

**TO:** The Faculty of the College of Engineering

**FROM:** School of Aeronautics and Astronautics of the College of Engineering

**RE:** Curriculum Change for the B.S. Degree in Aeronautical and Astronautical Engineering

The faculty of the School of Aeronautics and Astronautics has approved the following new changes in the curriculum for the B.S. degree in Aeronautical and Astronautical Engineering effective for students entering the School in the Fall Semester 2018. This action is now submitted to the Engineering Faculty with a recommendation for approval.

**New Requirements:** The requirement for nine credit hours of "Major Electives" has been changed to nine credit hours in an "Area of Concentration." The requirement for six credit hours in "Minor Electives" has been changed to six credit hours in "AAE Selective."

**Reason:** Currently, AAE students must take courses in "Major Electives" and "Minor Electives," and must choose a concentration in either Aeronautics or Astronautics. The present terminology is confusing and the requirements are unnecessarily burdensome; furthermore all students earn the exact same degree regardless of how they fulfill these requirements. The change to a nine hour requirement in an Area of Concentration and the elimination of the terms "Major" and "Minor" is a change in terminology that will eliminate confusion related to Major and Minor degree requirements. The change from "Minor Elective" to "AAE Selective" will allow students to have increased exposure to the growing breadth of topics in aerospace engineering. To further eliminate complications in the AAE curriculum, the distinction between an aeronautics track and an astronautics track is removed in the Plan of Study.

Approved for the faculty of the Schools  
of Engineering by the Engineering  
Curriculum Committee

ECC Minutes #3 Date 10-18-16  
Chairman ECC 

<b>Current</b>		<b>Proposed</b>
<b>Credit Hours Required for Graduation: 130</b>		<b>Credit Hours Required for Graduation: 130</b>
<b>Basic Program</b>	<b>Credit Hours</b>	<b>Basic Program</b>
		<b>Credit Hours</b>
<p><i>The basic B.S.AAE degree program has a minimum of 130 credit hours, including First-Year Engineering requirements. The required courses and the major and minor area courses cannot be taken on a pass/not-pass basis. Students must have a 2.0 GPA in the major, as well as overall, to graduate with a B.S.AAE degree. Divided into topical areas, the required curriculum is:</i></p>		
<b>Mathematics</b>		
Calculus: MA 16500, 16600, 26100	12	Calculus: MA 16500, 16600, 26100
Linear Algebra: MA 26500	3	Linear Algebra: MA 26500
Differential Equations: MA 26600, 30400	6	Differential Equations: MA 26600, 30400
<b>Sciences</b>		
Chemistry: CHM 11500	4	Chemistry: CHM 11500
Physics: PHYS 17200, 24100	7	Physics: PHYS 17200, 24100
<b>Communications, Humanities, and Social Sciences</b>		
English Composition	3	English Composition
Communications	3	Communications
<p><i>Note: students must take at least 3 credits of coursework focused on written and/or spoken communications at the 300 level or higher.</i></p>		
<b>General Education Electives</b>	<b>18</b>	<b>General Education Electives</b>
<p><i>Note: students must take at least 3 credits of coursework focused on written and/or spoken communications at the 300 level or higher.</i></p>		
<b>Computer Skills</b>		
Programming: CS 15900, ENGR 13200	5	Programming: CS 15900, ENGR 13200
Graphics: CGT 16300	2	Graphics: CGT 16300
<b>Professional Development</b>		
Undergraduate Seminar: AAE 20000, 30000, 40000	1	Undergraduate Seminar: AAE 20000, 30000, 40000
ENGR 13100	2	ENGR 13100
<p><i>Note: AAE 20000 will be taken once in the sophomore year, AAE 30000 once in the junior year and AAE 40000 once in the senior year.</i></p>		
<p><i>Note: AAE 20000 will be taken once in the sophomore year, AAE 30000 once in the junior year and AAE 40000 once in the senior year.</i></p>		

**Current**

**Aeronautics and Astronautics Program**

Structures and Materials: AAE 20400, 20401, 35200	7
Aerodynamics: AAE 33300, 33301, 33400	7
Lab Elective: AAE 35201 or 33401	1

*Note: The selected lab should be taken with the corresponding course, if possible.*

**Propulsion**

Thermodynamics: ME 20000	3
Aerospace Propulsion: AAE 33900	3
or	
Thermal Sciences: AAE 33800	

*Note: Students planning to specialize in propulsion will take AAE 33800 Thermal Sciences.*

**Dynamics and Control**

Statics and Dynamics: AAE 20300, 34000	6
Controls: AAE 30100, 36400, 36401	7

Vehicle Dynamics: AAE 42100 or 44000	3
--------------------------------------	---

*Note: Students planning to specialize in aeronautics should take AAE 42100; those aimed at astronautics should take AAE 44000. AAE 364001 is to be taken following AAE 36400.*

**Design**

Introduction: AAE 25100	3
Spacecraft: AAE 45000 or Aircraft: AAE 45100	3

*Note: Students planning to specialize in aeronautics should take AAE 45100; those aimed at astronautics should take 45000.*

<b>Major Electives</b>	9
<b>Minor Electives</b>	6

*Note: Major and minor electives are typically related specializations within aerospace engineering. They must be approved by the academic advisor.*

**Proposed**

**Aeronautics and Astronautics Program**

Structures and Materials: AAE 20400, 20401, 35200	7
Aerodynamics: AAE 33300, 33301, 33400	7
Lab Elective: AAE 35201 or 33401	1

*Note: The selected lab should be taken with the corresponding course, if possible.*

**Propulsion**

Thermodynamics: ME 20000	3
Aerospace Propulsion: AAE 33900	3
or	
Thermal Sciences: AAE 33800	

*Note: Students planning to specialize in propulsion will take AAE 33800 Thermal Sciences.*

**Dynamics and Control**

Statics and Dynamics: AAE 20300, 34000	6
Controls: AAE 30100, 36400, 36401	7

Vehicle Dynamics: AAE 42100 or 44000	3
--------------------------------------	---

*Note: Students planning to specialize in aeronautics should take AAE 42100; those aimed at astronautics should take AAE 44000. AAE 36401 is to be taken following AAE 36400.*

**Design**

Introduction: AAE 25100	3
Spacecraft: AAE 45000 or Aircraft: AAE 45100	3

*Note: Students planning to specialize in aeronautics should take AAE 45100; those aimed at astronautics should take 45000.*

<b>Major Concentration Area</b>	9
<b>AAE Selective</b>	6

*Note: Major concentration courses are typically related specializations within aerospace engineering. AAE Selective courses are typically electives within AAE. Major concentration areas and AAE Selective must be approved by the academic advisor.*

**Current**

**Technical Electives**

*Note: Technical electives may be chosen from a broad range of science, engineering, or technology courses, subject to approval from the academic advisor.*

*Note: Students must take 3 credits of coursework focused on economics, business, or entrepreneurship - subject to approval by the academic advisor. This may be covered either in the general education or technical electives and, therefore, need not increase the credits to graduate.*

*Total*

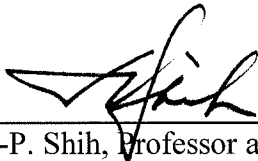
**Proposed**

**Technical Electives**

6 *Note: Technical electives may be chosen from a broad range of science, engineering, or technology courses, subject to approval from the academic advisor.* 6

*Note: Students must take 3 credits of coursework focused on economics, business, or entrepreneurship - subject to approval by the academic advisor. This may be covered either in the general education or technical electives and, therefore, need not increase the credits to graduate.*

130 *Total* 130



---

Tom I-P. Shih, Professor and Head  
School of Aeronautics and Astronautics

**Current**

**Suggested Plan of Study for Aeronautical and Astronautical Engineering:**

**Credit Hours Required for Graduation: 130**

**Freshman Year**, see First-Year Engineering: 32 **CGT 16300** is required in the aeronautical and astronautical engineering curriculum.

Students planning to enter AAE are encouraged to take computer programming as the Science Selective

**Sophomore Year  
Third Semester**

(3)	AAE	20300	Aeromechanics
(0)	AAE	20000	Undergraduate Sophomore Seminar
(4)	MA	26100	Multivariate Calc.
(3)	MA	26500	Linear Algebra
(3)	PHYS	24100	Electricity and Optics <b>or</b>
	AAE	25100	Intro. to Aerospace Design
(3)	General Education Elective		
(16)	Total		

**Fourth Semester**

(3)	AAE	20400	Aeromechanics II
(1)	AAE	20401	Aeromechanics II Lab
(3)	PHYS	24100	Electricity and Optics <b>or</b>
	AAE	25100	Intro. to Aerospace Design
(3)	ME	20000	Thermodynamics I
(3)	MA	26600	Ordinary Differential Eq.
(3)	General Education Elective		
(16)	Total		

**Proposed**

**Suggested Plan of Study for Aeronautical and Astronautical Engineering:**

**Credit Hours Required for Graduation: 130**

**Freshman Year**, see First-Year Engineering.

**Students planning to enter AAE are encouraged to take CGT 16300 and CS 15900 in the freshman year. CS 15900 is recommended as the Science Selective.**

**Sophomore Semester  
Third Semester**

(3)	AAE	20300	Aeromechanics
(0)	AAE	20000	Undergraduate Sophomore Seminar
(4)	MA	26100	Multivariate Calc.
(3)	MA	26500	Linear Algebra
(3)	PHYS	24100	Electricity and Optics <b>or</b>
	AAE	25100	Intro. to Aerospace Design
(3)	General Education Elective		
(16)	Total		

**Fourth Semester**

(3)	AAE	20400	Aeromechanics II
(1)	AAE	20401	Aeromechanics II Lab
(3)	PHYS	24100	Electricity and Optics <b>or</b>
	AAE	25100	Intro. to Aerospace Design
(3)	ME	20000	Thermodynamics I
(3)	MA	26600	Ordinary Differential Eq.
(3)	General Education Elective		
(16)	Total		

*Current*

**Aeronautics Concentration  
Junior Year  
Fifth Semester**

(3)	AAE	30100	Signals Analysis in Aerospace Engineering
(3)	AAE	33300	Fluid Mechanics
(1)	AAE	33301	Fluid Mechanics Lab.
(3)	AAE	35200	Structural Analysis
(0)	AAE	30000	Undergraduate Junior Seminar
(3)	MA	30400	Differential Equations for Eng. and the Sciences (with Analysis of Nonlinear Systems)
(3)	General Education Elective		
(16)	Total		

*Proposed*

**Aeronautical and Astronautical Engineering  
Junior Year  
Fifth Semester**

(3)	AAE	30100	Signals Analysis in Aerospace Engineering
(3)	AAE	33300	Fluid Mechanics
(1)	AAE	33301	Fluid Mechanics Lab.
(3)	AAE	35200	Structural Analysis
(0)	AAE	30000	Undergraduate Junior Seminar
(3)	MA	30400	Differential Equations for Eng. and the Sciences (with Analysis of Nonlinear Systems)
(3)	General Education Elective		
(16)	Total		

**Aeronautics Concentration  
Junior Year  
Sixth Semester**

(3)	AAE	33400	Aerodynamics
(1)	AAE	33401	Aerodynamics Lab
	AAE	35201	Structural Analysis Lab
(3)	AAE	34000	Dynamics and Vibrations
(3)	AAE	36400	Control Systems Analysis
(3)	AAE	33900	Aerospace Propulsion
	or	AAE	33800 Thermal Sciences
(3)	General Education Elective		
(16)	Total		

**Aeronautical and Astronautical Engineering  
Junior Year  
Sixth Semester**

(3)	AAE	33400	Aerodynamics
(1)	AAE	33401	Aerodynamics Lab <b>or</b>
	AAE	35201	Structural Analysis Lab
(3)	AAE	34000	Dynamics and Vibrations
(3)	AAE	36400	Control Systems Analysis
(3)	AAE	33900	Aerospace Propulsion
	or	AAE	33800 Thermal Sciences
(3)	General Education Elective		
(16)	Total		

*Current*

**Aeronautics Concentration**

**Senior Year**

**Seventh Semester**

- 
- (1) AAE 36401 Control Systems Lab
  - (3) AAE 42100 Flight Dynamics and Control
  - (1) AAE 40000 Undergraduate Senior Seminar
  - (6) Major or minor area electives
  - (3) Technical Elective
  - (3) General Education Elective
  - (17) Total

**Aeronautics Concentration**

**Senior Year**

**Eighth Semester**

- 
- (3) AAE 45100 Aircraft Design
  - (9) Major or Minor Area Electives
  - (3) Technical Elective
  - (3) General Education Elective
  - (18) Total

*Proposed*

**Aeronautical and Astronautical Engineering**

**Senior Semester**

**Seventh Semester**

- 
- (1) AAE 36401 Control Systems Lab
  - (1) AAE 40000 Undergraduate Senior Seminar
  - (6) **Major Concentration or AAE Selective area electives**
  - (6) Technical Elective
  - (3) General Education Elective
  - (17) Total

**Aeronautical and Astronautical Engineering**

**Senior Semester**

**Eighth Semester**

- 
- (3) AAE 45100 Aircraft Design OR **45000 Spacecraft Design**
  - (3) **AAE 42100** Flight Dynamics and Control OR **44000 Spacecraft Attitude Dynamics\***
  - (9) **Major Concentration or AAE Selective area electives**
  - (3) General Education Elective
  - (18) Total

*\*AAE 44000 is a spring only course. AAE 42100 can be taken in either 7<sup>th</sup> or 8<sup>th</sup> semester. AAE 45000/45100 can also be taken in the 7<sup>th</sup> or 8<sup>th</sup> semester.*