REGULAR COURSE SYLLABUS

School of: School of Professional Studies

Department: Engineering Technology

Prefix & Course Number: EET 3730  Crosslisted With*: ___

Course Title: Process Control Systems

Banner course title (30 characters): Process Control Systems

Check All That Apply: Required for Major: X  Required for Minor:  Specified Elective: ___

Required for Concentration:  Elective:  Service Course: ___

To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliance with this definition.

**Federal Credit Hour Definition:** A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:

(1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or

(2) at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practica, studio work, and other academic work leading toward the award of credit hours. 34CFR 600.2 (11/1/2010)

Credit Hours: 2 (1.5+1)

Face-to-Face or Equivalent Hours per course:

Lecture 22.5  Lab15  Internship  Practicum  Other (please specify type and hours):

Additional Student Work Hours per course: 60

Schedule Type: B  Grade Mode: ___

Variable topics umbrella course: No X Yes  If Yes, number of credit hours allowed ___

Specified repeatable course: No X  Yes ___

APPROVED:

Department Chair OR Program Director  Date 1/30/14

Dean OR Associate Dean  Date 03/13/14

Associate VP, Academic and Student Affairs  Date

*If crosslisted, attach completed Course Crosslisting Agreement Form
Prefix and Course Number: EET 3730

**Prerequisite(s):** EET 1150 or EET 2000, with a grade of “C” or better

**Corequisite(s):**

**Prerequisite(s) or Corequisite(s):**

**Banner Enforced:**
- **Prerequisite(s):** EET 1150 or EET 2000, with a grade of “C” or better
- **Corequisite(s):**
- **Prerequisite(s) or Corequisite(s):**

**Registration restrictions: Level _____ Class _____ Program/Major _____ Student attribute _____**

**Catalog Course Description:**
This course is an introduction to the applications of Proportional, Integral, & Derivative (PID) controllers in the process control industry. Topics include: structure of feedback, sensors, controllers, control valves, process dynamics, timing, piping and instrument drawing.

**Specific Variable Topics Course Description (if applicable, umbrella course description included above):**
N/A

**Required Reading and Other Materials will be equivalent to:**

**Specific, Measurable Student Behavioral Learning Objectives:**
Upon completion of this course the student should be able to:
2. Select PID controllers for business applications.
3. Design elementary process control systems.

**Detailed Outline of Course Content:**

I. **Introduction**
   - A. Manual Control
   - B. Automatic Control
   - C. Open-Loop
   - D. Closed-Loop

II. **Structure of Feedback**
   - A. Block Diagrams
   - B. Layout

III. **Sensors**
   - A. Measurement Basics
     1. Sensor Dynamics
     2. Sensor Selection
     3. Accuracy and Precision
     4. Rangeability & Turndown
     5. Uncertainty
     6. Transmission Systems
        a. Electrical
        b. Pneumatic
   - B. Smati Sensors
Prefix and Course Number: EET 3730

C. Types
   1. Pressure
   2. Flow
   3. Level
   4. Temperatures
   5. Analytical

IV. Controllers
   A. On-Off Control
   B. Proportional, Integral, & Derivative (PID) Control
   C. PID Control

V. Control Valves
   A. Basic Operation
   B. Selection & Sizing
   C. Performance
   D. Fail Safe Operation

VI. Process Dynamics
   A. First Order
   B. High Order
   C. Dead Time
      1. Transmiation Log
      2. Higher Order Approximation
   D. Closed-Loop vs. Open-Loop

VII. Tuning
   A. Performance Indexes
   B. Methods

VIII. Piping & Instrument Drawings

IX. Advanced Methods
   A. Ratio
   B. Cascade
   C. Feed Forward
   D. Multivariable (brief)

X. Process Management

Evaluation of Student Performance:
1. Written Exams
2. Homework
3. Lab Reports
4. Presentations