Wilkes University Curriculum Committee
PROPOSAL SUBMITTAL FORM

Directions:
- Use this set of forms for all proposals sent to the Curriculum Committee.
- Pages 1-3 of this document are required. Any unnecessary forms should be deleted from the packet before submissions. If multiple forms are needed (course addition, course deletion, etc), simply copy and paste additional forms into this packet.
- Note that all new programs (majors and minors), program eliminations, significant program revisions and all general education core revisions must be reviewed and approved by the Provost and Academic Planning Committee (APC) prior to submission to the Curriculum Committee. The Provost will make the decision if a program revision requires APC review.
- Completed and signed forms are due no later than the second Tuesday of every month. Submit one signed original hard copy and a scanned electronic copy with all signatures to the Chair of the Curriculum Committee.

1. Originator: Edward T. Bednarz III, Ph.D.
   Associate Professor
   Department of Mechanical Engineering and Engineering Management
   (570)408-7913 / Edward.Bednarz@Wilkes.edu

2. Proposal Title: ME 400 level new courses

3. Check only one type of proposal: (double click on the appropriate check box and change default value to "checked"). Each different type of proposal must be submitted on a separate form.
   - New Program. (Major or Minor Degree Programs). This requires prior review and approval by the Provost and APC. Major = minimum of 30 credits, minor = minimum of 18 credits.
   - New Concentration, Track, or Certificate. The Provost determines if review and approval by APC is necessary. Concentration – minimum of 12 credits, certification, endorsement and track are discipline specific.
   - Elimination of Program. (Major or Minor Degree Programs). This requires prior review and approval by the Provost and APC.
   - Elimination of Concentration, Track, or Certificate. The Provost determines if review and approval by APC is necessary.
   - Program Revision. Significant revisions to a program require review and approval by the Provost. The Provost determines if review and approval by APC is necessary.
   - General Education Revision. Submissions only accepted from the General Education Committee (GEC). Must be reviewed and approved by the Provost.
   - Creation of new departments, elimination of existing department. This requires prior review and approval by the Provost and APC.
   - Course additions or deletions not affecting programs (such as elective courses, transition of “topics” courses to permanent courses).
   - Change in course credit or classroom hours.
   - Incidental Changes. Includes changes in course/program title, course descriptions, and course prerequisites. (Although these changes do require approval by the Curriculum Committee, they do not go before the full faculty for approval).
   - Other (Specify)

Indicate the number of course modification forms that apply to this proposal:
   ___2___ Course Addition Form (Attach Syllabi: refer to Faculty Handbook for requirements)
   ______ Course Deletion Form
   ______ Course Change Form

Revised 4/30/2018
4. Executive Summary of Proposal. 
   Briefly summarize this proposal. The breadth and depth of this executive summary should reflect the complexity and significance of the proposal. Include an overview of the proposal, background and reasoning behind the proposal and a description of how the proposal relates to the mission and strategic long-range plan of the unit and/or university.
   For incidental changes a one or two sentence explanation is adequate.
   The Department of Mechanical Engineering and Engineering Management will be adding two 400 level courses for the graduate curriculum. These courses are already cross listed at the undergraduate 300 level as a technical elective and are typically cross listed as a 400 level for graduate students. Approval was already granted for the 300 level courses.

5. Other specific information. (Not applicable for incidental changes.)
   What other programs, if any, will be affected by this proposal? Describe what resources are available for this proposal. Are they adequate? What would be the effect on the curriculum of all potentially affected programs if this proposal were adopted? Include any potential effects to the curriculum of current programs, departments and courses.
   No other programs will be affected.

6. Program Outline. (Not applicable for incidental changes).
   A semester-by-semester program outline as it would appear in the bulletin for a new program or any modified program with all changes clearly indicated.
   N/A

7. New Program Assessments: (For new programs ONLY)
   All new major programs reviewed through the Curriculum Committee must complete this section. Please consult the following page for guidance in developing an assessment plan: [https://wilkes.edu/about-wilkes/university-committees/assessment/assessment-planning.aspx](https://wilkes.edu/about-wilkes/university-committees/assessment/assessment-planning.aspx)
   a. Please list program-level student learning outcomes (SLOs) that all program majors should be able to demonstrate upon graduation from the program. SLOs should be worded such that student performance can be measured directly.
      N/A
   b. Please briefly describe current plans for how student performance on each program-level SLO will be assessed. Be sure to answer where (which courses), when (frequency), and how (assessment method) for each SLO.
      N/A
   c. Please identify by name any external accreditation agency or agencies that will influence assessment planning. Include standards or requirements from that accreditor that must be followed when developing the program’s assessment plan. You are encouraged to share specific, current web links to relevant content when standards or requirements related to assessment are substantial.
      N/A
Signatures and Recommendations. (please date)

- Signatures of involved Department chair(s) and Dean(s) indicate agreement with the proposal and that adequate resources (library, faculty, technology) are available to support proposal.
- If a potential signatory disagrees with a proposal he/she should write “I disagree with this proposal” and a signed statement should be attached to this submission.

Print Name/Title: Henry J. Castejon
Signature: Henry J. Castejon
Date: Nov 09, 2018

Department chair(s) of all potentially affected programs – Dr. Henry Castejon, Mechanical Engineering and Engineering Management

Print Name/Title: Prahlad Murthy
Signature: Prahlad Murthy
Date: Nov 9, 2018

Dean (s) of any potentially affected College/School – Dr. Prahlad Murthy, CSE

Print Name: Susan Hritzak
Signature: Susan Hritzak
Date: 11/9/18

Registrar – Susan Hritzak
1. Course Title: Advanced CADD

2. Course Number: ME 480
   Coordinate with Registrar to insure course number is available

3. Course Credits: __3___
   Classroom Hours___3___  Lab Hours______  Other______

4. Course Pre-requisites: ME 180, ME 335

5. Course Co-requisites:

6. Effective Date of Addition (semester/year)  _Spring 2019

7. Course Description (as proposed for the Bulletin): Course descriptions provide an overview of the topics covered. If the course is offered on a scheduled basis, i.e. every other year, or only during a set semester, note this in the description. Course descriptions should be no more than two to three sentences in length.

   An advanced course in Computer Aided Drafting and Design (CADD) using SolidWorks. This course will introduce topics such as advanced modeling, advanced assemblies, Finite Element Analysis (FEA) and sheet metal.

8. Required Documentation:
   Proposed Syllabus Attach proposed syllabi immediately after this document. In some situations the official syllabus may contain information which is beyond the review needs of the Curriculum Committee (such as extensive rubrics, etc). It is permissible to attach an abbreviated syllabus. In general, syllabi (whether full or abbreviated) should contain the following information: Course Title, Course Number, Credit hours, Faculty Information (name contact information, office hours), Course Description, Course Outcomes or Objectives, Assessment (grading) informations, required texts (or other things such as tools, software, etc), pertinent policies and a proposed schedule of topics.
A. GENERAL INFORMATION:  Technical Elective
Instructor: Dr. Edward T. Bednarz III, Associate Professor of Mechanical Engineering
Contact Info: SLC 375, Phone: 570-408-7913
E-Mail: Edward.Bednarz@wilkes.edu

B. CATALOG DESCRIPTION:
ME 380 / ME 480 – Advanced CADD  Three credits
An advanced course in Computer Aided Drafting and Design (CADD) using SolidWorks. This course will introduce topics such as advanced modeling, advanced assemblies, Finite Element Analysis (FEA) and sheet metal.
Prerequisites: ME 180, ME 335

C. LEARNING OBJECTIVES:
1. Learn techniques of advanced modeling (a, c, e, g, k)
2. Construct top down and bottom up advanced assemblies (a, c, e, g, k)
3. Utilize SolidWorks Finite Element Analysis (FEA) as well as modal analysis (a, c, e, g, k)
4. Learn how to draw sheet metal parts (a, c, e, g, k)
5. Work with a small group to utilize engineering design for a set purpose while under certain constraints (a, b, c, e, f, g, h, i, j, k)
   * The letters in parenthesis refers to ABET outcomes

D. RELATIONSHIP OF THE COURSE OUTCOMES TO ABET (Criterion 3) OUTCOMES:
The Accreditation Board for Engineering and Technology (ABET) Criteria 2000 define a number of program outcomes that all graduates of ABET accredited Engineering programs must have. How this course is related to ABET outcomes (a-k) is listed below:
**Outcomes a,c, e, g and k** are central to the course. These outcomes are attained by learning principles of advanced computer aided drafting and design. The student will use computer tools for successful engineering design.
**Outcomes b, f, h, and i** will be obtained through the group design project where students will use constraints and teamwork to solve a problem.

E. TOPICS COVERED:
Advanced modeling, advanced assemblies, Finite Element Analysis (FEA) and sheet metal

F. PREREQUISITES BY TOPIC:
Parametric CAD modeling

G. HOMEWORK AND PROJECT SCHEDULE:
1. Homework, attendance and class participation will consist of 1/3rd of the final grade.
2. Late HW will receive partial credit.
3. If working with other people on a homework assignment, be sure to list their names.
4. Each assignment is to be turned in individually.
5. Attendance is mandatory! Two sessions absentee will receive a zero final grade for the course.
6. There will be two design projects worth 1/3rd each of the final grade.

H. GRADING:
The final course grade will be determined as follows: ≥ 90% = 4.0; 85-89.9% = 3.5; 80-84.9% = 3.0;
75-79.9% = 2.5; 70-74.9%= 2.0; 65-69.9%= 1.5; 60-64.9% = 1.0; < 60% = 0.0

I. Methods of Assessment:
Graded HW Graded Exams Design Project
Instructor Judgment Course Evaluations by Students Faculty Course Assessment
Program skills surveys (performance criteria)

* Academic dishonesty will not be tolerated. The punishment of cheating or plagiarism can range from
a 0% on an assignment, 0.0 for course or expulsion from school.
1. Course Title: Robotics

2. Course Number: ME 417
   Coordinate with Registrar to insure course number is available

3. Course Credits: __3__
   Classroom Hours __2__  Lab Hours __2__  Other ______

4. Course Pre-requisites: ME 234, EGR 222, MTH 212

5. Course Co-requisites:

6. Effective Date of Addition (semester/year) _Spring 2019_

7. Course Description (as proposed for the Bulletin):
   Course descriptions provide an overview of the topics covered. If the course is offered on a scheduled basis, i.e. every other year, or only during a set semester, note this in the description. Course descriptions should be no more than two to three sentences in length.

   This course is an introduction of robot mechanisms, intelligent controls and industrial robot programming. Course topics include kinematics and motion planning; mechanism design for manipulators and mobile robots, dynamics and control design, actuators and sensors; human-machine interface, and embedded software. Laboratories and projects provide experience with DC and servo motors, real-time feedback control, embedded software and industrial robot programming.
   Prerequisite: EGR 222 Mechatronics, ME 234 Dynamics and MTH 212 Multivariable Calculus

8. Required Documentation:
   Proposed Syllabus Attach proposed syllabi immediately after this document. In some situations the official syllabus may contain information which is beyond the review needs of the Curriculum Committee (such as extensive rubrics, etc). It is permissible to attach an abbreviated syllabus. In general, syllabi (whether full or abbreviated) should contain the following information: Course Title, Course Number, Credit hours, Faculty Information (name contact information, office hours), Course Description, Course Outcomes or Objectives, Assessment (grading) informations, required texts (or other things such as tools, software, etc), pertinent policies and a proposed schedule of topics.
1. COURSE NUMBER & NAME ME 317/417 Robotics
2. CREDITS AND CONTACT HRS 3 Credits- 2 contact hrs for lecture, 2 contact hrs for lab
3. INSTRUCTOR: Dr. Yong Zhu. Assistant Prof. of Mech. Engineering
   OFFICE: SLC 362
   OFFICE HOURS: MWT: 3-5PM
   CLASS TIME: Lecture MW 10-10:50 SLC263 or MW 11-11:50 SLC124; Lab SLC238
   CONTACT INFO: yong.zhu@wilkes.edu
4. TEXT BOOK: No required books, Below are two good references
5. OTHER SUPPLY MATERIALS Lecture notes and handout
6. SPECIFIC COURSE INFO
5. CATALOG DESCRIPTION: ME 317/417 - Robotics - Three Credits,
a. This course is an introduction of robot mechanisms, intelligent controls and industrial robot programming. Course topics include kinematics and motion planning; mechanism design for manipulators and mobile robots, dynamics and control design, actuators and sensors; human-machine interface, and embedded software. Laboratories and projects provide experience with DC and servo motors, real-time feedback control, embedded software and industrial robot programming.
b. Prerequisite: EGR222 Mechatronics and ME234 Dynamics
c. Required Course for ME majors, technical elective for EE majors.
6. SPECIFIC GOALS FOR THE COURSE
7. COURSE LEARNING OUTCOMES:
a. Understand the hardware components, kinematics, dynamics and control of robot systems.
b. Apply algorithms for robotic perception, planning, navigation, localization, and manipulation.
c. Implement and use algorithms for controlling mobile robots.
d. Gain experience with industrial robot programming.
e. Gain familiarity with the interdisciplinary field of robotics and its growing impact on society.
f. Become more comfortable and effective working in a team setting.
8. MAPPING OF THE COURSE LEARNING OUTCOMES TO ABET OUTCOMES:

**Outcome a** is addressed through the understanding of hardware components, kinematic dynamics and control of robot systems.

**Outcome b** is addressed through the mobile robot project which requires knowledge of electromechanical system design and integration.

**Outcomes c and e** are addressed through the mobile robot course project which requires students to design hardware platform and use algorithms to control mobile robots.

**Outcomes c and e** are also addressed through the industrial robot course project which requires students to program an ABB IRB120 robot.

**Outcome d** is addressed through the emphasis on integration of mechanical design, circuit design and microcontroller programming.

**Outcome g** is addressed somewhat through project discussions.

**Outcomes f, h, i and j** are not significantly addressed in this course.

**Outcome g** is addressed through the use of ABB RobotStudio package and Arduino microcontroller programming tool.

9. TOPICS COVERED:

1. Fundamentals of robotics: kinematic, dynamics and control (12 classes)
2. Gain the applied knowledge of integrating sensors, actuators and controllers for mobile robot applications. (8 classes)
3. Gain the applied knowledge of industrial robot programming. (4 classes)

10. METHODS OF ASSESSMENT:

<table>
<thead>
<tr>
<th>Quiz and special HW</th>
<th>√</th>
<th>Students Course Outcome Evaluations</th>
</tr>
</thead>
<tbody>
<tr>
<td>√ Graded Exams</td>
<td>√</td>
<td>Faculty Course Assessment</td>
</tr>
<tr>
<td>√ Graded HW</td>
<td></td>
<td>Sample FE Exam</td>
</tr>
<tr>
<td>√ Design Projects</td>
<td>√</td>
<td>Instructor Judgment</td>
</tr>
<tr>
<td>√ Reports</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. STUDENT OUTCOME ADDRESSED:

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
<th>k</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>M</td>
<td>H</td>
<td>M</td>
<td>M</td>
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<td></td>
<td>h</td>
<td>i</td>
<td>j</td>
<td>H</td>
</tr>
</tbody>
</table>

L (Low): The outcome somewhat contributes to the achievement of the course objectives
M (Medium): The outcome contributes reasonably to the achievement of the course objectives
H (High): The outcome strongly contributes to the achievement of the course objectives

J. GRADING:

- **Homework** 12%
- **Labs** 15%
- **Midterm Exam** 20%
- **Final Exam** 30%
- **Mobile Robot Project** 12%
- **ABB Industrial Robot Project** 8%
- **Attendance** 3%

The grades from all work will be weighted as given in the table below, totaled, and converted into the Wilkes 4.0 scale grading system using the conversion table following.

<table>
<thead>
<tr>
<th>Grade Range</th>
<th>Wilkes Grade</th>
</tr>
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<tbody>
<tr>
<td>93+</td>
<td>4.0</td>
</tr>
<tr>
<td>88-92</td>
<td>3.5</td>
</tr>
<tr>
<td>83-87</td>
<td>3.0</td>
</tr>
<tr>
<td>77-82</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Revised 4/17/2018
K. **ATTENDANCE:**
Attendance is mandatory. Attendance will be taken every class meeting. Students are required to be in class before the normal class starting time. A student will be marked ‘tardy’ if not in class within 5 minutes of the class starting time. A student will be marked ‘absent’ if not in class within 10 minutes of class starting time. Each two ‘tardy’ instances will be considered as an absence. One absence will result in a 0.5% deduction from your attendance grade. There is a minimum attendance requirement for this course. Un-excused absences from labs/tests/exams and failure to attend required number of classes may result in failing grades. It is students’ responsibility to keep abreast of class procedural announcements. The course materials and the changes (if any) in schedule for quizzes/tests will also be posted regularly in Wilkes LIVE. Cell phones and mobile devices will not be allowed for texting/communication in the class. Note: I understand that emergencies do arise, and unusual situations will be evaluated on a case by case basis.

L. **HOMEWORK:**
Homework will provide an opportunity to master the concepts introduced in the lecture material. Homework assignments must be turned in prior to the beginning of the class in which they are due. No late homework will be accepted unless an official absence certificate can be provided. Homework is an essential part of learning this material and your grade. If you are having problems with the homework, see the instructor as soon as possible.

M. **EXAMINATIONS**
There will be six hands-on labs, two course projects, midterm and final exams. The cumulative final exam will be during the final exam period. There will be no make up final exam unless in extraordinary cases (e.g. medical emergency etc.).

N. **COURSE PROJECTS**
In the ABB Industrial Robot Project, students will program an industrial ABB robot that is widely used in industrial automation systems. In the Mobile Robot Project, students will design, build and test an autonomous mobile robot using sensors as feedback to carry out intelligent tasks. Details for the course projects will be provided during the semester.

O. **ACADEMIC HONESTY**
The highest level of academic honesty is expected of all Wilkes students. While cooperation is encouraged on course material learning, unique and individual efforts must be demonstrated for evaluation. Individual efforts on homework/tests/project and the exams are demanded.