

Electrical Eng

11

PROPOSAL NUMBER: 99-463

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: INTERACTION DESIGN (Requested: 0909.467)
SPONSOR/S: J. SCHUMLEITZ & ECE CONS. COM.
DEPARTMENT: ENGINEERING 0909.467

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)
Ravi Sankar Ramachandran 03/01/99
DEPT. CURRICULUM CHAIR / DATE
[Signature] 06 Dec 99
DEPT. CHAIRPERSON / DATE

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

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

UNIVERSITY CURRICULUM COMMITTEE

DATE OF OPEN HEARING (if necessary) 4/20/99 (College Board)
 APPROVED

NOT APPROVED

Comments:

Faculty Review 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

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] 5/30/99

REGISTRAR

DATE APPROVED COURSE DESCRIPTION RECEIVED _____

HEGIS TAXONOMY & COURSE NUMBER ASSIGNED 0909.407

DATE/SIGNATURE OF REGISTRAR Robert A. Kubat 7/6/99

NOTIFICATION FORWARD:

SENATE CURRICULUM COMMITTEE CHAIRPERSON

DEPARTMENT CHAIRPERSONS

ACADEMIC DEAN(S)

REGISTRAR

SPONSOR(S)

Course Proposal

1. Details:

a) Course Title:	Interaction Design (0909.407)
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 (UG)
e) Curricular Effect:	Technology Focus Elective course for UG students
f) Prerequisites:	Senior standing, Junior Clinic II (0901.302).
g) Suggested Time/ Scale of Implementation	Fall 1999 and beyond 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. No additional 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.

One of the newest category of design specializations is *interaction* design. Interaction design professionals are likely to be trained as a specialty within Industrial Design programs. However, the nature of the work they do is an important viewpoint on how to add value to product development. The old duality paradigm of product function vs. form was that form followed *technical* function. The new paradigm (as described by a major Japanese consumer electronics company) is that form follows *emotional* function. Product form must reflect and address the emotional needs of the consumer. The way the consumer interacts with products is strongly influenced by their emotional state. They map their needs onto the product interface, which must in turn deliver those needs.

Modern technology is a global commodity. No single company or country has a corner on technology to the extent that they have a unique technological advantage. The impact of this situation is that competition for consumers has moved beyond functional comparisons and simple forms to the realm of emotional forms. This places a premium on design groups having the ability to address the interaction between customers and products.

Looking back several decades, the roots of interaction design can be seen as loosely derived from *cybernetics*. Other components are present in multimedia design or graphics design. Interaction design is more than graphic display design for computer-human interfaces. It is the complex collection of ergonomics, interface controls, feedback (tactile, audio, visual), texture, shape, and color that combine to form the interaction image for the consumer.

3. Essence of the Course:

a) Objectives:

The proposed course has a number of objectives:

- (i) Review the product design process. Identify the interface elements implied by example products and systems. Describe metrics for qualitative and quantitative assessment of interface characterization.
- (ii) Explore the variety of input/output interface techniques that can be used to support the interaction between human and product.
- (iii) Provide opportunities to apply didactic principles to development of interaction designs for representative applications.

b) Topical Outline:

The content of the course will reflect current practice using examples drawn from current best practices.

- Provide an overview of the product design process. Identify the stages at which interaction design is considered (corporate image, product definition, customer attributes, conceptual design, design selection, virtual/physical prototyping, testing, etc.).
- Review fundamental aspects of the human-machine interface. Physiological basis for sensory and effector interaction: musculo-skeletal system, nervous system, vision system, auditory system, olfactory system. Tactile discriminant ability, visual acuity and color response, psychoacoustics.
- Identify primary input interaction modalities and methods of transduction and interface. For example, force-operated controls (switches, knobs, sliders, buttons) composed of spring contact systems, resistive or piezoresistive elements, optical or magnetic elements, etc.
- Identify output interaction modalities and methods of transduction and interface. Examples include visual display systems such as cathode ray tubes (CRT), liquid crystal displays (LCD), light emitting diode (LED), incandescent or fluorescent lamps, vacuum fluorescent displays (VFD), and novel micro optoelectromechanical systems (MOEMS).

- Examine ergonomic issues of user-product interaction. Range of motion of fingers, dexterity. Population statistics for 95th percentile male and female user. Design for the remaining 5% and for the disabled.
- Incorporate the user in the loop. Designing interaction systems. Simulation tools that support interaction modeling, virtual reality, virtual instrumentation, and rapid prototyping.
- Application of interaction design concepts to example product development projects.

c) Evaluation and Grading Procedures:

Student grades will be based on projects, examinations, homework, and written and oral technical communication. Graduate students enrolled in the course will perform additional assignments (e.g., perform research into additional aspects of interaction design methodologies) and will be expected to accomplish significantly more complex product interfaces.

d) Course Evaluation:

The proposed course will be evaluated based on student evaluations and critical review by engineering faculty in conjunction with outside consultants/participants.

e) Texts:

This course will be supported through a variety of readings and lecture notes. When possible, outside speakers will be invited to give guest presentations.

R. Kristof, A. Satran, *Interactivity by Design: Creating and Communicating with New Media*. Hayden Books, ISBN 1568302215, 1995.

H. Beyer, *Contextual Design: A Customer-Centered Approach to Systems Design*. Morgan Kaufman, ISBN 1558604111, 1997.

R. Stuart, *The Design of Virtual Environments*. McGraw-Hill, ISBN 0070632995, 1996.

B. Shneiderman, *Designing the User Interface: Strategies for Effective Human-Computer Interaction*. Addison-Wesley, ISBN 0201572869, 1992.

4. Results of Consultations:

a) Consulted Departments: Mechanical Engineering, Computer Science, Psychology.

b) Consultants and Consultant Statements:

c) Written Consultations:

5. Additional Supporting Information:

6. Catalog Description:

TITLE: Interaction Design

Heggs # (0909.407)

This course examines interaction design from several perspectives. The role of ergonomics is treated along with techniques of input and output interfacing. Methods and tools for virtual implementation are presented. The course is complemented with practical applications.

Prerequisite: Senior standing, Junior Clinic II (0901.302).