

Electrical Eng

C

PROPOSAL NUMBER: 99- 468

CURRICULUM PROPOSAL FORM

*DEADLINES:

REGULAR COURSE PROPOSALS: OCTOBER 23, 1998 FOR FALL, 1999 AND FEBRUARY 19, 1999 FOR SPRING, 2000
SHORT-TERM COURSE PROPOSALS: DECEMBER 11, 1998 FOR FALL, 1999 AND MARCH 26, 1998 FOR SPRING 2000

PROPOSAL TITLE: INSTRUMENTATION
SPONSOR/S: J. SCHUMLEITZ & ECE CURR. COMM
DEPARTMENT: ENGINEERING C909.471

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 (NOT Gen. Ed.)
 New Course in Bank Name Change (Dept., School, Major)
 Existing course, Add To Bank Changes in Degree Requirements
 Multicultural/Global Designation Changes Involve Gen. Ed. requirements
 Writing Intensive Designation Minor Changes to Existing Courses
 New Minor/Concentration/Specialization Course is NOT General Education
 New Major/Degree Program Course IS General Education
 Short Term Course Proposal

DEPARTMENT (SIGNATURE INDICATES APPROVAL)
Ravi Patel Ramesh Ven 03/09/99 DEPT. CURRICULUM CHAIR / DATE
John Siff 06/24/99 DEPT. CHAIRPERSON / DATE

COLLEGE CURRICULUM COMMITTEE
DATE OF OPEN HEARING (if necessary) 4/20/99
 APPROVED
 NOT APPROVED
Comments:
Robert P. Hebert 4/20/99
SIGNATURE DATE

ACADEMIC DEAN (& GRADUATE DEAN, for New Graduate Programs Only)
 APPROVED
 NOT APPROVED
Comments:
James [Signature] 3/9/99
SIGNATURE (Academic Dean) DATE
SIGNATURE (Graduate Dean) DATE

UNIVERSITY CURRICULUM COMMITTEE

DATE OF OPEN HEARING (if necessary) 4/26/99 (college level)
 APPROVED

NOT APPROVED

Comments:

Minutes Rec'd 5/7/99

SIGNATURE DATE

SENATE

Date announced at Senate 4/30/99

Voted upon at Senate: _____ Approved _____ Not Approved _____ Date: _____

EXECUTIVE VICE PRESIDENT/PROVOST

APPROVED

4/26/99

NOT APPROVED If no, reasons are as follows:

STUDENT CREDIT HOURS _____ FACULTY LOAD HOURS _____ EQUALIZED CREDIT HOURS _____

OFFICIAL COPY & APPROVAL SHEET FILED (DATE): _____

DATE/SIGNATURE EXECUTIVE VICE PRESIDENT/PROVOST [Signature] 5/26/99

REGISTRAR

DATE APPROVED COURSE DESCRIPTION RECEIVED _____

HEGIS TAXONOMY & COURSE NUMBER ASSIGNED 0909.471

DATE/SIGNATURE OF REGISTRAR Robert O. Lubat 4/16/99

NOTIFICATION FORWARD:

SENATE CURRICULUM COMMITTEE CHAIRPERSON

DEPARTMENT CHAIRPERSONS

ACADEMIC DEAN(S)

REGISTRAR

SPONSOR(S)

[Signature] 7/1/99

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 One section
h) Resources	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.
- Instrumentation elements. Lumped-parameter modeling of instruments. Errors. Fundamental signal conditioning and signal processing actions. Off-the-shelf instrumentation electronics and subsystems.
- 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:

J.G. Webster, *Applied Biomedical Instrumentation*. McGraw-Hill, 1994.

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.