CURRICULUM PROPOSAL FORM

*DEADLINES:

PROPOSAL TITLE: INSTRUMENTATION

SPONSOR/S: J. SCHMIDT & CEE 462. CERN

DEPARTMENT: ENGINEERING

CHECK ALL THAT APPLY:

UNDERGRADUATE GRADUATE

COLLEGE: ENGINEERING

If LAS: History/Humanities
Math/Sciences
Social/Behavioral Sciences

TYPE OF PROPOSAL (Check ALL that Apply)

General Education
New Course in Bank
Existing course, Add To Bank
Multicultural/Global Designation
Writing Intensive Designation

New Minor/Concentration/Specialization
New Major/Degree Program
Short Term Course Proposal

New Course (NOT Gen. Ed.)
Name Change (Dept., School, Major)
Changes in Degree Requirements
Changes Involve Gen. Ed. requirements
Minor Changes to Existing Courses
Course is NOT General Education
Course IS General Education

DEPARTMENT (SIGNATURE INDICATES APPROVAL)

Reinhold R. Heskett 03/01/99

DEPT. CURRICULUM CHAIR / DATE

DEPT. CHAIRPERSON / DATE

COLLEGE CURRICULUM COMMITTEE

DATE OF OPEN HEARING (if necessary) 4/30/99

APPROVED

NOT APPROVED
Comments:

Robert P. Heskett 4/20/99

SIGNATURE DATE

ACADEMIC DEAN (& GRADUATE DEAN, for New Graduate Programs Only)

APPROVED

NOT APPROVED
Comments:

SIGNATURE (Academic Dean) DATE

SIGNATURE (Graduate Dean) DATE
Course Proposal

1. Details:

a) Course Title: Instrumentation (0909.471)
b) Sponsor: Dr. John L. Schmalzel, Electrical and Computer Engineering (ECE) and ECE Curriculum Committee
c) Credit Hours: 3 credit hours
d) Course Level: Undergraduate
e) Curricular Effect: Elective course for UG students
f) Prerequisites: Electronics I (0909.311), Network I (0909.201) or consent of instructor.
g) Suggested Time/Scale of Implementation: Fall 1999
h) Resources: One section

No additional faculty are needed to meet this requirement. Laboratory equipment will be obtained consistent with College of Engineering multi-year budget. Library acquisitions will be required.

2. Rationale:

The proposed course is a revision to part of the Engineering Curriculum Proposal approved by the College Senate in December, 1994. The proposed course is consistent with the establishment of the School of Engineering approved by the Board of Trustees in February, 1995.

Instrumentation is an underlying component of many engineering, scientific, and technical fields. Successful measurements require that the correct instrumental techniques be applied to a source and that signals are properly conditioned and processed to obtain data that contains information. Instrumentation deals with the sum of the elements involved in the measurement process.

3. Essence of the Course:

a) Objectives:

The proposed course has a number of objectives:

(i) Provide an overview of instrumentation systems architecture.
(ii) Provide a working knowledge of fundamental instrumentation terms and concepts; e.g., first- and second-order instruments, basic instrumentation elements.

(iii) Survey transducers, signal conditioning circuitry, and digital signal processing operations.

(iv) Treat elements of modern instrumentation systems; e.g., standards such as IEEE-488, and Standard Commands for Programmable Instrumentation (SCPI).

(v) Apply the elements of instrumentation systems analysis and design to the solution of a selected measurement problem.

b) Topical Outline:

- Instrumentation architecture. Measurands, stimulus, response, environmental factors, signal conditioning, display, storage, communication, power supplies, etc.


- Transducers. Passive and active transducers. Transducers for force, pressure, temperature, humidity, power, etc. Smart sensor technologies.

- Instrumentation standards. Automatic test equipment (ATE) bus-oriented protocols (IEEE-488). Interface command languages (SCPI). Data acquisition and control environments (HP VEE, etc.)

- Applications: Solution of a selected instrumentation problem.

c) Evaluation and Grading Procedures:

Student grades will be based on projects, examinations, homework, and written and oral technical communication. For students enrolled for graduate credit, additional work will be required; e.g., expanded scope and complexity of instrumentation development problem.

d) Course Evaluation:

The proposed course will be evaluated based on student evaluations and critical review by engineering faculty.

e) Texts:
The course will also be complemented with supplemental notes and materials.

4. Results of Consultations: None

a) Consulted Departments: Mechanical Engineering

b) Consultants and Consultant Statements:

c) Written Consultations:

5. Additional Supporting Information:
6. Catalog Description:

TITLE: Instrumentation

Elements of instrumentation systems are treated including transducers, signal conditioning, and signal processing. Elements of modern instrumentation systems including standards (IEEE-488, SCPI) and smart sensors are considered. Course is complemented with an instrumentation application.

Prerequisites: Electronics I (0909.311), Network I (0909.201), or consent of instructor.