

COURSE SYLLABUS
Southeast Missouri State University

Department of Industrial & Engineering Technology

Course No: ET – 468/568

Title of Course: Industrial Controls

Revision: Spring 2000

- I. Catalog Description and Credit Hours of Course: A study of process controls fundamentals (Proportional Integral, Proportional Derivate, Proportional, Integral, and Derivate), sensors, transducers, actuators, and distributed controls, and their industrial/commercial applications using programmable controllers. (3 credit hours)
- II. Prerequisite (s): ET 192 & ET 365 Permission of the Instructor
- III. Purpose or Objectives of the course:
 - A. describe the operation of different control systems including proportional, integral, and derivate.
 - B. identify and select input sensors, transducers, and output actuators for a given industrial process.
 - C. understand the properties and perform the calibration of basic measurement channels.
 - D. implement open and closed loop control systems using commercially available equipments.
 - E. implement closed-loop and open-loop control systems, including proportional, integral, and derivate.
- IV. Expectations of Students:
 - A. Have a background of mathematics, and basic programmable logical control programming.
 - B. Attend class regularly, according to the policies presented in the current University Bulletin and be responsible for all information presented in class.
 - C. Participate in class discussion.
 - D. Prepare assignments for timely submission, as specified by the instructor.
 - E. Make satisfactory scores on quizzes and examinations. (No make-up exams unless student absence is justifiable).

- F. **For graduate credit, students must complete a design project. A project proposal must be submitted for approval before the end of the eighth week.**

- V. Course Content or Outline (Weeks):
 - A. Transistor as a decision maker (1)
 - B. Transistor Switches (2)
 - C. Silicon Controlled Rectifiers (3)
 - D. TRIACs and Other Thyristors (4)
 - E. **TEST 1**
 - F. Open-loop process control (5-10)
 - G. Positive and negative feedback in closed loop process control Chapter 9 /Class notes
 - H. Basic measurement channel
 - I. Basic measurement channel instrument characteristics
 - J. Process characteristics
 - K. Two-position controller
 - L. Proportional controller
 - M. Proportional plus integral controller
 - N. Proportional plus derivative controller
 - O. Proportional plus integral plus derivative controller
 - P. **TEST 2**
 - Q. Alarms in process control systems (11)
 - R. Troubleshooting (12)
 - S. Input transducers (13)
 - T. Correcting devices (14)
 - U. Examples of Industrial closed loop control systems (15)

- V. **FINAL EXAM** (16)
- VI. Textbook (s) and/or Other Required Materials or Equipment:
- A. Maloney, T. J. Modern Industrial Electronics. (1996), Prentice Hall
 - B. Two HD diskettes
 - C. Access to word processor: All lab reports must be typed.
- VII. Basis for Student Evaluation: Students will be evaluated based upon the following:
- A. Exam 1 (20%)
 - B. Exam 2 (20%)
 - C. Labs (35%)
 - D. Final Exam (20%)
 - E. Quizzes/Participation/Assignments (5%)
 - F. Grading Scale:
 - 1. 90 – 100% = A
 - 2. 80 – 89% = B
 - 3. 70 – 79% = C
 - 4. Below 70% = F
- VIII. Disabilities Statement: If you have special needs addressed by the American with Disabilities Act and need course materials in alternative format, notify your course instructor immediately. Reasonable efforts will be made to accommodate your special needs.