

Sample course syllabus for ABET Self-Study Report (new format)

1. *Course number and name*

ENGR 411: Instrumentation and Process Control laboratory

2. *Credits and contact hours*

1 credit hour; one 2 hr 30 min laboratory session/week.

3. *Instructor's or course coordinator's name*

Instructor: Ben Rasenow, Instructor

Course coordinator: V.V.Krishnan, Professor of Mechanical Engineering

4. *Text book, title, author, and year*

N. A. Anderson, Instrumentation for Process Measurement and Control, Third Edition, CRC Press, 1998

a. *other supplemental materials*

1. Considine, D.M., Process Instruments and Controls Handbook, McGraw Hill, 1984
2. Bateson, R.N., Introduction to Control System Technology, Prentice-Hall, 1996
3. Additional reading material on ISA standards and codes will be provided during laboratory briefing sessions

5. *Specific course information*

a. *brief description of the content of the course (catalog description)*

Instrumentation for measurement of flow, temperature, level and pressure. Experiments on level, flow, and temperature control. P, PI, PID, and programmable logic controllers.

b. *prerequisites or co-requisites*

ENGR 410: Process Instrumentation and Control (maybe taken concurrently)

c. *indicate whether a required, elective, or selected elective course in the program*

Required/Elective for Mechanical Engineering; Elective for Electrical Engineering.

6. *Specific goals for the course*

a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

- Students will acquire the ability to design basic process control configurations using standard algorithms and process instrumentation typically used in industry
- Students will acquire hands-on experience with basic industrial instrumentation.
- Students will acquire a working knowledge of the basic control strategies used in the control of industrial processes
- Students will be able to develop P&ID and spec sheets for simple control systems.
- Students will be able to trace control loops in industrial systems

b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): a, b, c, e, g, i, j, k.

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7. *Brief list of topics to be covered*

- Calibration of sensors
- Calibration of final control elements
- Loop tracing and ISA standards
- Commissioning a flow control loop with a digital controller
- Level control using "P" and "PI" controllers
- Temperature control loop with Cascade and ratio controls
- Dynamics of Control loop-tuning