REQUEST FOR PROGRAM CHANGE(S)

University of Central Oklahoma

Please note: All information contained in this form will be reviewed by persons outside of your college. Please use clear and concise language when completing this form.

Name of program-major or minor to be changed: (maximum of 30 spaces)
Existing Name: 
Mechanical Engineering - Mechanical Engineering

Proposed Name: (if changing) (maximum of 30 spaces)
*Remember when abbreviating names, this is how they will appear on student’s transcripts.

Proposed Name: (full name of program/major if longer than 30 spaces)

Is this a: 
X Program 
X Major 
___ Minor 
___ Sequence of Courses

Proposed change:
___ Name Change 
___ Degree Designation 
___ Admission Requirement 
X Curriculum Change 
___ GPA Requirement 
X Other: BS/PSM BS/MS

Is this program: 
X Undergraduate 
___ Graduate

Is this a teacher preparation program? (All courses required for any teacher preparation program must have approval from the Council on Teacher Education (CTE) before approval from AACC or Graduate Council.)
Yes X No If yes, send copy of proposal to the Director of Teacher Education, Dr. Bryan Duke.

CTE Approval (Stamp or initial)

Engineering and Physics

Department submitting the proposal

Evan Lemley elemley@uco.edu 5473
Person to contact with questions email address Ext. number

Approved by:

9/24/2020 9/30/20
Department Chair College Curriculum Committee Chair
Date Date
(Please notify department chair when proposal is forwarded to dean.)

9/20/2020
College Dean
Date
(Please notify department chair when proposal is forwarded to AA.)

Academic Affairs Curriculum or Graduate Council Date

Office of Academic Affairs Date
Effective term for this program change
(Assigned by Academic Affairs)
1. Does this program change affect other programs or departments? 
   [X] Yes  
   No 
   If yes, provide name(s) of department chair(s) contacted, date(s), and results of discussion(s).

   The proposed accelerated degree program pipelines undergraduate students in a program in the Engineering and Physics Department into a master's program under CREIC (Computational Research and Education in Interdisciplinary Computation). The Director of CREIC, Evan Lemley, and the Chair of Engineering and Physics, Charles Hughes, discussed this proposal on multiple occasions, the last of which was 08/28/2020, and they agreed to the contents of this proposal.

2. Proposed curriculum change(s):
   (Please include entire major/minor as it exists and as it is proposed. Italicize and bold changes.)

   FROM

   (Existing Catalog Requirements)

   Support Courses
   PHIL 1123 Contemporary Moral Problems
   ECON 1103 Introduction to Economics
   FMKT 2323 Global Protocol and Diversity (or Foreign Language)
   MATH 1533 Precalculus-Algebra OR MATH 1513 College Algebra OR Placement Score AND MATH 1593 Plane Trigonometry OR Placement Score
   *A grade of 'C' or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

   Students majoring in the Mechanical Engineering program are encouraged to complete the following course in high school.
   One year of high school physics OR PHY 1003 Introduction to Physics

   Major Requirements
   Mechanical Engineering .................................. 94-99
   Physics .................................................................. 11
   Required courses:
   PHY 2014 Physics for Science and Engineering I and Lab
   PHY 2114 Physics for Science and Engineering II and Lab
   PHY 3883 Mathematical Physics I

   Engineering ................................................................... 57
   Required courses:
   ENGR 1112 Introduction to Engineering and Laboratory
   ENGR 1213 Engineering Computing and Laboratory
   ENGR 2033 Statics
   ENGR 2043 Dynamics
   ENGR 2143 Strength of Materials
   ENGR 2151 Strength of Materials Lab
   ENGR 2303 Electrical Science
   ENGR 2311 Electrical Science Laboratory
   ENGR 3203 Thermodynamics
   ENGR 3211 Thermal Engineering Laboratory
   ENGR 3303 Engineering Probability and Statistics
   #ENGR 3323 Signals and Systems
   ENGR 3331 Signals and Systems Laboratory
   #ENGR 3363 Mechanical Engineering Design
   #ENGR 3413 Materials Science
   #ENGR 3443 Fluid Mechanics
   #ENGR 3451 Fluid Mechanics Lab
   ENGR 3703 Computational Methods in Engineering

   TO

   (Proposed Catalog Requirements)

   Support Courses
   PHIL 1123 Contemporary Moral Problems
   ECON 1103 Introduction to Economics
   FMKT 2323 Global Protocol and Diversity (or Foreign Language)
   MATH 1533 Precalculus-Algebra OR MATH 1513 College Algebra OR Placement Score AND MATH 1593 Plane Trigonometry OR Placement Score
   *A grade of 'C' or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

   Students majoring in the Mechanical Engineering program are encouraged to complete the following course in high school.
   One year of high school physics OR PHY 1003 Introduction to Physics

   Major Requirements
   Mechanical Engineering .................................. 94-99
   Physics .................................................................. 11
   Required courses:
   PHY 2014 Physics for Science and Engineering I and Lab
   PHY 2114 Physics for Science and Engineering II and Lab
   PHY 3883 Mathematical Physics I

   Engineering ................................................................... 57
   Required courses:
   ENGR 1112 Introduction to Engineering and Laboratory
   ENGR 1213 Engineering Computing and Laboratory
   ENGR 2033 Statics
   ENGR 2043 Dynamics
   ENGR 2143 Strength of Materials
   ENGR 2151 Strength of Materials Lab
   ENGR 2303 Electrical Science
   ENGR 2311 Electrical Science Laboratory
   ENGR 3203 Thermodynamics

   Functional review: CF
   (undergraduate proposals only)
Minimum Grad Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO ................................. 2.00
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 66-67 of the 2019-2020 catalog.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>#*ENGR 4123</td>
<td>Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>#ENGR 4141</td>
<td>Heat Transfer Lab</td>
<td></td>
</tr>
<tr>
<td>#*ENGR 4533</td>
<td>Thermal Systems Design</td>
<td></td>
</tr>
<tr>
<td>#*ENGR 4803</td>
<td>Mechatronics &amp; Laboratory</td>
<td></td>
</tr>
<tr>
<td>#ENGR 4882</td>
<td>Senior Engineering Design I</td>
<td></td>
</tr>
<tr>
<td>#ENGR 4892</td>
<td>Senior Engineering Design II</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Required courses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MATH 2313 Calculus 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MATH 2323 Calculus 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MATH 2333 Calculus 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MATH 2343 Calculus 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MATH 3103 Differential Equations</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Required courses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHEM 1315 Chemistry for Engineering and Lab OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHEM 1103 General Chemistry I AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHEM 1112 General Chemistry I Recitation/Lab AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHEM 1223 General Chemistry II AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHEM 1232 General Chemistry II Recitation/Lab</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guided Physics or Engineering Electives</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Selected from the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGR 3153 Machine Dynamics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGR 3223 Digital Logic Design and Laboratory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGR 3803 Electrical Power Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGR 4103 Finite Element Analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGR 4153 Vibration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGR 4203 Refrigeration and Air Conditioning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGR 4303 Control Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGR 4313 Fluid Dynamics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BME 4343 Biomechanics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHY 4163 Analytical Mechanics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>#Students in the Accelerated BS/MS program in Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physics must enroll in the graduate level versions of this course.</td>
<td></td>
</tr>
<tr>
<td></td>
<td># Admission into Engineering and Physics Upper Division is required.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minimum Hours required ................. 127*</td>
<td></td>
</tr>
</tbody>
</table>

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, physics and two years of a second language in high school.

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO ................................. 2.00
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 66-67 of the 2019-2020 catalog.

ENGR 3211 Thermal Engineering Laboratory
ENGR 3303 Engineering Probability and Statistics
#ENGR 3323 Signals and Systems
ENGR 3331 Signals and Systems Laboratory
#ENGR 3363 Mechanical Engineering Design
#ENGR 3413 Materials Science
#ENGR 3443 Fluid Mechanics
#ENGR 3451 Fluid Mechanics Lab
ENGR 3703 Computational Methods in Engineering
#ENGR 4123 Heat Transfer
#ENGR 4141 Heat Transfer Lab
#ENGR 4533 Thermal Systems Design
#ENGR 4803 Mechatronics & Laboratory
#ENGR 4882 Senior Engineering Design I
#ENGR 4892 Senior Engineering Design II
Mathematics............................................ 15

*Students in the Accelerated BS/MS program in Engineering |
*Admission into Engineering and Physics Upper Division is required. |

Guided Physics or Engineering Electives | 6
Selected from the following:
ENGR 3153 Machine Dynamics
ENGR 3223 Digital Logic Design and Laboratory
ENGR 3803 Electrical Power Systems
ENGR 4103 Finite Element Analysis
ENGR 4153 Vibration
ENGR 4203 Refrigeration and Air Conditioning
ENGR 4303 Control Systems
ENGR 4313 Fluid Dynamics
BME 4343 Biomechanics
PHY 4163 Analytical Mechanics

Minimum Hours required ................. 127*

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, physics and two years of a second language in high school.

Minimum Grade Requirements
1. Average in (a) all college course work, and (b) course work at UCO .................................................. 2.00
2. A minimum grade of “C” must be earned in all courses in the major to count toward meeting degree requirements. For other regulations pertaining to graduation, see pages xx-XX of the 2021-2022 catalog.

Accelerated BS/MS

The Department of Engineering and Physics offers a M.S. Engineering Physics – Mechanical Engineering major. Students in the B.S. Mechanical Engineering program are eligible to pursue, with approval, the M.S. Engineering Physics – Mechanical Engineering degree beginning in their senior year. Approved B.S. Mechanical Engineering students may take up to nine credit hours of 5000-level ENGR courses during their senior year of the BS program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Engineering Physics program and an approval from the Department of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Engineering Physics-Mechanical Engineering.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Mechanical Engineering and the M.S. Engineering Physics Mechanical Engineering programs:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 5023</td>
<td>Heat Transfer</td>
</tr>
<tr>
<td>ENGR 5533</td>
<td>Thermal Systems Design</td>
</tr>
<tr>
<td>ENGR 5803</td>
<td>Mechatronics &amp; Laboratory</td>
</tr>
</tbody>
</table>

Accelerated BS/PSM

UCO’s PSM (Professional Science Master’s) in Computational Science has partnered with the BS in Mechanical Engineering so that approved students may take up to 10 credit hours of 5000-level ENGR courses during their senior year of the BS program. These courses will count toward both the BS and PSM degrees. A formal application to the PSM Computational Science program and an approval from the Department of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Computational Science Computational Engineering, P.S.M.

Up to 10 credit hours of the following courses can be used to satisfy both the B.S. Mechanical Engineering and the P.S.M. Computational Science – Computational Engineering

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 5023</td>
<td>Heat Transfer</td>
</tr>
<tr>
<td>ENGR 5103</td>
<td>Finite Element Analysis</td>
</tr>
<tr>
<td>ENGR 5333</td>
<td>Digital Signal Processing</td>
</tr>
<tr>
<td>ENGR 5311</td>
<td>Digital Signal Processing Laboratory</td>
</tr>
</tbody>
</table>

(undergraduate proposals only)
3. Degree Designation: (Example, B.A. to B.F.A.)
   Existing Designation: NA To: ________

4. Change(s) in Minimum GPA Requirements:
   FROM (Existing Catalog Requirements) TO (Proposed Catalog Requirements)
   NA

5. Change(s) in Admission Requirements for the Program/Major:
   FROM (Existing Catalog Requirements) TO (Proposed Catalog Requirements)
   NA

6. Other requested action:
   NA

7. Will requested change require additional funds? __ Yes  X No
   If yes, please specify the amount of the additional costs, the source of the funds, and how they will be expended over the next three years, including new or re-allocated full or part time faculty/staff.

<table>
<thead>
<tr>
<th>Additional Funds</th>
<th>20</th>
<th>20</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of additional costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of funds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How funds will be expended</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Please provide a summary of the requested changes. (This is a listing of the changes requested) (This information will be submitted to the OSRHE)
   These changes will enable students admitted to the proposed accelerated BS/PSM program in this undergraduate major, to take up to 10 hours of graduate coursework while seniors. These courses will be used to satisfy the requirements of both this undergraduate program and the PSM program.

   In addition, these changes will enable students admitted into the existing accelerated BS/MS program in Engineering Physics – Mechanical Engineering to take up to nine hours of graduate coursework while seniors. These courses may be used to satisfy the requirements of both this undergraduate program and the MS program in Engineering Physics – Mechanical Engineering.

9. The reason(s) for this change are based on which of the following: (Check all that apply, explain and document in Question #10)
   ___ Specialized Accreditation
   ___ SSCI (Self Study for Continuous Improvement)
   ___ Benchmark (e.g. comparison to peer institutions)
   ___ Assessment Data
   ___ Faculty Knowledge/Discipline Expertise
   ___ Advisory Board/Outside Professional Group
   X ___ Other
10. For all items checked in Question #9, please provide a concise, yet comprehensive, statement that explains the reasons for requesting the change including any necessary documentation. (The information provided here will be submitted to the OSRHE)

Discussions with senior UCO students have shown their interest in the proposed accelerated BS/PSM program. In open house and career fairs in which the PSM director has marketed the PSM program, this is the most common question from UCO students. The proposed changes would clearly ease the pathway to obtaining a master's degree and doing it in less time for UCO students in this undergraduate major.
Accelerated Degree Program Curricular Form

Thank you for your desire to have an Accelerated Degree Program approved through the Graduate College curriculum review process, which involves a recommendation from the Graduate Council's Curriculum Committee.

Given that Accelerated Degree Programs permit an undergraduate student to enroll in graduate courses and to count the completed graduate courses toward their undergraduate degree, these curriculum proposals are approved through both undergraduate (Academic Affairs Curriculum Committee) and graduate (Graduate Council) curricular processes. The Academic Affairs Curriculum Committee reviews Accelerated Degree Program proposals and makes recommendations to the Graduate Council.

In order for the Graduate Council to review the proposal submitted, this form should be completed and submitted with the undergraduate curriculum proposal. If approved, the information provided below will be used by the Graduate College to develop the Accelerated Degree Program paragraph in the Graduate Catalog degree sheet; a sample Degree Sheet paragraph is provided below.

Undergraduate Degree Faculty Contact:
Mohammad Hossan

Undergraduate Degree Department:
Engineering and Physics

Name of the Undergraduate Degree in the Accelerated Degree Program:
Mechanical Engineering

Name of the Graduate Degree in the Accelerated Degree Program:
Computational Science-Computational Engineering

Name of the Graduate Program Advisor for the ADP Graduate Degree:
Evan Lemley

Specific Graduate Courses to Be Counted Toward the Undergraduate and Graduate Degrees:

<table>
<thead>
<tr>
<th>Graduate Course Prefix</th>
<th>Graduate Course No.</th>
<th>Graduate Course Credit Hour</th>
<th>Graduate Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR</td>
<td>5803</td>
<td>3</td>
<td>Mechatronics &amp; Laboratory</td>
</tr>
<tr>
<td>ENGR</td>
<td>5023</td>
<td>3</td>
<td>Heat Transfer</td>
</tr>
<tr>
<td>ENGR</td>
<td>5103</td>
<td>3</td>
<td>Finite Element Analysis</td>
</tr>
<tr>
<td>ENGR</td>
<td>5333</td>
<td>3</td>
<td>Digital Signal Processing</td>
</tr>
<tr>
<td>ENGR</td>
<td>5311</td>
<td>1</td>
<td>Digital Signal Processing Laboratory</td>
</tr>
<tr>
<td>BME</td>
<td>5223</td>
<td>3</td>
<td>Biomedical Imaging</td>
</tr>
</tbody>
</table>

Please Note: No more than 10 hours of graduate coursework in an Accelerated Degree Program may be double-counted for both a graduate and undergraduate degree. No undergraduate coursework may be counted toward a graduate degree. All students are required to apply to the Graduate College for ADP admission and are subject to Graduate College policies upon graduate admittance.
Sample Accelerated Degree Program Graduate Catalog Degree Sheet Paragraph

Accelerated Degree Program
Students who are accepted to the undergraduate degree in Mechanical Engineering may apply to take up to a maximum of 10 hours during their senior year of the bachelor's degree. These courses will count toward both the B.S. Mechanical Engineering and P.S.M. Computational Science - Computational Engineering. The approved graduate courses are: ENGR 5023 Heat Transfer, ENGR 5103 Finite Element Analysis, BME 5223 Biomedical Imaging, ENGR 5333 Digital Signal Processing, ENGR 5311 Digital Signal Processing Laboratory, ENGR 5803 Mechatronics & Laboratory. These courses are specified on the degree sheet. During the last semester of their junior year or within 30 hours of graduation, an undergraduate student with a 3.0 overall GPA may apply for admission to the Accelerated Degree Program.