ASE/EM Faculty
	April 27, 2017	COE Undergraduate Curriculum Committee (section regarding change from COE 211K to COE 311K)
	April 20, 2017	ASE/EM Undergraduate Curriculum Committee
College approval date:	May 24, 2017	CSE Degrees & Courses Committee
Dean approval date:	Sept. 18, 2017	CSE Faculty; Sharon L. Wood, Dean

PROPOSED NEW CATALOG TEXT:**BACHELOR OF SCIENCE IN AEROSPACE ENGINEERING**

{No change up to this point}

Portable Computing Devices

Students entering aerospace engineering are required to have access to a portable computing device capable of running the software tools required for undergraduate engineering analyses (~~(MatLab]~~ MATLAB, SOLIDWORKS, Word, Excel, etc.) and accessing to the remote server for the department. This device does not need to be brought to campus on a daily basis, but individual courses may require that the device be brought to certain lectures, labs, and/or exams. ~~[Once admitted, students will be informed by the Aerospace Engineering and Engineering Mechanics Department office about specific device requirements.]~~ Minimum and recommended specifications may be found on the department website.

Curriculum

Course requirements include courses within the Cockrell School of Engineering and other required courses. In addition, each student must complete the University's Core Curriculum. In some cases, a course that fulfills one of the following requirements may also be counted toward Core Curriculum or flag requirements; these courses are identified below.

In the process of fulfilling engineering degree requirements, students must also complete coursework to satisfy the following flag requirements: one independent inquiry flag, one quantitative reasoning flag, one ethics and leadership flag, one global cultures flag, one cultural diversity in the United States flag, and two writing flags. The independent inquiry flag, the quantitative reasoning flag, the ethics and leadership flag, and both writing flags are carried by courses specifically required for the degree; these courses are identified below. Courses that may be used to fulfill flag requirements are identified in the *Course Schedule*.

Courses used to fulfill technical elective requirements must be approved by the aerospace engineering faculty before the student enrolls in them.

The student must take all courses required for the degree on the letter-grade basis and must earn a grade of at least C- in each course, except for those listed as Remaining Core Curriculum courses. He or she must also maintain grade point averages of at least 2.00 in the major area of study and in required technical courses as described in Academic Standards, and a cumulative University grade point average of at least 2.00 as described in *General Information*.

Requirements**Hours****Aerospace Engineering Courses**

ASE 120K	Low-Speed Aerodynamics Laboratory	1
[ASE 211K	Engineering Computation	2]
[ASE 301	Introduction to Computer Programming	3]
ASE 320	Low-Speed Aerodynamics	3

ASE 324L	Aerospace Materials Laboratory	3
ASE 330M	Linear System Analysis	3
ASE 333T	Engineering Communication (writing flag and ethics and leadership flag)	3
ASE 362K	Compressible Flow	3
[ASE 365	Structural Dynamics	3]
E M 306	Statics	3
E M 311M	Dynamics	3
E M 319	Mechanics of Solids	3
Mathematics		
M 408C	Differential and Integral Calculus (mathematics; quantitative reasoning flag)	4
M 408D	Sequences, Series, and Multivariable Calculus	4
M 427J	Differential Equations with Linear Algebra (quantitative reasoning flag)	4
or M 427K	Advanced Calculus for Applications I	
M 427L	Advanced Calculus for Applications II	4
Physics		
PHY 103M	Laboratory for Physics 303K	1
PHY 103N	Laboratory for Physics 303L	1
PHY 303K	Engineering Physics I (part I science and technology; quantitative reasoning flag)	3
PHY 303L	Engineering Physics II (part I science and technology; quantitative reasoning flag)	3
Rhetoric and Writing		
RHE 306	Rhetoric and Writing (English composition)	3
Other required courses		
Technical area courses		13
Approved technical electives		6
<u>Structures elective</u>		<u>3</u>
M E 210	Engineering Design Graphics	2
M E [320] 310T	Applied Thermodynamics	3
Remaining Core Curriculum Courses		
E 316L	British Literature (humanities; in E 316L, 316M, 316N, and 316P some sections carry a global cultures or cultural diversity flag)	3
or E 316M	<u>American Literature (humanities; some sections carry a global cultures or cultural diversity flag)</u>	
or E 316N	<u>World Literature (humanities; some sections carry a global cultures or cultural diversity flag)</u>	
or E 316P	<u>Masterworks of Literature (humanities; some sections carry a global cultures or cultural diversity flag)</u>	
American and Texas government (some sections carry a cultural diversity flag)		6
American history (some sections carry a cultural diversity flag)		6

Social and behavioral sciences (some sections carry a cultural diversity flag)	3
Visual and performing arts (some sections carry a cultural diversity flag)	3
UGS 302 First-Year Signature Course (in UGS 302 all sections carry writing flag[in UGS 303 some sections carry a writing flag])	3
or UGS 303 First-Year Signature Course (<u>in UGS 303 some sections carry a writing flag</u>)	
Total Hours	<u>127</u> 126

Technical Area Options

The technical area option allows the student to choose thirteen ~~[13]~~ semester hours of technical area courses in either atmospheric flight or space flight. Each student should choose a technical area by the end of the first semester of the junior year and plan an academic program to meet the area requirements in the next three semesters. Many students choose technical electives that will strengthen their backgrounds in one specialty area, but this is not required. It should be noted that a student may choose the technical area courses in the other technical area as technical electives.

Area 1, Atmospheric Flight

Also called aeronautics, this area provides the student with a well-rounded program of study emphasizing the major disciplines of aerodynamics, propulsion, structures, design, performance, and control of aircraft. These subjects are treated at a fundamental level that lays a foundation for work in a broad variety of specialties in the aircraft industry. This option is intended for the undergraduate student whose primary interest is aircraft.

~~[Aerospace]~~ Computational Engineering 321K, Computational Methods for Structural Analysis
 Aerospace Engineering 361K, *Aircraft Design I* (carries an independent inquiry flag)
 Aerospace Engineering 361L, *Aircraft Design II* (carries a writing flag)
 Aerospace Engineering 162M, *High-Speed Aerodynamics Laboratory*
 Aerospace Engineering 364, *Applied Aerodynamics*

Area 2, Space Flight

Also called astronautics, this area offers a well-rounded program of study that provides a background in the traditional areas of fluid mechanics, materials, structures, propulsion, controls, and flight mechanics, while also giving the student a chance to learn about the space environment, attitude determination and control, orbital mechanics, mission design, and spacecraft systems engineering. These subjects are treated at a fundamental level that lays a foundation for work in a broad variety of specialties in space-related industries. This option is intended for the undergraduate student whose primary interest is space and spacecraft.

Aerospace Engineering 366L, *Applied Orbital Mechanics*
 Aerospace Engineering 166M, *Spacecraft Systems Laboratory*
 Aerospace Engineering 372K, *Attitude Dynamics*
 Aerospace Engineering 374K, *Space Systems Engineering Design*
 Aerospace Engineering 374L, *Spacecraft/Mission Design* (carries an independent inquiry flag and a writing flag)

Structures Elective

The degree requires all students to take three semester hours of an approved structures elective.
Students pursuing Technical Area 1, Atmospheric Flight, must take Aerospace Engineering 365, Structural Dynamics, to fulfill this requirement.
Students pursuing Technical Area 2, Space Flight, will choose one of four options to fulfill this requirement:
Aerospace Engineering 365, Structural Dynamics
Aerospace Engineering 357, Mechanics of Composite Materials
Aerospace Engineering 339 or Engineering Mechanics 339, Advanced Strength of Materials, or
Computational Engineering 321K, Computational Methods for Structural Analysis.

Special Projects Laboratories

The department offers students the opportunity to participate in special projects such as student-built radio-controlled aircraft competitions and student satellite-building projects. These time-intensive projects are open to all aerospace engineering students with at least fifteen [~~15~~] semester hours of University credit toward the degree and a grade point average of at least 2.50. Academic credit for participation in departmentally approved student projects is available on the pass/fail basis through the course Aerospace Engineering 128. Three such laboratory courses can be combined to count as one three-hour technical elective; one such laboratory course can be combined with a two-hour cooperative program to count as one three-hour technical elective.

SUGGESTED ARRANGEMENT OF COURSES

First Year

First Term	Hours	Second Term	Hours
UGS 302 or 303	3	[ASE] COE 301	3
CH 301	3	M 408D	4
M 408C	4	PHY 303K	3
RHE 306	3	PHY 103M	1
Social and behavioral sciences or visual and performing arts	3	American and Texas government	3
		American history	3
	16		17

Second Year

First Term	Hours	Second Term	Hours
E M 306	3	[ASE] COE [244K] 311K	<u>32</u>
M 427J or 427K	4	E M 311M	3
PHY 303L	3	E M 319	3
PHY 103N	1	M 427L	4
M E 210	2	ASE 333T	3
M E 320 310T	3		
	16		<u>16</u> [15]

Third Year

First Term	Hours	Second Term	Hours
ASE 320	3	ASE 362K	3
ASE 120K	1	ASE 367K	3
ASE 330M	3	Social and behavioral sciences or visual and performing arts	3
[ASE 365] Structures Elective	3	Technical area courses	7
ASE 366K	3		
E 316L, 316M, 316N, or 316P	3		
	16		16

Fourth Year

First Term	Hours	Second Term	Hours
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15711

ASE 375	3	ASE 324L	3
ASE 376K	3	ASE [370L] <u>370C</u>	3
Technical area courses	6	American history	3
Technical elective	3	American and Texas government	3
		Technical area elective	3
	15		15
Total credit hours:			[126] <u>127</u>