**Ogden College of Science and Engineering**

**Office of the Dean**

**745-4449**

**REPORT TO THE UNIVERSITY CURRICULUM COMMITTEE**

Date: September 11, 2015

The Ogden College of Science and Engineering submits the following action items for consideration at the September 2015 UCC meeting:

1. New Business

|  |  |
| --- | --- |
| **Type of item** | **Description of Item & Contact Information** |
| Action | **Proposal to Revise a Program**  Ref. 555, Computer Information Technology, 36 hrs.  Contact: Mark Revels, [mark.revels@wku.edu](mailto:mark.revels@wku.edu), x4207 |
| Action | **Proposal to Create a New Course**  EE 436, Electric Machines and Drives, 3 hrs.  Contact: Farhad Ashrafzadeh, [farhad.ashrafzadeh@wku.edu](mailto:farhad.ashrafzadeh@wku.edu), x5877 |
| Action | **Proposal to Revise a Program**  Ref. 476, Systems Engineering, 21-21.5 hrs.  Contact: Robert Choate, [Robert.choate@wku.edu](mailto:Robert.choate@wku.edu), x8852 |

Proposal Date: 04/20/2015

**Ogden College of Science & Engineering**

**Architectural & Manufacturing Sciences**

**Proposal to Revise a Program**

**(Action Item)**

Contact Person: Mark A. Revels, Ph.D., mark.revels@wku.edu, 270-303-3019

**1. Identification of program:**

* 1. Current program reference number: 555
  2. Current program title: Computer Information Technology
  3. Credit hours: 36

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

* Change catalog description
* Add selective courses: AMS 342, 367, 390, 394, 396, 430, 475
* Add required capstone course: AMS 490

**3. Detailed program description:**

|  |  |
| --- | --- |
| The CIT degree requires 120 credit hours and leads to a Bachelor of Science degree. No minor or second major is required. Enrollment in the CIT program is limited and based on student qualifications. All CIT courses must be completed with a grade of “C” or better. All students must take the following courses: CIT 300, 302, 352, and 372. In addition, students must take CIT 310, 312, 330, 332, 350, and 370; transfer students will transfer 18 hours of credit to fulfill these course requirements. Students must take 30 hours of electives from the following list: CIT 412, 414, 416, 418, 432, 434, 436, 438, 452, 454, 456, 458, 472, 474, 476, 478, 482, 484, 486, 492, 494, and 496; 2+2 students will transfer 6 hours to apply toward the elective requirement. Electives should be selected consistent with WKU’s degree  requirements including:  • 36 hours minimum in courses earned at WKU  • 42 hours in upper-division credit [Students who transfer to WKU with an applied associate degree in a technology area (e.g., Associate of Applied Science) receive a 6-hour waiver from the overall upper-level course requirement.]  • 120 hours minimum overall  • Colonnade Program Requirements  • MATH 116 or equivalent    CIT majors transferring with an associate’s degree in information technology from one of WKU’s partner schools should meet with their advisor to determine the 24 hours of transferred credit used in the major. A list of partner schools is available on the site. | **Computer information technology (CIT) is an integral part of modern life and business. And, careers in the CIT field frequently exceed median pay and future job outlook growth. The CIT program at WKU can help prepare students for many rewarding careers, including:**   * **Computer Network Architect** * **Computer Programmer** * **Computer Support Specialist** * **Computer Systems Analyst** * **Database Administrator** * **Information Security Analyst** * **Network and Computer Systems Administrator** * **Software Developer** * **Web Developer**   **Program Description**  The CIT **online** degreerequires 120 credit hours and leads to a Bachelor of Science degree. No minor or second major is required. Enrollment in the CIT program is limited and based on student qualifications. All CIT courses must be completed with a grade of "C" or better. **The program requires 36 to 60 hours of upper-division CIT coursework, depending on transfer credits.** ~~All students must take the following courses: CIT 300, 302, 352, and 372. In addition, students must take CIT 310, 312, 330, 332, 350, and 370; transfer students will transfer 18 hours of credit to fulfill these course requirements. Students must take 30 hours of electives from the following list: CIT 412, 414, 416, 418, 432, 434, 436, 438, 452, 454, 456, 458, 472, 474, 476, 478, 482, 484, 486, 492, 494, and 496; 2+2 students will transfer 6 hours to apply toward the elective requirement.~~ ~~Electives~~ **All courses** should be selected consistent with WKU's degree requirements including:   * 36 hours minimum ~~in courses~~ **must be** earned at WKU **(typically satisfied by CIT course requirements below)** * 42 hours **must be** in upper-division courses ~~[Students who transfer to WKU with an applied associate degree in a technology area (e.g., Associate of Applied Science) receive a 6-hour waiver from the overall upper-level course requirement.]~~ **(36 hours for students that transfer with an Associate of Applied Science degree in a computer technology or related major**, **also satisfied by CIT course requirements below)** * 120 hours minimum overall * Colonnade program requirements * MATH 116 or **higher**   ~~CIT majors transferring with an associate’s degree in information technology from one of WKU’s partner schools should meet with their advisor to determine the 24 hours of transferred credit used in the major. A list of partner schools is available on the site.~~  **Degree Requirements For transfer students (with an Associate of Applied Science degree or equivalent in computer technology or related major), 36 hours of CIT coursework is required. These include:**   * **Four 300-level core courses: CIT 300, 302, 352, 372 (12 hours)** * **Seven courses, to be selected from 400-level CIT courses and/or from AMS 342, 367, 390, 394, 396, 430, 475 (21 hours)** * **Capstone course: AMS 490 (3 hours, to be taken in last semester)**   **For non-transfer students, 60 hours of CIT coursework is required. These include:**   * **Ten 300-level foundation courses: CIT 300, 302, 310, 312, 330, 332, 350, 352, 370, 372 (30 hours)** * **Nine courses, to be selected from 400-level CIT courses and/or from AMS 342, 367, 390, 394, 396, 430, 475 (27 hours)** * **Capstone course: AMS 490 (3 hours, to be taken in last semester)**   **Please visit the program website for more information:** [**www.wku.edu/cit**](http://www.wku.edu/cit) |

**(Side-by-side table is required for most program changes showing revised program on the right and identifying deletions by strike-through and additions in boldface.)**

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

* Change catalog description: The CIT program recently moved from University College to the AMS department (Ogden). The new catalog description is more consistent with AMS program catalog descriptions while also reflecting the AMS selective course additions.
* Add AMS selective courses: The AMS selective courses are being added due to student demand and in an attempt to provide technology-management related course options to CIT majors. As these courses are already provided by the department, this adds flexibility and value to the program with little or no additional cost.
* The program has an entry course, but no capstone in which to assess overall student learning. This change adds a required capstone course.

**5. Proposed term for implementation and special provisions (if applicable):** Spring, 2016

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

|  |  |
| --- | --- |
| Architectural & Manufacturing Sciences Department | 4/17/2015 |
| Ogden College Curriculum Committee | **05/07/2015** |
| Undergraduate Curriculum Committee |  |
| University Senate |  |

Proposal Date: March 20, 2015

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Create a New Course**

**(Action Item)**

Contact Person: Dr. Farhad Ashrafzadeh, Email: [Farhad.Ashrafzadeh@wku.edu](mailto:Farhad.Ashrafzadeh@wku.edu) , phone: 270-745-5877

**1.** **Identification of proposed course:**

* 1. Course prefix (subject area) and number: EE 436
  2. Course title: Electric Machines and Drives
  3. Abbreviated course title: Electric Machines and Drives
  4. Credit hours: 3 Variable credit (yes or no): no
  5. Grade type: L (lecture)
  6. Prerequisites : EE 473 and EE 345
  7. Course description:

Introduction to principles and contemporary applications of electric machines and drive systems as they pertain to electric vehicles, wind turbines, residential appliances, etc. Topics include the principles of electromechanical energy conversion, switch mode power converters, DC and AC machines, designing feedback controller for motor drives, and speed or torque control of both DC and AC motor drives.

**2. Rationale:**

* 1. Reason for developing the proposed course:

Electric machines account for 60% of total energy consumption at the national level and electric drives are widely used in renewable energy and electric vehicles. Knowledge of these topics is critical to workforce development, as these types of expertise are in high demand in the energy/renewable energy market. When the course was offered on a one-time basis in Spring 2014, twelve students registered and were successful. Therefore, we propose its implementation as an elective on an ongoing and sustainable basis.

* 1. Projected enrollment in the proposed course:

We estimate that around 10 to 15 students will enroll in this course each offering.

* 1. Relationship of the proposed course to courses now offered by the department:

This course will complement the required EE 431 “Introduction to Power Systems.”

* 1. Relationship of the proposed course to courses offered in other departments:

No similar course is being offered in other academic units.

* 1. Relationship of the proposed course to courses offered in other institutions:

A similar course is offered in many engineering programs including:

ECE 500: Electric Machines and Drives, University of Louisville, KY

EE 341: Electric Drives and Machines, University of Texas at Austin, TX

ECE 453: Electric Motor Drives, North Carolina State University, NC

EECS 419: Electric Machinery and Drives. University of Michigan, MI

ECE 495/595: Electric Machinery and Drives, Miami University, FL.

**3. Discussion of proposed course:**

* 1. Schedule type: Lecture
  2. Learning Outcomes: Upon completion of the course, students will:
* Be able to describe the structure of Electric Drive systems and their role in various applications such as flexible production systems, energy conservation, renewable energy, transportation, etc.
* Understand and characterize basic requirements of the mechanical load on electric drives.
* Understand the principles of power electronics in drives using switch-mode converters and pulse width modulation to synthesize the voltages in DC and AC motor drives.
* Understand the two basic principles (generation of force and emf) that govern electromechanical energy conversion.
* Be able to design speed and position controller of motor drives.
* Be able to model AC machines using space vectors.
* Be able to explain and utilize the basic principles of permanent magnet AC drives.
* Be able to explain and utilize the operation of induction machines in steady state.
  1. Content outline:
* Introduction to electrical motor drives
* Mechanical system requirement of electrical drives
* Switched mode power converters for motor drives
* Basics of magnetic circuits
* Principles of electromechanical energy conversion
* DC motor drives
* Designing feedback controllers for motor drives
* Introduction to AC machines and space vectors
* Sinusoidal permanent magnet AC (PMAC) motor drives
* Speed control of AC induction motor drives
  1. Student expectations and requirements:

Student learning will be evaluated using homework, quizzes, simulation, papers, and exams.

* 1. Tentative texts and course materials:

“Electric Machines and Drives: A First Course,” By: Ned Mohan

“Electrical Machines, Drives, and Power Systems” By: Theodore Wildi

**4. Resources:**

* 1. Library resources:

No additional library resources are needed to deliver this course.

* 1. Computer resources:

No computer resources beyond what is currently available in the Department of Engineering will be required.

**5. Budget implications:**

* 1. Proposed method of staffing:

Faculty of the department with credentials in the appropriate discipline will teach this course.

* 1. Special equipment needed:

The Department of Engineering has a sufficient inventory of equipment to deliver this course.

* 1. Expendable materials needed:

No expendable materials needed.

* 1. Laboratory materials needed:

Existing laboratory supplies are sufficient to support the needs of this course.

**6. Proposed term for implementation:** Spring 2016

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

|  |  |
| --- | --- |
| Engineering Department | April 2, 2015 |
| Ogden College Curriculum Committee | **05/07/2015** |
| Undergraduate Curriculum Committee |  |
| University Senate |  |

Proposal Date: August 24, 2015

**Ogden College of Science and Engineering**

**Department of Engineering**

**Proposal to Revise a Systems Engineering Minor Program**

**(Action Item)**

Contact Person: Robert Choate, [robert.choate@wku.edu](mailto:robert.choate@wku.edu), 5-8852

**1. Identification of program:**

* 1. Current program reference number:476
  2. Current program title: Systems Engineering
  3. Credit hours: 21 (CE Majors), 21.5 (EE Majors) or 21 (ME Majors)

**2. Identification of the proposed program changes:** Addition of a course option to requirements

**3. Detailed program description:**

Table 1: Systems Engineering Minor Required Courses

|  |  |  |  |
| --- | --- | --- | --- |
| **Current Required Courses** | | **Proposed Required Courses** | |
| **Course** | **Credit Hours** | **Course** | **Credit Hours** |
| EE 210 or  EM 221or EM 222 | 3.5 (EE)  or 3 (CE or ME) | EE 210 or  EM 221or EM 222 | 3.5 (EE)  or 3 (CE or ME) |
| STAT 301 | 3 | STAT 301 or **CE 305** | 3 |
| ENGR 400 | 3 | ENGR 400 | 3 |
| CE 498 or EE 401 or ME 412 | 3 | CE 498 or EE 401 or ME 412 | 3 |
| **TOTAL** | **12.5 (EE)**  **or 12 (CE/ME)** | **TOTAL** | **12.5 (EE)**  **or 12 (CE/ME)** |

\* A panel review of the student senior project proposal is required. The proposal must incorporate systems engineering principles outlined in ENGR 400.

Table 2 below contains the elective courses and is not changing.

Table 2: Systems Engineering Minor Elective Courses **(Minimum Required: 9 Credit Hours)**

|  |  |  |
| --- | --- | --- |
| **Course** | **Description** | **Credit Hours** |
| CE 303/304 | Construction Management/Lab | 3/1 |
| CE 4xx\*\* | CE Technical Electives | 6 |
| EE 460 | Continuous Control Systems | 4 |
| EE 4xx\*\* | EE Technical Electives | 6 |
| EM 313 | Dynamics | 3 |
| ME 49x\*\* | ME Technical Electives | 6 |

\*\* The technical elective must incorporate or expand on systems engineering principles as outlined in ENGR 400 Principles of Systems Engineering. Technical elective courses currently meeting this intent include but are not limited to: CE300 Floodplain Management, CE326 Engineering Law, CE360 Estimating Scheduling Bidding, CE361 Estimating Lab, CE366 Mechanical and Electrical Systems, CE378 Route Surveying, CE379 Route Surveying Lab, CE380 Boundary Surveying, CE381 Boundary Surveying Lab, CE383 Structural Steel Design, CE384 Reinforced Concrete Design, CE426 Advanced Structural Materials, CE436 Design/ Construction Integration, CE440 Masonry Design and Construction, CE441, Masonry Construction Lab, CE451 Water and Wastewater Treatment, CE462 Hydraulic Engineering Systems, CE466 Contracts and Specifications, CE476 Highway Construction, CE486 Steel and Concrete Construction, EE410/411 Computer Design, EE443 Microfabrication and MEMS, EE 431 Introduction to Power Systems, EE432 Power Systems II, EE461 Discrete Control Systems, EE443 Communication Applications, ME49X Reliability Engineering, ME49X Advanced Strength of Materials, ME 49X, Energy Conversion and Sustainability, ME49X Failure Analysis and Prevention, ME 49X Finite Element Analysis and ME49X Kinematics and Dynamics.

**4. Rationale for the proposed program change:** The minor was intended to be a multidisciplinary program for all majors in the Department of Engineering. Many civil engineering students do not take STAT 301 but take CE 305 Risk Analysis instead. Risk analysis is a topic typically found in systems engineering programs.

**5. Proposed term for implementation and special provisions (if applicable):** Spring 2016

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

|  |  |
| --- | --- |
| Department of Engineering | August 27, 2015 |
| OSCE Curriculum Committee | **09/03/2015** |
| Undergraduate Curriculum Committee |  |
| University Senate |  |