Educational Policies Committee Program Proposal, College of Engineering, May 17, 2019

Utah State University

Follow this and additional works at: https://digitalcommons.usu.edu/fs_edpol

Recommended Citation
https://digitalcommons.usu.edu/fs_edpol/421

This Program Proposal is brought to you for free and open access by the Faculty Senate at DigitalCommons@USU. It has been accepted for inclusion in Educational Policies Committee by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.
Utah System of Higher Education
New Academic Program Proposal
Cover/Signature Page - Abbreviated Template

Institution Submitting Request: Utah State University
Proposed or Current Program Title: Mechanical and Aerospace Engineering
Sponsoring School, College, or Division: Engineering
Sponsoring Academic Department(s) or Unit(s): Mechanical and Aerospace Engineering
Classification of Instructional Program Code1: 14.1901
Min/Max Credit Hours Required of Full Program: 15 / 15
Proposed Beginning Term2: Fall 2019
Institutional Board of Trustees' Approval Date:

☐ Certificate of Proficiency ☐ Entry-level CTE CP ☐ Mid-level CP
☐ Certificate of Completion
☐ Minor
☐ Graduate Certificate
☐ K-12 Endorsement Program
☐ NEW Emphasis for Regent-Approved Program
☐ Out of Service Area Delivery Program

Chief Academic Officer (or Designee) Signature:
I, the Chief Academic Officer or Designee, certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

Please type your first and last name ______________________ Date: ______________________

☐ I understand that checking this box constitutes my legal signature.

---

2 “Proposed Beginning Term” refers to first term after Regent approval that students may declare this program.
Utah System of Higher Education
Program Description - Abbreviated Template

Section I: The Request

Utah State University requests approval to offer the following Minor: Mechanical and Aerospace Engineering effective Fall 2019. This program was approved by the institutional Board of Trustees on .

Section II: Program Proposal/Needs Assessment

Program Description/Rationale
Present a brief program description. Describe the institutional procedures used to arrive at a decision to offer the program. Briefly indicate why such a program should be initiated. State how the institution and the USHE benefit by offering the proposed program. Provide evidence of student interest and demand that supports potential program enrollment.

There is a strong demand from industry for electrical engineers to have a better background in mechanical engineering topics. To address this need, the Mechanical and Aerospace Engineering Department developed the proposed requirements for a Minor in Mechanical Engineering. The program consists of existing classes (no new classes needed).

This need was first mentioned to us by our industrial advisory board. In addition, the following article: https://www.asme.org/engineering-topics/articles/technology-and-society/does-silicon-valley-have-enough-engineers outlines the need for cross disciplinary electrical engineers with a better background in mechanical engineering and similarly mechanical engineers with a better background in electrical engineering. The article states that "someone who has experience with industrial assets and mechanical engineering as well as IT skills will be the most sought after... Those people are not easy to find." Both the Mechanical and Electrical engineering departments at USU are developing minors to their BS degree programs to address this need. We currently have Electrical Engineering students taking classes from the Mechanical Engineering department and Mechanical Engineering students taking Electrical Engineering classes to make themselves more attractive to potential employers. What is lacking is formal recognition of these efforts on the students transcripts.

There is also interest from students in the Biological Engineering for a minor in Mechanical Engineering. This minor would be appropriate for any students in the engineering or physics programs at USU. Currently the Mechanical Engineering Departments at the University of Utah and the University of Idaho offer minors in their departments.

Labor Market Demand
Provide local, state, and/or national labor market data that speak to the need for this program. Occupational demand, wage, and number of annual openings information may be found at sources such as Utah DWS Occupation Information Data Viewer (jobs.utah.gov/jsp/wi/utalmis/gotoOccinfo.do) and the Occupation Outlook Handbook (www.bls.gov/oco).

According to https://jobs.utah.gov/jsp/utalmis/#/occupation/17-2141.00/report website, both Mechanical and Electrical Engineers have a 5 star rating for Occupation Outlook. Our graduates currently don’t have difficulty finding good paying jobs. As mentioned above, students with cross disciplinary backgrounds are highly sought after on both a state and national level. Putting forth this minor is a way for students to get that recognized for their cross disciplinary background.

Consistency with Institutional Mission/Impact on Other USHE Institutions
Explain how the program is consistent with the institution's Regents-approved mission, roles, and goals. Institutional mission and roles may be found at higheredutah.org/policies/policyr312/. Indicate if the program will be delivered outside of designated service area; provide justification. Service areas are defined in higheredutah.org/policies/policyr315/.

This minor would only be available at Utah State University and would be consistent with the institution’s mission, roles, and goals.
Finances

What costs or savings are anticipated in implementing the proposed program? If new funds are required, indicate expected sources of funds. Describe any budgetary impact on other programs or units within the institution.

No additional costs are anticipated with this change. The number of students anticipated to participate in the minor will be small enough to fit into our current class enrollments.
Section III: Curriculum

Program Curriculum

List all courses, including new courses, to be offered in the proposed program by prefix, number, title, and credit hours (or credit equivalences). Indicate new courses with an X in the appropriate columns. The total number of credit hours should reflect the number of credits required to receive the award. For NEW Emphases, skip to emphases tables below. For variable credits, please enter the minimum value in the table below for credit hours. To explain variable credit in detail as well as any additional information, use the narrative box below.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>NEW Course</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>General Education Courses (list specific courses if recommended for this program on Degree Map)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>General Education Credit Hour Sub-Total</td>
<td>0</td>
</tr>
<tr>
<td>+X-</td>
<td>ENGR 2010</td>
<td>Engineering Mechanics Statics</td>
<td>3</td>
</tr>
<tr>
<td>+X-</td>
<td>ENGR 2030</td>
<td>Engineering Mechanics Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>+X-</td>
<td>ENGR 2140</td>
<td>Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>+X-</td>
<td>MAE 2300</td>
<td>Thermodynamics</td>
<td>3</td>
</tr>
</tbody>
</table>

|               |            | Required Course Credit Hour Sub-Total | 12           |
| +X-           | MAE 3040   | Mechanics of Solids                | 3            |
| +X-           | MAE 3340   | Instrumentation and Measurements   | 3            |
| +X-           | MAE 3420   | Fluid Mechanics                    | 3            |
| +X-           | MAE 5300   | Vibrations                         | 3            |
| +X-           | MAE 5310   | Dynamic Systems and Controls       | 3            |
| +X-           | ECE 5310   | Control Systems                    | 3            |
| +X-           | MAE 5320   | Mechatronics                       | 3            |
| +X-           | ECE 5320   | Mechatronics                       | 3            |
| +X-           | MAE 5350   | Kinematics                         | 3            |
| +X-           | MAE 5360   | Advanced Dynamics                  | 3            |

|               |            | Elective Credit Hour Sub-Total     | 3            |
|               |            | Core Curriculum Credit Hour Sub-Total | 15           |

Program Curriculum Narrative

Describe any variable credits. You may also include additional curriculum information, as needed.

Only one course from the above elective course list needs to be taken. No course may be applied toward a minor in Mechanical Engineering with an earned grade of less than C-. No course may be repeated more than one time to improve the grade to a C- or better. Courses for Mechanical Engineering Minors may not be taken on a Pass/ Fail Basis.
**Degree Map**

Degree maps pertain to undergraduate programs ONLY. Provide a degree map for proposed program. Degree Maps were approved by the State Board of Regents on July 17, 2014 as a degree completion measure. Degree maps or graduation plans are a suggested semester-by-semester class schedule that includes prefix, number, title, and semester hours. For more details see [http://higheredutah.org/pdf/agendas/201407/TAB%20A%202014-7-18.pdf](http://higheredutah.org/pdf/agendas/201407/TAB%20A%202014-7-18.pdf) (Item #3).

Please cut-and-paste the degree map or manually enter the degree map in the table below.

A typical degree map could be as follows:

**Year 1**
- Fall Semester - ENGR 2010 (Statics), 3 credits
- Spring Semester - ENGR 2030 (Dynamics), 3 credits
- Summer Semester - ENGR 2140 (Mechanics of Solids), 3 credits

**Year 2**
- Fall Semester - MAE 5310 (Control Systems), 3 credits
- Spring Semester - MAE 2300 (Thermodynamics), 3 credits

It is noted that ENGR 2010, 2030, and 2140 and MAE 2300 are currently taught every semester (including summer in most years) giving flexibility. Completing all the required classes for the minor will satisfy the prerequisites for all of the elective classes listed.