

# Program & Curriculum Approval - Executive Summary

## University of Minnesota, Twin Cities campus

[Close This Window](#)

Program Title: Aerospace Engineering and Mechanics B.A.E.M.

Approval Status: Proposal Not Submitted  
 Program Last Saved: Jan 17, 2013 1:40:19 PM  
 By: Thomas W Shield



### General Information

[Hide Section](#)

<b>Institution:</b>	University of Minnesota, Twin Cities (UMNTC)	<no change>
<b>Campus:</b>	Twin Cities (UMNTC)	<no change>
<b>Career:</b>	Undergraduate (UGRD)	<no change>
<b>Program type:</b>	Baccalaureate	<no change>
<b>Program title (short):</b>	Aerospace Engineering B.A.E.M.	<no change>
<b>Program title (long):</b>	Aerospace Engineering and Mechanics B.A.E.M.	<no change>
<b>Program short description:</b>	AerospEngr	<no change>
<b>Additional terms:</b>	<ul style="list-style-type: none"> <li>• This program is 8 semesters (4 years) long.</li> <li>• This program does not require any summer terms.</li> </ul>	<no change>
<b>Stakeholder college(s):</b>	<ul style="list-style-type: none"> <li>• Science and Engineering, Coll</li> </ul>	<no change>
<b>Degree-granting college(s):</b>	<ul style="list-style-type: none"> <li>• Science and Engineering, Coll</li> </ul>	<no change>
<b>Approver college(s):</b>	<ul style="list-style-type: none"> <li>• Science and Engineering, Coll</li> </ul>	<no change>

<b>Administrative college(s):</b>	• Science and Engineering, Coll	<no change>
<b>Budgetary college(s):</b>	• 'Science and Engineering, Coll'=100	<no change>
<b>Acad plan code(s):</b>	• 'Science and Engineering, Coll'=000821107	<no change>
<b>Department(s):</b>	• Aerospace Engineering & Mechanics	<no change>
<b>First term admitting students:</b>	Spring 1900	<no change>
<b>Effective date:</b>	2012-09-04 (Fall 2012)	2013-09-03 (Fall 2013)
<b>Degree:</b>	Bachelor of Aerospace Engineering and Mechanics (B A E M)	<no change>
<b>Catalog description:</b>	The mission of the bachelor of aerospace engineering and mechanics (B.A.E.M.) program is to produce graduates who are prepared to enter and sustain the practice of aerospace engineering and related fields, or to pursue advanced studies. This mission is consistent with the mission of the University of Minnesota in learning and teaching, and with the mission of the College of Science and Engineering: to provide a rigorous and stimulating education for its undergraduate majors and to provide programs of instruction in engineering that meet nationally accepted standards for practice of the profession of engineering. Aerospace engineering is a multidisciplinary field that encompasses many areas of science and engineering and plays a major role in the technological advancement of society. As a constantly changing profession, aerospace engineering is concerned with a wide range of problems and the latest technologies. An aerospace engineer must have a comprehensive fundamental education in mathematics, physical sciences, and engineering sciences. The four-year program leading to the B.A.E.M. provides this broad background. The program is accredited by the Engineering Accreditation Commission of ABET.	<no change>
<b>RIASEC codes:</b>	1. IRE	<no change>
<b>Field of study:</b>	Math, Engineering, and Science (MTH/ENG/SC)	<no change>
<b>Program contact(s):</b>	<b>U of M internet ID:</b> shield	<no change>

**Program contact's full name:** Thomas W Shield

**Email address:** shield@umn.edu

**Telephone number:** 612/626-7793

**Campus mailing address:**

Aerospace Engr and Mechanics Room 107 AkerH 0731A 110 Union St SE

Minneapolis, MN 55455

## Narrative Materials

[Hide Section](#)

<b>Brief summary or overview of reason for proposed new program or rationale for changes:</b>	update for chemistry course changes	Reducing number of required credits by 2.
		Changes related to CLE changes, moving credits from 4303W to 3101.
		(NOTE: 4303W will change to 3 credits in Spring 2015 so sample plan will be 122 credits to complete for any students than enter fall 2013)
<b>External accrediting agency for this program:</b>	ABET	<no change>
<b>External accrediting agency address:</b>	ABET, Inc. 111 Market Pl, Suite 1050 Baltimore, MD 21202	<no change>
<b>External accrediting agency phone number:</b>	410-347-7700	<no change>
<b>External accrediting agency website</b>	<a href="http://www.abet.org">http://www.abet.org</a>	<no change>

**URL:**

**Frequency of agency review:** Every six years <no change>

**Scheduled time of upcoming review:** UNKNOWN - 2013 - - 2013 UNKNOWN - 2013

**Program Delivery:**

- Classroom (majority of program is face-to-face) <no change>

**Mission, Priorities and Interrelatedness:** This program predates PCAS development so no information is available for this field. <no change>

**Need and Demand:** This program predates PCAS development so no information is available for this field. <no change>

**Comparative Advantage:** This program predates PCAS development so no information is available for this field. <no change>

**Efficiency, Effectiveness, and use of Resources:** This program predates PCAS development so no information is available for this field. <no change>

**Program Quality and Diversity Goals:** This program predates PCAS development so no information is available for this field. <no change>

**Program Development:** This program predates PCAS development so no information is available for this field. <no change>

### Admission Requirements

[Hide Section](#)

**Minimum courses or credits to be completed before admission:** 8 Courses <no change>

**Are any students** Yes. freshmen and transfer students <no change>

usually admitted to pre-major status before admission to this major?:

Is there a preferred minimum G.P.A. above 2.0 for students already admitted to the college(s) and now seeking entry to the major?:

<no change>

Preferred minimum G.P.A. for college-admitted students from another U of M college (I.U.T.s):

No G.P.A. requirement above 2.0.

<no change>

Preferred minimum G.P.A. for college-admitted students transferring from outside the University:

No G.P.A. requirement above 2.0.

<no change>

Explanation of G.P.A. above 2.0 requirements:

Limited space availability.

<no change>

Mathematics Course

**Mathematics Core**

Honors math (MATH 1571H, 1572H, (2573H or 2574H))

may be taken in place of the listed courses

**Calculus I**

[MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)

**Calculus II**

[MATH 1372](#) - CSE Calculus II (4.0 cr)

or [MATH 1272](#) - Calculus II (4.0 cr)

<no change>

**Multivariable Calculus**

[MATH 2374](#) - CSE Multivariable Calculus and Vector

Analysis (4.0 cr)

or [MATH 2263](#) - Multivariable Calculus (4.0 cr)

**Physics Core****Physics I**

[PHYS 1301W](#) - Introductory Physics for Science and  
Engineering I [PHYS, WI] (4.0 cr)

or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)

<no change>

**Physics II**

[PHYS 1302W](#) - Introductory Physics for Science and  
Engineering II [PHYS, WI] (4.0 cr)

or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

**Chemistry Core****Chemistry Lecture and Lab**

[CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)

[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0  
cr)

<no change>

**or Honors Chemistry Lecture and Lab**

[CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)

[CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS]  
(1.0 cr)

**Statics Core**

[AEM 2011](#) - Statics (3.0 cr)

<no change>

**Required  
Course(s):**

## Program Requirements

[Hide Section](#)

<b>Program length in credits:</b>	124 to 124 credits	122 to 122 credits
<b>Major length in credits:</b>	70 credits	71 credits
<b>Number of semesters of a second language that are required:</b>	0 semester(s)	<no change>
<b>Specific language(s) required:</b>	No Second Language	<no change>

### AEM Core

[AEM 2012](#) - Dynamics (3.0 cr)  
[AEM 2301](#) - Mechanics of Flight (3.0 cr)  
[AEM 3031](#) - Deformable Body Mechanics (3.0 cr)  
[AEM 4201](#) - Fluid Mechanics (4.0 cr)  
[AEM 4202](#) - Aerodynamics (4.0 cr)  
[AEM 4203](#) - Aerospace Propulsion (4.0 cr)  
[AEM 4301](#) - Orbital Mechanics (3.0 cr)  
[AEM 4303W](#) - Flight Dynamics and Control [WI] (4.0 cr)  
[AEM 4331](#) - Aerospace Vehicle Design (4.0 cr)  
[AEM 4501](#) - Aerospace Structures (3.0 cr)  
[AEM 4601](#) - Instrumentation Laboratory (3.0 cr)  
[AEM 4602W](#) - Aeromechanics Laboratory [WI] (4.0 cr)

### AEM Core

[AEM 2012](#) - Dynamics (3.0 cr)  
[AEM 2301](#) - Mechanics of Flight (3.0 cr)  
[AEM 3031](#) - Deformable Body Mechanics (3.0 cr)  
[AEM 4201](#) - Fluid Mechanics (4.0 cr)  
[AEM 3101](#) - Mathematical Modeling and Simulation in Aerospace Engineering (2.0 cr)  
[AEM 4202](#) - Aerodynamics (4.0 cr)  
[AEM 4301](#) - Orbital Mechanics (3.0 cr)  
[AEM 4501](#) - Aerospace Structures (3.0 cr)  
[AEM 4601](#) - Instrumentation Laboratory (3.0 cr)  
[AEM 4331](#) - Aerospace Vehicle Design (4.0 cr)  
[AEM 4602W](#) - Aeromechanics Laboratory [WI] (4.0 cr)  
[AEM 4203](#) - Aerospace Propulsion (4.0 cr)  
[AEM 4303W](#) - Flight Dynamics and Control [WI] (4.0 cr)

### Math. Science. and Engineering

### **Programming, EE, and Thermal Science**

[CSCI 1113](#) - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

[EE 3005](#) - Fundamentals of Electrical Engineering (4.0 cr)

[EE 3006](#) - Fundamentals of Electrical Engineering Laboratory (1.0 cr)

[ME 3324](#) - Introduction to Thermal Science (3.0 cr)

### **Material Science**

[MATS 2001](#) - Introduction to the Science of Engineering Materials (3.0 cr)

or [MATS 3011](#) - Introduction to Materials Science and Engineering (3.0 cr) <no change>

### **Physics III**

[PHYS 2503](#) - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)

or [PHYS 2303](#) - Physics III: Physics of Matter (4.0 cr)

or [PHYS 2403H](#) - Honors Physics III (4.0 cr)

### **Differential Equations and Linear Algebra**

[MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

or [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)

or [MATH 2574H](#) - Honors Calculus IV (4.0 cr)

### **Technical Electives**

At least three courses (to total at least 9 credits) are required. These are typically chosen from 4xxx and 5xxx AEM courses that extend material covered in the required courses. They may be from other engineering, math and science disciplines at the appropriate level. One may be a 2xxx or 3xxx math or science course. In particular AST 2001 may be used to complete a minor in astronomy. Details are available from:

[www.aem.umn.edu/teaching/undergraduate/advising\\_guide/index.shtml](http://www.aem.umn.edu/teaching/undergraduate/advising_guide/index.shtml)

[^ Return to top of Program Requirements](#)



[Hide Section](#)

**Sub-plan** No <no change>

**requirement for this program:**

**EIP**

**Title (long):** EIP <no change>

**Title (short):** EIP <no change>

**Sub-plan type:** Optional Sub-plan <no change>

**Type of sub-plan:** Track <no change>

**Sub-plan code:** EIP <no change>

**Sub-plan description:** Students may obtain professional experience in an industry or government assignment through an internship. The internship program usually consists of one term experience, generally in the summer. The practical engineering experience obtained through an internship not only enhances a student's education but also gives an edge on employment after graduation. <no change>

**Degree requirements:** Students can receive 3 credits by taking AEM 4796 (report required). These credits can be counted as a technical elective toward the B.A.E.M. degree. <no change>

**Required Course(s):** **Internship**  
[AEM 4796](#) - Professional Experience (3.0 cr) <no change>

[^ Return to top of Subplan\(s\)](#)

**Honors UHP**

**Title (long):** Honors UHP <no change>

**Title (short):** Honors UHP <no change>

**Sub-plan type:** Honors Sub-plan <no change>

**Type of sub-plan:** Honors <no change>

**Sub-plan code:** HONORSUHP <no change>

**Sub-plan description:** Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses <no change>

**Description:**

requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements. Current departmental honors course offerings are listed at:

[http://www.honors.umn.edu/academics/curriculum/dept\\_courses\\_current.html](http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html)

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

**Degree requirements:**

&lt;no change&gt;

**Required Course(s):**

[^ Return to top of Subplan\(s\)](#)

**Draft Online Catalog Display**

To see a sample of what this program would look like on the online catalog, click the link titled 'Show Draft Catalog Display'. Please note that this is a **draft** version of the display, as the proposal must still receive the appropriate approvals.

[Show Draft Catalog Display](#) for previous version.

[Show Draft Catalog Display](#) for proposal.