**Ogden College of Science and Engineering**

**Office of the Dean**

**745-4449**

**REPORT TO THE UNIVERSITY CURRICULUM COMMITTEE**

Date: January 17, 2013

The Ogden College of Science and Engineering submits the following action items for consideration at the January 2012, UCC meeting:

1. New Business

|  |  |
| --- | --- |
| **Type of item** | **Description of Item & Contact Information** |
| Action | **Create a New Course**CE 301, Field Experience in Floodplain ManagementContact: Warren Campbell, warren.campbell@wku.edu, x58988 |
| Action | **Create a New Course**ME 332, Fluid Mechanics LaboratoryContact: Joel Lenoir, joel.lenoir@wku.edu, x56858 |
| Action | **Create a New Course**ME 333, Heat Transfer LaboratoryContact: Joel Lenoir, joel.lenoir@wku.edu, x56858 |
| Action | **Make Multiple Revisions to a Course**ME 176, Mechanical Engineering Freshman DesignContact: Joel Lenoir, joel.lenoir@wku.edu, x56858 |
| Action | **Revise a Program**Ref. #361, Minor in Floodplain ManagementContact: Warren Campbell, warren.campbell@wku.edu, x58988 |
| Action | **Revise a Program**Ref. #543, Mechanical engineeringContact: Joel Lenoir, joel.lenoir@wku.edu, x56858 |

Proposal Date: 11/09/2012

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Create a New Course**

**(Action Item)**

Contact Person: Warren Campbell, warren.campbell@wku.edu, 5-8988

**1. Identification of proposed course:**

* 1. Course prefix (subject area) and number: CE 301
	2. Course title: Field Experience in Floodplain Management
	3. Abbreviated course title: Field Exp Floodplain Mgmt
	4. Credit hours and contact hours:3 credit hours 50 contact hours
	5. Type of course: C
	6. Prerequisites/corequisites: Junior standing
	7. Course catalog listing: Field study and mitigation techniques for river flooding, karst flooding, flash flooding, alluvial fan flooding, tropical storms or a combination of these. Course involves travel.

**2. Rationale:**

* 1. Reason for developing the proposed course: This course was delivered as a selected topics course once, and is being offered again in January 2013. It provides students interested in water resources and floodplain management the opportunity to see the subjects of lectures, meet and learn from professionals working in the field, network with potential employers, and learn in a way that is impossible in the classroom. One student in the 2012 Study Away course said that he learned more in two weeks than in a year in the classroom.
	2. Projected enrollment in the proposed course: 8 to 12 per year, based on previous offerings
	3. Relationship of the proposed course to courses now offered by the department: CE 301 shares some content with CE 300 Floodplain Management, but CE 300 focuses on floodplain regulations and minimally on floodplain science. CE 301 will focus on floodplain science, flood history, and practical administration of floodplain programs.
	4. Relationship of the proposed course to courses offered in other departments: This course will have some overlap with the following courses: GEOG 121 Meteorology, GEOG 207 Hurricanes, GEOG 208 Floods and Droughts, GEOG 209/209C Natural Disasters, GEOG 420 Geomorphology, GEOG 421 Advanced Geomorphology, GEOG 427 Water Resources, and GEOG 461 Karst Environments. The overlap with any one course is minimal.
	5. Relationship of the proposed course to courses offered in other institutions: Only a few universities offer courses in floodplain management. Some that do include the University of Washington, the University of Tennessee, and the University of North Texas. However, none of these courses is field based; we believe that our course is unique in the United.States.

**3. Discussion of proposed course:**

* 1. Course objectives: The course will introduce students to flood mitigation approaches that have been successful and those that have failed. Students will develop an appreciation for physical, economic, and emotional tolls of flooding. They will learn the politics of flood response, water law, and ethics. In flood mitigation and water resources management they will learn approaches to emulate and those to avoid.
	2. Content outline: The outline varies from one offering to the next. The following is an abbreviated example from the CE 475 Total Immersion Floodplain Management Course.
* Maricopa County, Arizona Flood Control District: one day of presentations by staff, half day of field trip led by staff of the flood control district.
* Boulder City and Hoover Dam

 Boulder City tour (built for workers of Hoover Dam) (2 hours)

 Hoover Dam tours and lectures (6 hours)

* Clark County Flood Control District

 Presentations by flood control district staff (1/2 day)

 Field trip (1/2 day)

* Death Valley

 Field trip: alluvial fans, tectonics and climate change (4 hours)

 Field trip: alluvial fans, canyon tours, endangered species habitat (1 day)

* Los Angeles Aqueduct and the California Water Wars

 Lone Pine, the aqueduct, and center of unrest (2 hours)

 Site of Saint Francis Dam Disaster (4 hours)

* Salton Sea (150 square mile) lake created by floods on the Colorado River in the early 1900s and the San Andreas Fault zone (1 hour)
* Anza Borrego Desert Park field trip: alluvial fan flooding and debris flows (4 hours)
* Large detention pond tour: Hansen Dam in Los Angeles (2 hours)
* Alluvial fan flood solution, Magnesia Canyon debris basin, Rancho Mirage, California field trip (2 hours)
* Whitewater River stream gage and field trip: Indio, California (1 hour)
* Tide pools and ecosystems tour: La Jolla, California (3 hours)
* Cliff erosion and ocean swell physics (8 hours)
	1. Student expectations and requirements: Instructor evaluates students’ journals and Op Ed pieces related to issues observed during the course. Students are required to display professional behavior in all interactions with hosts during the tour. They are graded on course participation, which includes asking good questions of our hosts and the instructor, and participating actively in discussions. Sometimes the course also will require lab experiences such as measuring stream flow rates and/or measuring stream suspended loads and bed load.
	2. Tentative texts and course materials: For the 2012 course, I provided a set of notes, and no text was required. For the 2013 course, the required text is *The Great Deluge* by historian Douglas Brinkley, which deals with events leading up to, during and following Hurricane Katrina. Notes and text requirements will depend on the specific sites visited during the course.

**4. Resources:**

* 1. Library resources: None required
	2. Computer resources: None required. Personal lap top or tablet desirable.

**5. Budget implications:**

* 1. Proposed method of staffing: Offered during Summer or Winter terms by existing faculty. Will not conflict with any required or elective courses during the Fall and Spring terms.
	2. Special equipment needed: Varies from offering to offering, but may include current meters, pH, conductivity, and dissolved oxygen probes (owned by the Department)
	3. Expendable materials needed: None
	4. Laboratory materials needed: None

**6. Proposed term for implementation:** Fall 2013

**7. Dates of prior committee approvals:**

EngineeringDepartment: 11/13/2012\_\_\_\_\_\_\_\_\_

 Ogden College Curriculum Committee 12/06/2012\_\_\_\_\_\_\_\_\_

 Undergraduate Curriculum Committee \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 University Senate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Attachment: Bibliography, Library Resources Form**, **Course Inventory Form**

Proposal Date: 10/26/12

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Create a New Course**

**(Action Item)**

Contact Person: Joel Lenoir, joel.lenoir@wku.edu, 270-745-6858

**1. Identification of proposed course:**

* 1. Course prefix (subject area) and number: ME 332
	2. Course title: Fluid Mechanics Laboratory
	3. Abbreviated course title: Fluid Mechanics Laboratory
	4. Credit hours and contact hours: 1
	5. Type of course: B, Lab
	6. Corequisites: ME 330
	7. Course catalog listing:

An applied laboratory in the modeling, prediction, and measurement of fluid mechanics components and systems, with emphasis on the preparation of engineering reports, uncertainty analysis, and the experimental design plan process. System level experiments include fluid property measurements, pipe flow and turbomachinery characteristics.

**2. Rationale:**

* 1. Reason for developing the proposed course:

The topical coverage of the to-be suspended ME 440 Thermal Fluid Systems Laboratory is being divided into two labs, coupled to their respective engineering science courses. ME 332 will be coupled in spring semesters with ME 330 Fluid Mechanics, and ME 333 will be coupled in fall semesters with ME 325 Heat Transfer. Both lab courses will also retain some of the design of experiments plan material from ME 440. ME 332 provides the student with a direct linkage to ME 330 and creates a more integrated and streamlined ME junior year in engineering laboratory practices. The course focuses on fluid mechanics and supports the ABET requirement of a balance between both stems of the curriculum.

* 1. Projected enrollment in the proposed course: 24 based on current enrollments in ME 330.
	2. Relationship of the proposed course to courses now offered by the department:

As outlined in 2.1, this course contains the fluid mechanics topics from ME 440 and provides laboratory experiences to enhance ME 330.

* 1. Relationship of the proposed course to courses offered in other departments: None
	2. Relationship of the proposed course to courses offered in other institutions:

Similar laboratory courses are offered at numerous institutions as stand-alone fluid mechanics laboratories. Other institutions also couple a discrete laboratory course with a specific fluid mechanics engineering science lecture course.

Examples include:

 Purdue University: ME31900: Fluids Mechanics Lab, 1 hr. credit

 University of Memphis: ME 3335: Fluid Mechanics Lab, 1 hr credit.

 California Polytechnic State University: ME 347: Combined Fluid Mechanics and Lab, 4 hrs.

**3. Discussion of proposed course:**

* 1. Course objectives:

Equip students to plan, conduct, and evaluate the results of measurement and testing of fluid mechanics systems as well as develop the capability to produce professional engineering reports. The basic theory and objective of each experiment, including the theory and application of fluid measurements and instrumentation, is presented. Students will apply and compare fundamental knowledge of fluid mechanics, and at times thermodynamics, to experimental results.

* 1. Content outline:

Design of Experiments Plan Topics:

* Experimental planning
* Methods of measurement
* Selection of instrumentation
* Prediction of uncertainty
* Analysis of data and results
* Estimation of error
* Reporting of experimental results

List of Selected Experiments:

* Viscosity of a fluid
* Fluid flow measurements
* Fluid Bernoulli test bed – conservation of energy
* Impact of a jet – momentum transfer
* Hydrostatic forces on planar and curved surfaces
* Viscous internal flow – laminar and turbulent regimes
* Pump characteristics and similarity
	1. Student expectations and requirements:

Students are expected to plan, conduct, and evaluate the results of measurement and testing of fluid mechanics systems as well as develop the capability to produce professional engineering reports, all of which will be evaluated by the instructor.

* 1. Tentative texts and course materials:

No required textbook. Laboratory handouts will be provided. Textbooks used in ME220, ME 310 and ME 330 will serve as reference sources for the course.

**4. Resources:**

* 1. Library resources: None
	2. Computer resources: Computer hardware and software are available in the thermal fluids laboratory and ME student design center to support the course.

**5. Budget implications:**

* 1. Proposed method of staffing: Current staffing adequate
	2. Special equipment needed: None
	3. Expendable materials needed: Limited and currently managed through foundation funds
	4. Laboratory materials needed: Limited and currently managed through foundation funds

**6. Proposed term for implementation: Spring 2014**

**7. Dates of prior committee approvals:**

 Engineering Department: 15 Nov. 2012

 OCSE Curriculum Committee 06 Dec. 2012

 Undergraduate Curriculum Committee \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 University Senate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Attachment: Bibliography, Library Resources Form**, **Course Inventory Form**

Proposal Date: 11/8/12

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Create a New Course**

**(Action Item)**

Contact Person: Joel Lenoir, joel.lenoir@wku.edu, 270-745-6858

**1. Identification of proposed course:**

* 1. Course prefix (subject area) and number: ME 333
	2. Course title: Heat Transfer Laboratory
	3. Abbreviated course title: Heat Transfer Laboratory
	4. Credit hours and contact hours: 1
	5. Type of course: B, Lab
	6. Corequisites: ME 325
	7. Course catalog listing:

An applied laboratory in the modeling, prediction, and measurement of fluid mechanics components and systems, with emphasis on the preparation of engineering reports, uncertainty analysis, and the experimental design plan process. System level experiments include heat transfer measurements and heat transfer component characteristics.

**2. Rationale:**

* 1. Reason for developing the proposed course:

The topical coverage of the to-be suspended ME 440 Thermal Fluid Systems Laboratory is being divided into two labs, coupled to their respective engineering science courses. ME 332 will be coupled in spring semesters with ME 330 Fluid Mechanics, and ME 333 will be coupled in fall semesters with ME 325 Heat Transfer. Both lab courses will also retain some of the design of experiments plan material from ME 440. ME 333 provides the student with a direct linkage to ME 325 and creates a more integrated and streamlined ME senior year in engineering laboratory practices. The course focuses on heat transfer and supports the ABET requirement of a balance between both stems of the curriculum.

* 1. Projected enrollment in the proposed course: 24 based on the current enrollments in ME 325.
	2. Relationship of the proposed course to courses now offered by the department:

As outlined in 2.1, this course contains the heat transfer topics from ME 440 and provides laboratory experiences to enhance ME 325.

* 1. Relationship of the proposed course to courses offered in other departments: None
	2. Relationship of the proposed course to courses offered in other institutions:

Similar laboratory courses are offered at numerous institutions as stand-alone fluid mechanics laboratories. Other institutions also couple a discrete laboratory course with a specific fluid mechanics engineering science lecture course. Examples include:
 Purdue University: ME32200: Heat Transfer Lab, 1 hr. credit

 University of Memphis: ME 3355: Thermo/Heat Transfer Lab, 1 hr credit.

 California Polytechnic State University: ME 346: Heat Transfer and Thermodynamics Lab, 1 hr.

**3. Discussion of proposed course:**

* 1. Course objectives:

Equip students to plan, conduct, and evaluate the results of measurement and testing of thermal-fluid systems as well as develop the capability to produce professional engineering reports. The basic theory and objective of each experiment, including the theory and application of thermal-fluid measurements and instrumentation, is presented in lectures either in the lab or during the ME325 class. Students will apply and compare fundamental knowledge of heat transfer, and at times thermodynamics and fluid mechanics, to experimental results.

* 1. Content outline:

Design of Experiments Plan Topics:

* Experimental planning
* Methods of measurement
* Selection of instrumentation
* Prediction of uncertainty
* Analysis of data and results
* Estimation of error
* Reporting of experimental results

List of Selected Experiments:

* Thermodynamic 1st Law application
* Pipe-in-pipe, shell & tube, and plate & frame heat exchangers
* Conduction heat transfer experiment
* Convection heat transfer experiment
* Radiation heat transfer experiment
* Vapor compression cycles – refrigeration and heat pump
	1. Student expectations and requirements:

Students are expected to plan, conduct, and evaluate the results of measurement and testing of fluid mechanics systems as well as develop the capability to produce professional engineering reports, all of which will be evaluated by the instructor.

* 1. Tentative texts and course materials:

No required textbook. Laboratory handouts will be provided. Textbooks used in ME220, ME 310, ME 325 and ME330 will serve as reference sources for the course.

**4. Resources:**

* 1. Library resources: None
	2. Computer resources: Computer hardware and software are available in the thermal fluids laboratory and ME student design center to support the course.

**5. Budget implications:**

* 1. Proposed method of staffing: Current staffing adequate
	2. Special equipment needed: None
	3. Expendable materials needed: Limited and currently managed through foundation funds
	4. Laboratory materials needed: Limited and currently managed through foundation funds

**6. Proposed term for implementation: Spring 2014**

**7. Dates of prior committee approvals:**

Engineering Department: 15 Nov. 2012

 OCSE Curriculum Committee 06 Dec. 2012

 Undergraduate Curriculum Committee \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 University Senate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Attachment: Bibliography, Library Resources Form**, **Course Inventory Form**

Proposal Date: 10/26/12

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Make Multiple Revisions to a Course**

**(Action Item)**

Contact Person: Joel Lenoir, joel.lenoir@wku.edu, 745-6858

**1. Identification of course:**

* 1. Current course prefix (subject area) and number: ME 176
	2. Course title: Mechanical Engineering Freshman Design
	3. Credit hours: 1.0

**2. Revise course title: N/A**

* 1. Current course title:
	2. Proposed course title:
	3. Proposed abbreviated title:
	4. Rationale for revision of course title:

**3. Revise course number: N/A**

* 1. Current course number:
	2. Proposed course number:
	3. Rationale for revision of course number:

**4. Revise course prerequisites/corequisites/special requirements:**

4.1 Current prerequisites:

For transfer or change of major students who have earned at least 24 semester hours of credit or have completed a course equivalent to the basic topics of the generic WKU University Experience

4.2 Proposed prerequisites:

 MATH 116 or higher

4.3 Rationale for revision of course prerequisites:

The original prerequisite was intended to limit this course to transfer and change-of-major students when a program-specific University Experience course was in place. The Department of Engineering has moved to an optional ENGR 175 University Experience – Engineering course. ME 176 is now to be required to ensure each ME student has the foundational course in engineering design as well as the basic departmental safety training.

4.4 Effect on completion of major/minor sequence:

None, the program has always accepted either ME 175 or 176 for credit.

**5. Revise course catalog listing:**

* 1. Current course catalog listing:

An introduction to Mechanical Engineering. The design process and basic professional tools are introduced through multiple projects. A replacement for ME 175 for transfer or change of major students. Permission of instructor only. Course Fee

* 1. Proposed course catalog listing:

An introduction to Mechanical Engineering. The design process and basic professional tools are introduced through multiple projects. Course fee.

* 1. Rationale for revision of course catalog listing:

The catalog listing is being changed to remove the transfer/change of major intent of the course; no topical changes are being made to the course.

**6. Revise course credit hours: N/A**

* 1. Current course credit hours:
	2. Proposed course credit hours:
	3. Rationale for revision of course credit hours:

**7. Proposed term for implementation: Fall 2012**

**8. Dates of prior committee approvals:**

Department of Engineering 15 Nov. 2012

 OCSE Curriculum Committee 06 Dec. 2012

 University Curriculum Committee

 University Senate

**Attachment: Course Inventory Form**

Proposal Date: 11/09/2012

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Revise A Program**

**(Action Item)**

Contact Person: Warren Campbell, warren.campbell@wku.edu, 5-8988

**1. Identification of program:**

* 1. Current program reference number: 361
	2. Current program title: Minor in Floodplain Management
	3. Credit hours: 22

**2. Identification of the proposed program changes:**

Changes include adding courses to the list of electives and changing one required course.

**3. Detailed program description:**

|  |  |
| --- | --- |
| Required Courses in Existing Curriculum | Proposed Courses In new Curriculum |
| CE 160/161  | CE 160/161 |
| CE 300 | CE 300 |
| **GEOG 317 or GEOG 318** | **GEOG 316** |
| CE 461 or GEOG/GEOL 310 | CE 461 or GEOG/GEOL 310 |
|   |
| Elective Courses | Elective Courses |
| GEOG 121, 207, 208, 209, 391, 414, 433, 416 | GEOG 121, 207, 208, 209, 391, 414, 433, 416 |
| GEOG 417, 419, 437, and 438 | GEOG **317**, **318,** 417, 419, 437, 438  |
| GEOG/GEOL 420, GEOG 422, 424, 426, 427  | GEOG/GEOL 420, GEOG 422, 424, 426, 427  |
| GEOG 431, 445, 455, 474, 477 | GEOG 431, 445, 455, 474, 477 |
| GEOL 111, 113, CE 351, CE 380/381, CE 461 | GEOL 111, 113, CE 351, CE 380/381, CE 461 |
| CE 480/481 | CE 480/481, **CE 301** |
|   | **JOUR 201, 202** |

**4. Rationale for the proposed program change:**

Regarding the change from GEOG 317 and 318 to 316, these courses have been rearranged so that an engineering student can no longer take GEOG 317 without 316. These have been moved to electives. CE 301 Field Experience in Floodplain Management is a new course. Regarding the journalism classes, the Association of State Floodplain Managers, the largest U.S. floodplain management professional society surveyed its members two years ago. This survey had more than 1200 respondents and it indicated that floodplain managers often must deal with media. Having an understanding of how media affect public perceptions and understanding how media outlets operate is useful to floodplain managers.

**5. Proposed term for implementation:** Fall 2013

**6. Dates of prior committee approvals:**

EngineeringDepartment: 11/13/2012\_\_\_\_\_\_\_\_\_

 Ogden College Curriculum Committee 12/06/2012\_\_\_\_\_\_\_\_\_

 Undergraduate Curriculum Committee \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 University Senate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Proposal Date: 10/18/2012

#### Ogden College of Science and Engineering

**Department of Engineering**

**Proposal to Revise a Program**

**(Action Item)**

Contact Person: Joel Lenoir email: joel.lenoir@wku.edu, 745-6858

**1. Identification of program**

# Reference Number: 543

* 1. Current Program Title: Mechanical Engineering
	2. Credit Hours: 60.5
1. **Identification of proposed changes**

**Courses and Curriculum**

* Remove the option of ME 175 or 176 and replace with ME 176 only
* Replace existing chemistry sequence CHEM 120/121 with the sequences CHEM 116/106 or 120/121
* Replace the existing required mathematics elective with a mathematics/science elective chosen from a list, with a required minimum of 32 hours of mathematics and science beginning with MATH 136
* Replace the required electrical engineering course EE 350 with EE 210
* Delete the currently required courses ME 285 and ME 416 from the program
* Replace the required ME 321 with an additional technical elective for a total of four
* Replace the two upper division lab courses ME 440/445 with new labs ME 332/333

Credit Hours:Program required technical course hours change from 68 hours to 60.5 hours. Other required mathematics and science hours will change from a fixed 33 hours to a minimum of 32 hours. Students are required to satisfy the WKU General Education requirements.

**Program Academic Policy**

Revision of Program Academic Standards: Removing HIST 119/120 from the Pre-Major requirements. Addition of EM 221, MATH 237, and PHYS 265/266 to the list of required courses. Inclusion of CHEM 116/106 as an option to CHEM 120/121. Replacement of mathematics elective with a list of mathematics and science electives.

**Catalog statement of existing policy:**

Academic Standards for the WKU/UK Joint Mechanical Engineering Program:

Students are admitted as a Pre-Major in Mechanical Engineering. In order to transition from Pre-Major to Major and to graduate with a degree in Mechanical Engineering, students must earn a GPA of 2.5 in the following courses and a grade of "C" or better in each course in the list. This requirement must be completed before enrolling in ME 300: Junior Design.

ME 175: University Experience 2/1hrs (or ME 176 for transfers)

ENG 100: Freshman English 3 hrs

HIST 119 or 120: Western Civilization 3 hrs

COMM 145 or 161: 3 hrs

MATH 136: Calculus and Analytic Geometry I 4 hrs

MATH 137: Calculus and Analytic Geometry II 4 hrs

ME 180: Freshman Design II 3 hrs

PHYS 255/256: University Physics I and Laboratory 5 hrs

CHEM 120/121: College Chemistry I and Laboratory 5 hrs

ME 240/241: Materials and Methods of Manufacturing 4 hrs

TOTAL HRS 36/35 hrs

After satisfying the requirements to transition from Pre-Major to Major in Mechanical Engineering, the student must also earn a grade of C or better in the following courses required of the major: EM 221, 303, ME 200, 220, 310, 330, 347, MATH 237, MATH 331.

Each Mechanical Engineering student’s transcript must include at least 16 hours of credit in the major taught by UK faculty members.

Each Mechanical Engineering student must also take at least one mathematics elective. This elective must meet three criteria:

 - It must be a course offered by the Department of Mathematics

- It must not be a course repeating subject matter already covered in a required course.

- It must be of a level greater than or equal to the required courses in mathematics.

**Catalog statement of proposed policy:**

Academic Standards for the WKU/UK Joint Mechanical Engineering Program:

Students are admitted as a Pre-Major in Mechanical Engineering. In order to transition from Pre-Major to Major and to graduate with a degree in Mechanical Engineering, students must satisfy the requirements below. All courses listed below must have a grade of C or better.

Written and Oral Communication

- ENG 100 or equivalent credit 3 hrs.

- COMM 145 or 161 or equivalent credit 3 hrs.

Engineering Design

ME 176: Mechanical Engineering Freshman Design 1 hr.

ME 180: Freshman Design II 3 hrs.

Mathematics and Science

- MATH 136: Calculus I or equivalent credit 4 hrs.

- MATH 137: Calculus II or equivalent credit 4 hrs.

- MATH 237: Multivariable Calculus 4 hrs.

- PHYS 255/256: University Physics I/LAB 5 hrs.

- PHYS 265/266: University Physics II/LAB 5 hrs.

- CHEM 116/106 or CHEM 120/121 4 or 5 hrs.

Engineering Science

- ME 240/241: Materials and Methods of Manufacturing 3/1 hrs.

- EM 221 or EM 222: Statics 3 hrs.

 TOTAL HOURS: 43 or 44 hours

These Pre-Major eligibility requirements MUST be completed before enrolling ME 300: Junior Design. Check iCAP for progress towards meeting these requirements.

After satisfying the requirements to transition from Pre-Major to Major in Mechanical Engineering, the student must also earn a grade of C or better in the following courses required of the major: EM 303, ME 200, 220, 310, 330, 347, and MATH 331.

Each Mechanical Engineering student’s transcript must include at least 16 hours of credit in the major taught by UK faculty members.

Each Mechanical Engineering student must also take at least one mathematics/science elective, for a total of a minimum of 32 hours of mathematics and science beginning at MATH 136. This elective must be chosen from the following list :

- PH 280: INTRODUCTION TO ENVIRONMENTAL SCIENCE. (Equivalent to AGRI 280, CHEM 280, ENV 280, and GEOG 280)

- ASTR 214: GENERAL ASTRONOMY

- BIOL 120/121: BIOLOGICAL CONCEPTS: CELLS METABOLISM AND GENETICS

- BIOL 122/123: BIOLOGICAL CONCEPTS: EVOLUTION, DIVERSITY, AND ECOLOGY

- BIOL 207/207C: GENERAL MICROBIOLOGY

- CHEM 222/223: COLLEGE CHEMISTRY II

- GEOG 121: METEOROLOGY

- GEOL 111: THE EARTH

- GEOL 112: EARTH HISTORY

- PHYS 316: COMPUTATIONAL PHYSICS

- PHYS 318: DATA ACQUISITION USING LABVIEW

- PHYS 320: INTRODUCTORY MODERN PHYSICS I

- MATH 305: INTRODUCTION TO MATHEMATICAL MODELING

- MATH 307: INTRODUCTION TO LINEAR ALGEBRA

- MATH 310: INTRODUCTION TO DISCRETE MATHEMATICS

- MATH 370: APPLIED TECHNIQUES IN MATHEMATICS

- STAT 301: INTRODUCTORY PROBABILITY AND APPLIED STATISTICS

**3. Detailed program description:**

|  |  |
| --- | --- |
| **Current Technical Courses** **ME175 University Experience – ME**  **or ME 176 Freshman Design 2 or 1** **(transfers/change majors, credits > 24 hrs)**ME 180 Freshman Design II 3ME 240 Materials and Methods 3ME 241 Materials and Methods LAB 1EM 221 UK Statics 3**EE 350 Fundamentals of El. Engr. 4**ME 285 Fundamentals Ind. Auto. 1ME 200 Sophomore Design 3EM 313 Dynamics 3EM 303 WKU Mechs. of D. Solids 3ME 347 Mech. Systems Lab. 1ME 220 Engineering Thermo. I 3ME 344 Mechanical Design 3ME 300 Junior Design 2ME 310 Eng. Instru. & Exp. 3**ME 321 Eng. Thermo. II 3**ME 330 Fluid Mechanics 3ME 325 Heat Transfer 3**ME 416 UK Dyn. Systems Elective 3**ME 400 Mech. Engr. Design 2**ME 440 Therm/Fluids Lab 2****ME 445 Dynamic Systems Lab 2**ME 412 ME Senior Project 3ME Technical Elective 3ME Technical Elective 3ME Technical Elective 3Technical Course Total: 68 or 67 **Other Requirements:**CHEM 120 College Chemistry 1 4**CHEM 121 College Chemistry I Lab 1**PHYS 255 University Physics I 4PHYS 256 University Physics I Lab 1PHYS 265 University Physics II 4PHYS 266 University Physics II Lab 1 1MATH 136 Calculus I 4MATH 137 Calculus II 4MATH 237 Multivariable Calculus 4MATH 331 Differential Equations 3**Mathematics Elective 3** **Other Required** **Mathematics** **and Science Hours: 33** **Students must also satisfy the WKU General Education requirements** | **Proposed Technical Courses****ME176 Freshman Design 1**ME 180 Freshman Design II 3ME 240 Materials and Methods 3ME 241 Materials and Methods LAB 1EM 221 UK Statics 3**EE 210 Circuits & Networks I 3.5**ME 200 Sophomore Design 3EM 313 Dynamics 3EM 303 WKU Mechs. of Def. Solids 3ME 347 Mech. Systems Lab. 1ME 220 Engineering Thermo. I 3ME 344 Mechanical Design 3ME 300 Junior Design 2ME 310 Eng. Instru. & Exp. 3**ME Technical Elective 3**ME 330 Fluid Mechanics 3ME 325 Heat Transfer 3ME 400 Mech. Engr. Design 2**ME 332 Fluid Mechanics Laboratory 1****ME 333 Heat Transfer Laboratory 1**ME 412 ME Senior Project 3ME Technical Elective 3ME Technical Elective 3ME Technical Elective 3Technical Course Total: 60.5 **Other Requirements:**CHEM 120/121 College Chem 1/Lab 5 ***OR* CHEM 116/106 Int Coll Chem/Lab 4**PHYS 255 University Physics I 4PHYS 256 University Physics I Lab 1PHYS 265 University Physics II 4PHYS 266 University Physics II Lab 1 1MATH 136 Calculus I 4MATH 137 Calculus II 4MATH 237 Multivariable Calculus 4MATH 331 Differential Equations 3**Mathematics/Science Elective 3****Other Required** **Mathematics** and Science Hours: A minimum of 32 hours beginning with MATH 136 Students must also satisfy the WKU General Education requirements  |
|  |  |

**4. Rationale of proposed program revisions:**

* Remove the option of ME 175 or 176 and replace with ME 176 only

The ME program has moved away from a required ME 175 University Experience course for new students. The existing ME 176, which was originally the option for transfer and change-of-major students, will now be the beginning course in the program. The department has an optional ENGR 175 for those students desiring a University Experience course in engineering.

* Replace existing chemistry sequence CHEM 120/121 with the sequences CHEM 116/106 or 120/121

The accreditation agency for engineering, ABET, has recently modified the mathematics and science requirements for mechanical engineering. The requirement of a minimum of 32 hours of mathematics and science remains, with Calculus I and II, Multivariable Calculus, and Differential Equations being the only specified courses. Programs are able to specify the appropriate science courses to support the program. An overall review of the program outcomes supports the addition of CHEM 116/106 as an option to 120/121. Students placing directly into 120/121 via the placement test will be encouraged to take those courses.

* Replace the existing required mathematics elective with a mathematics/science elective

This change will broaden choice for students planning their post-baccalaureate options. The list shown above give a wide range of choices, but a minimum of 32 hours of mathematics and science beginning with MATH 136 will be required.

* Replace the required electrical engineering course EE 350 with EE 210

EE 350 was an annual course offered only to ME students. EE 210 is already offered each term to both ME and EE students, providing efficiency to the department while still providing an acceptable level of coverage of circuits and networks for the ME students.

* Delete the currently required courses ME 285 and ME 416 from the program

The experiences of ME 285 have been included in an existing project in ME 200, and thus the course has become redundant. The topics in ME 416 are better covered in a technical elective rather than in a required course.

* Replace the required ME 321 with an additional technical elective for a total of four

The course is similar to ME 416 above in that it is more appropriate as a technical elective. The credit hours will be retained in a new additional technical elective.

* Replace the two upper division lab courses ME 440/445 with new labs ME 332/333

The new lab courses are more efficient and sustainable since they are more closely aligned with existing courses rather than being unrelated standalone courses. Although the topics might be included as an element of a technical elective, they are not required in a typical ME program.

**5. Proposed term for implementation and special provisions:**

 **Term:** Fall 2013 (intended to appear in 2013-2014 catalog)

**6. Dates of prior committee approvals:**

Department of Engineering 15 Nov. 2012

 OCSE Curriculum Committee 06 Dec. 2012

 University Curriculum Committee

 University Senate