**Ogden College of Science and Engineering**

**Office of the Dean**

**745-4449**

**REPORT TO THE UNIVERSITY CURRICULUM COMMITTEE**

Date: November 12, 2013

The Ogden College of Science and Engineering submits the following action items for consideration at the November 2013, UCC meeting:

1. New Business

|  |  |
| --- | --- |
| **Type of item** | **Description of Item & Contact Information** |
| Action | **Proposal to Revise a Program**  Ref. #575, Technology Management, 63 hrs.  Contact: Daniel Jackson, [dan.jackson@wku.edu](mailto:dan.jackson@wku.edu) , x5955 |
| Action | **Proposal to Create a New Course**  CE 305, Risk Analysis, 3 hrs.  Contact: Warren Campbell, [warren.campbell@wku.edu](mailto:warren.campbell@wku.edu), x8988 |
| Action | **Proposal to Revise Course Credit Hours**  EE 180, Digital Circuits, 4 hrs.  Contact: Stacy Wilson, [stacy.wilson@wku.edu](mailto:stacy.wilson@wku.edu), x5848 |
| Action | **Proposal to Revise Course Credit Hours**  EE 200, Electrical Engineering Design II, 1 hr.  Contact: Farhad Ashrafzadeh, [farhad.Ashrafzadeh@wku.edu](mailto:farhad.Ashrafzadeh@wku.edu), x5877 |
| Action | **Proposal to Revise Course Credit Hours**  EE 431, Introduction to Power Systems, 3 hrs.  Contact: Walter Collett, [walter.collett@wku.edu](mailto:walter.collett@wku.edu), x2016 |
| Action | **Proposal to Revise Course Credit Hours**  EE 460, Continuous Control Systems, 4 hrs.  Contact: Stacy Wilson, [stacy.wilson@wku.edu](mailto:stacy.wilson@wku.edu), x5848 |
| Action | **Proposal to Revise a Program**  Ref. #537, Electrical Engineering, 57 hrs.  Contact: Mark Cambron, [mark.cambron@wku.edu](mailto:mark.cambron@wku.edu), x 8868 |

Proposal Date: September 6, 2013

**Ogden College of Science and Engineering**

**Department of Architectural and Manufacturing Sciences**

**Proposal to Revise a Program**

**(Action Item)**

Contact Person: Dr. Daniel Jackson ([dan.jackson@wku.edu](mailto:dan.jackson@wku.edu)) 745-5955

**1. Identification of program:**

* 1. Program reference number: 575
  2. Program title: Technology Management
  3. Credit hours: 63

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

Changes to Advanced Manufacturing Major

* Management Core – Remove ENG 307
* Management Core - Add the requirement of AMS 396: Supply Chain Management

**3. Detailed program description:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Technology Management (old) | 63 hours |  | Technology Management (new) | 63 hours |
|  |  |  |  |  |
| Management Core: |  |  | Management Core: |  |
| AMS 271: Industrial Statistics | 3 |  | AMS 271: Industrial Statistics | 3 |
| AMS 310: Work Design Ergonomics | 3 |  | AMS 310: Work Design Ergonomics | 3 |
| AMS 356: Systems Design and Operations | 3 |  | AMS 356: Systems Design and Operations | 3 |
| AMS 371: Quality Assurance | 3 |  | AMS 371: Quality Assurance | 3 |
| AMS 390: Project Management | 3 |  | AMS 390: Project Management | 3 |
| AMS 394: Lean Manufacturing | 3 |  | AMS 394: Lean Manufacturing | 3 |
| AMS 430: Tech Mgmt/Supervision/Team Bldg | 3 |  | AMS 430: Tech Mgmt/Supervision/Team Bldg | 3 |
| AMS 490: Senior Research | 3 |  | AMS 490: Senior Research | 3 |
|  |  |  |  |  |
| **ENG 307: Technical Writing** | **3** |  | **AMS 396: Supply Chain Management** | **3** |
|  |  |  |  |  |
| Advisor Approved Upper Division Electives | 12 |  | Advisor Approved Upper Division Electives | 12 |
|  |  |  |  |  |
| Technical Core Transfer | 24 |  | Technical Core Transfer | 24 |

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

Changes to Technology Management Major

* Management Core – Remove ENG 307– writing across all levels of coursework has been initiated in the Technology Management coursework. This includes sessions on resume writing and technical memos.
* Management Core - Add the requirement of AMS 396: Supply Chain Management – This course links together aspects of manufacturing from acquiring raw materials and resources through production and delivery of a product. In recent years it has become a critical area of Technology Management.

**5. Effective Catalog Year:** 2014-2015

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

Architectural and Manufacturing SciencesDepartment: \_\_09/09/2013\_\_

OCSE Curriculum Committee \_\_\_11/07/2013\_

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

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

Proposal Date: August 20, 2013

**Ogden College**

**Department of Engineering**

**Proposal to Create a New Course**

**(Action Item)**

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

**1. Identification of proposed course:**

* 1. Course prefix (subject area) and number: CE 305
  2. Course title: Risk Analysis
  3. Abbreviated course title: Risk Analysis
  4. Credit hours and contact hours: 3
  5. Type of course: L
  6. Prerequisites: MATH 137
  7. Course catalog listing:

Uncertainty and methods for risk analysis for engineering systems including engineering economics, probabilistic and statistical methods, and Monte Carlo simulation with applications to civil, electrical, and mechanical engineering.

**2. Rationale:**

* 1. Reason for developing the proposed course: Creation of this course better prepares engineering students for the Fundamentals of Engineering (FE) Exam, the first step toward licensure. Success rate on the FE Exam is an assessment measure we use for accreditation documents. The course will also better prepare engineers for their careers by introducing a basic element of engineering practice: uncertainty, introducing the time value of money critical to financing any engineering project, and introducing optimization to improve engineering designs.
  2. Projected enrollment in the proposed course: 25 per year
  3. Relationship of the proposed course to courses now offered by the department: No relationship.
  4. Relationship of the proposed course to courses offered in other departments: It contains elements of STAT 301 and MATH 405.
  5. Relationship of the proposed course to courses offered in other institutions: A similar course is taught at the University of Southern California, Colorado State, the University of Alabama, MIT (graduate level), University of Maryland, and the Swiss Federal Institute of Technology.

**3. Discussion of proposed course:**

The course introduces basic tools in probability, statistics, and economic concepts that are applicable to the analysis of complex systems.

* 1. Course objectives: Engineers often confront problems that involve complex systems with uncertain and variable inputs. Upon completion of this course, students will understand the concept of the time value of money and how to use numerical modeling to make forecasts for unobserved conditions and determine strategies that might improve the behavior of the system. In addition they will know how to use probability and statistics as valuable tools to characterize uncertainty and its implications in terms of risk and failure for engineering projects.
  2. Content outline:
* Time value of money
* Optimization of engineering systems
* Basic computer programming and spreadsheet analysis with applications to civil engineering, electrical engineering, and mechanical engineering systems.
* Solution of engineering equations
* Probability distributions with engineering applications (binomial, Poisson, extreme value, log Pearson type III and others)
* Statistical hypothesis testing for engineering practice
* Uncertainty of variables and propagation through equations
* Sampling theory and Monte Carlo simulation
  1. Student expectations and requirements: Students will be evaluated using the following assessment tools: homework; exams including a final; and/or computer projects.
  2. Tentative texts and course materials:

An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements 2nd Edition by John R. Taylor (1997), and instructor notes and supplementary materials.

**4. Resources:**

* 1. Library resources: None required
  2. Computer resources: Computer lab (25 seats) with Microsoft Office suite

**5. Budget implications:**

* 1. Proposed method of staffing: Existing faculty will teach the course.
  2. Special equipment needed: None
  3. Expendable materials needed: Computer paper and printer ink.
  4. Laboratory materials needed: Computers

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

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

Engineering Department/Division: \_10/17/2013\_\_\_\_\_\_\_\_

Ogden College Curriculum Committee \_\_11/07/2013\_\_\_\_\_\_\_

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

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

**Attachment: Course Inventory Form**

Proposal Date: October 30, 2013

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Revise Course Credit Hours**

**(Action Item)**

Contact Person: Stacy Wilson, stacy.wilson@wku.edu, 745-5848

**1. Identification of course:**

* 1. Current course prefix (subject area) and number: EE 180
  2. Course title: Digital Circuits
  3. Credit hours: 4

**2. Proposed course credit hours: 3.0**

**3. Rationale for the revision of course credit hours:**

Currently, EE 180 is a four-credit-hour course, with three hours per week for lecture and two hours per week for laboratory. In addition, the co-requisite for the course is MATH 117. To lessen the significant load this course places on students and faculty, the lab component will be removed from EE 180, and the skills that students currently learn in the laboratory will be moved into EE 200.

**4. Proposed term for implementation: Fall 2014**

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

Engineering Department: \_\_\_\_10/31/2013\_\_\_\_\_

OSCE Curriculum Committee \_\_\_\_\_11/07/2013\_\_\_\_

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

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

**Attachment: Course Inventory Form**

Proposal Date: October 30, 2013

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Revise Course Credit Hours**

**(Action Item)**

Contact Person: Farhad Ashrafzadeh, [Farhad.Ashrafzadeh@wku.edu](mailto:Farhad.Ashrafzadeh@wku.edu), 745-5877

**1. Identification of course:**

* 1. Current course prefix (subject area) and number: EE 200
  2. Course title: Electrical Engineering Design II
  3. Credit hours: 1

**2. Proposed course credit hours:** 2

**3. Rationale for the revision of course credit hours:**

Currently, EE 200 is a 1.0 credit hour course that covers Matlab software and a circuit design project. The circuit breadboarding skills presented in EE 180 will be moved to EE 200 to achieve greater synergy between circuit design, prototyping, and fabrication. The additional 1.0 hour will also allow the expansion of the Matlab component.

**4. Proposed term for implementation:** Fall 2014

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

|  |  |
| --- | --- |
| Department of Engineering | **31 Oct 2013** |
| OSCE College Curriculum Committee | 11/07/2013 |
| Undergraduate Curriculum Committee |  |
| University Senate |  |

**Attachment: Course Inventory Form**

Proposal Date: October 30, 2013

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Revise Course Credit Hours**

**(Action Item)**

Contact Person: Walter Collett, walter.collett@wku.edu, 745-2016

**1. Identification of course:**

* 1. Current course prefix (subject area) and number: EE 431
  2. Course title: Introduction to Power Systems
  3. Credit hours: 3

**2. Proposed course credit hours: 3.5**

**3. Rationale for the revision of course credit hours:**

Currently, this course is a 3.0 credit hour course with 2.5 hours allocated to lecture, and the remaining 0.5 hour to lab (lab meeting two hours per week for approximately 0.5 the semester). The faculty desire to increase the lecture component of the course to 3.0 full hours while maintaining the 0.5 hour allocation to the lab component. This will allow greater time for examining important course topics while not reducing the amount of time spent in the lab.

**4. Proposed term for implementation: Fall 2014**

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

Engineering Department: \_\_\_31 Oct 2013\_\_\_\_\_

OSCE Curriculum Committee \_\_\_\_11/07/2013\_\_\_\_\_

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

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

**Attachment: Course Inventory Form**

Proposal Date: October 30, 2013

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Revise Course Credit Hours**

**(Action Item)**

Contact Person: Stacy Wilson, stacy.wilson@wku.edu, 745-5848

**1. Identification of course:**

* 1. Current course prefix (subject area) and number: EE 460
  2. Course title: Continuous Control Systems
  3. Credit hours: 4.0

**2. Proposed course credit hours: 3.5**

**3. Rationale for the revision of course credit hours:**

Currently, EE 460 is a 4.0 credit-hour course with 3.0 credit-hours dedicated to lecture and 1.0 credit-hour for a laboratory experience. This course has been taught in this format for several years and it has become apparent that a 1.0 hour laboratory experience is not necessary. There is little hardware available for in-lab experiences and the students have been performing simulations as part of the normal lecture component work. Therefore, the faculty proposes to decrease the lab portion of the course to 0.5 credit-hours, thereby reducing the number of credit-hours for the course to 3.5.

**4. Proposed term for implementation: Fall 2014**

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

Engineering Department: \_\_\_\_\_31 Oct 2013\_\_\_\_

OSCE Curriculum Committee \_\_\_\_\_11/07/2013\_\_\_\_

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

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

**Attachment: Course Inventory Form**

# Proposal Date: 10/1/2013

#### Ogden College of Science and Engineering

**Department of Engineering**

**Proposal to Revise a Program**

**(Action Item)**

Contact Person: Mark Cambron email: [mark.cambron@wku.edu](mailto:mark.cambron@wku.edu) phone: 5-8868

**1. Identification of program**

# Reference Number: 537

* 1. Current Program Title: Electrical Engineering
  2. Credit Hours: 57

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

* Remove ENGR 175, EE 175, UC 175 as a required course.
* Modify the numbers of credit-hours to reflect changes in EE 180, EE 200, EE 341, and EE 460.
* Change EE 405, EE 450, EE 451, EE 470, EE 475, and EE 479 from required courses to electives.
* Change the number of required EE Elective credit-hours from 6 to 12.
* Add MATH 370 to list of math electives.
* Add ENGR 400 to the listed of accepted Engineering/Science Electives.
* Decrease the number of credit-hours in program from 62 to 57.

**3. Detailed program description:**

|  |  |
| --- | --- |
| **Current Program**  ENGR 175 University Experience, and 1  EE 101 Design I 1  or  EE175 University Experience - EE 2  or  UC 175 University Experience, and 2  EE 101 Design I 1  EE180 Digital Circuits 4  EE200 Design II 1  EE210 Circuits & Networks I 3.5  EE211 Circuits & Networks II 3.5  EE300 Design III 1  EE345 Electronics 4  EE380 Microprocessors 4 EE400 Design IV 1  EE401 Senior Design 3  EE405 EE Senior Research Seminar 1  EE420 Signals & Linear Systems 3  EE431 Intro. to Power Systems 3  EE450 Digital Signal Proc. 3 EE451 Digital Signal Proc. Lab 1  EE460 Cont. Control Systems 4  EE470 Communications 3  EE473 EM Fields & Waves 3  **or**  PHYS 440 Electricity and Magnetism 3  EE475 Communications Lab 1  EE479 Fund. Of Optoelectronics 2  EE Technical Electives 6  Engineering/Science Electives 6 Tech. Course Total: 62 **Other Requirements**  MATH136 Calculus I 4  MATH137 Calculus II 4  MATH237 Multivariable Calculus 4  MATH331 Differential Equations 3  MATH350 Advanced Engr. Math 3  or  MATH307 Intro. Linear Algebra 3  STAT301 Probability & Statistics 3  PHYS255 University Physics I 4  PHYS256 University Physics I Lab 1  PHYS265 University Physics II 4  Science Elective 3  CS239 Prob Solving Comp Tech 3  ECON ECON 202 or ECON 203 3 **Other Hours: 39** | **Proposed Program**  ~~ENGR 175 University Experience, and~~  EE 101 Design I 1  ~~or~~  ~~EE175 University Experience - EE 2~~  ~~or~~  ~~UC 175 University Experience, and 2~~  ~~EE 101 Design I 1~~  **EE180 Digital Circuits 3**  **EE200 Design II 2**  EE210 Circuits & Networks I 3.5  EE211 Circuits & Networks II 3.5  EE300 Design III 1  EE345 Electronics 4  EE380 Microprocessors 4 EE400 Design IV 1  EE401 Senior Design 3  ~~EE405 EE Senior Research Seminar 0~~  EE420 Signals & Linear Systems 3  **EE431 Intro. to Power Systems 3.5**  ~~EE450 Digital Signal Proc. 3 EE451 Digital Signal Proc. Lab 1~~  **EE460 Cont. Control Systems 3.5**  ~~EE470 Communications 3~~  EE473 EM Fields & Waves 3  **or**  PHYS 440 Electricity and Magnetism 3  ~~EE475 Communications Lab 1~~  ~~EE479 Fund. Of Optoelectronics 2~~  **EE Technical Electives 12**  Engineering/Science Electives 6 Tech. Course Total: 57 **Other Requirements**  MATH136 Calculus I 4  MATH137 Calculus II 4  MATH237 Multivariable Calculus 4  MATH331 Differential Equations 3  ~~MATH350 Advanced Engr. Math 3~~  ~~or~~  ~~MATH307 Intro. Linear Algebra 3~~  **~~or~~**  **Math Elective 3**  STAT301 Probability & Statistics 3  PHYS255 University Physics I 4  PHYS256 University Physics I Lab 1  PHYS265 University Physics II 4  Science Elective 3  CS239 Prob Solving Comp Tech 3  ECON ECON 202 or ECON 203 3 **Other Hours: 39** |
|  |  |

Engineering/Science Electives (take at least 6 hours)

EM 221 or EM 222 or PHYS 350

ME 365 or ME 220 or PHYS 330

ME 240 Materials and Methods of Manufacturing

ME 330 or CE 341 or CE 342

PHYS 450 Classical Mechanics II

PHYS 318 Data Acquisition Using Labview

**ENGR 400 Principles of Systems Engineering**

EE Elective (take at least 12 hours)

**EE 405 EE Senior Research Seminar**

EE 410/411 Computer Design

EE 432 Power Systems II

EE 443 Microfabrication and Mems

EE 445 Advanced Electronics

**EE 450/451 Digital Signal Processing**

EE 461 Discrete Control Sys

EE 462 Special Topics in Control

**EE 470/475 Communications**

EE 477 Num Tech.

**EE 479 Fund. Of Optoelectronics**

EE 480 Embedded Systems

EE 490 Robotics

**Math Elective (take at least 3 hours)**

MATH 307 Linear Algebra

MATH 350 Advanced Engineering Math

**MATH 370 Applied Techniques in Math**

Science Electives (take at least 3 hours)

CHEM 116 Intro to College Chemistry

CHEM 120 College Chemistry I

BIOL 120 Biological Concepts

ENV 280 Intro to Environmental Science

GEOL 111 The Earth

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

**Remove ENGR 175, EE 175, UC 175 as a required course**

Currently students are allowed to take a combination of EE Design I and a University Experience. All transfer students have been exempt from University Experience. In order to lower program hours, EE students will not be required to take a University Experience course. Students that begin the program at a lower math level will continue to be advised to take UC 175 or ENGR 175.

**Modify the numbers of credit-hours to reflect changes in EE 180, EE 200, EE 341, and EE 460**

The numbers of credit-hours for these courses has been changed recently, and these changes now appear in the program.

**Change EE 405, EE 450, EE 451, EE 470, EE 475, and EE 479 from required courses to electives.**

The Electrical Engineering Program reviewed the curriculum of several other electrical programs. The course work in EE 405 (EE Research Seminar) , EE 450/451 (Digital Signal Processing), EE 470/475 (Communications), EE 479 (Fundamentals of Optoelectronics) are all common electives in engineering programs. Moving these courses into the list of electives will increase the students’ ability to select courses of interest to them.

**Change the number of required EE Elective credit-hours from 6 to 12**

Because several required engineering courses will become electives, students will be required to take at least 12 credit-hours of electives. This new arrangement will allow courses to be taught in alternate years, increase students' options and lower the total number of hours required in the program.

**Add MATH 370 to list of math electives**

For several semesters the Math Department has taught MATH 370 (Applied Techniques in Mathematics). MATH 370 covers applications that include linear algebra. The EE faculty believe that electrical engineering students will benefit from the flexibility of taking MATH 307 or MATH 370. MATH 350 is currently not being offered but was a wonderful course that is still on the books.

**Add ENGR 400 to the listed of accepted Engineering /Science Electives**

EE Faculty believe that students will benefit from having ENGR 400 Systems Engineering on the list of acceptable Engineering /Science Electives.

**Decrease the number of credit-hours in program from 62 to 57**

The changes outlined above will reduce the program requirements by 5 hours. WKU is encouraging academic units to decrease the number of credit-hours in their major programs.

**5. Proposed term for implementation and special provisions:** Fall 2014

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

Department of Engineering 31 Oct 2013

Ogden College Curriculum Committee 11/07/13

Undergraduate Curriculum Committee

University Senate

**Attachment: Program Inventory Form**