

Electrical Eng

(11)

PROPOSAL NUMBER: 99- 461

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: Wireless Communications
SPONSOR/S: R. Kucharek, S. Mandayam, J. Schmalzel
DEPARTMENT: ENGINEERING ECE 0909.432

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 Subh Ramesh Kumar 03/09/99 John S. ... 06/24/99
DEPT. CURRICULUM CHAIR / DATE DEPT. CHAIRPERSON / DATE

COLLEGE CURRICULUM COMMITTEE
DATE OF OPEN HEARING (if necessary) 4/20/99
 APPROVED
 NOT APPROVED
Comments:
Robert P. Hebeith 4/24/99
SIGNATURE DATE

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

UNIVERSITY CURRICULUM COMMITTEE

DATE OF OPEN HEARING (if necessary) 4/20/99 (college time)
--- APPROVED

---- NOT APPROVED

Comments:

Annex 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 C. J. Mott 5/20/99

REGISTRAR

DATE APPROVED COURSE DESCRIPTION RECEIVED _____

HEGIS TAXONOMY & COURSE NUMBER ASSIGNED C909.432

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

NOTIFICATION FORWARD:

SENATE CURRICULUM COMMITTEE CHAIRPERSON

DEPARTMENT CHAIRPERSONS

ACADEMIC DEAN(S)

REGISTRAR

SPONSOR(S)

Course Proposal

1. Details:

- | | |
|---|---|
| a) Course Title: | Wireless Communications (0909.432) |
| b) Sponsor: | Dr. Robert R. Krchnavek, Dr. Shreekanth Mandayam, Dr. John L. Schmalzel and the Electrical and Computer Engineering Curriculum Committee |
| c) Credit Hours: | 3 credit hours |
| d) Course Level: | Senior |
| e) Curricular Effect: | Elective course for electrical and computer engineering majors |
| f) Prerequisites: | Electronics I (0909.311)
Engineering Electromagnetics I (0909.301)
Engineering Electromagnetics II (0909.302)
Electrical Communications Systems (0909.331) |
| g) Suggested Time/
Scale of Implementation | Fall 1999
One section |
| h) Resources | Laboratory equipment will be obtained consistent with the Engineering School 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.

Wireless communications has become quite pervasive throughout our society over a relatively short period of time. Once considered an expensive (but necessary) tool primarily for executives, it has now become a cost-effective tool in everyday life. And the wireless revolution is continuing, with new services being added regularly and prices continuing to drop. This dramatic increase in wireless communication capacity is a result of significant technological developments in digital and RF electronics that continue today. Therefore, we can expect further advances in wireless communications for the foreseeable future.

The increased use of wireless technology in a wide range of systems makes it pertinent that our students be given the opportunity to obtain a working knowledge of wireless communication systems.

3. Essence of the Course:

a) Objectives:

The proposed course has a number of objectives:

- (i) Provide a detailed understanding of the fundamental technologies in wireless communications.
- (ii) Provide an understanding of the critical propagation considerations in wireless communication systems.
- (iii) Provide a system level understanding of the cellular concept of wireless communications.
- (iv) Evaluate various wireless communication systems currently in use and anticipated in the future.

b) Topical Outline:

- Design Fundamentals of Cellular Systems: frequency reuse, channels, handoff, interference, capacity.
- Radio Propagation: reflection, diffraction, and scattering; path loss models; propagation models.
- Wireless Technologies: transmitter and receiver design, modulation techniques.
- Link Analysis: antennas, receiver noise, signal processing techniques.
- System Performance: diversity, equalization, and coding.

c) Evaluation and Grading Procedures:

Student grades will be based on projects, examinations, homework, laboratory reports and written and oral technical communication.

d) Course Evaluation:

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

e) Texts:

Wireless Communications – Principles & Practices, Theodorre S. Rappaport, Prentice Hall PTR.

Wireless and Personal Communications Systems, Vijay K. Garg and Joseph E. Wilkes, Prentice Hall PTR.

4. Results of Consultations:

a) Consulted Departments: Computer Science – In progress.

b) Consultants and Consultant Statements: N/A

c) Written Consultations: N/A

5. Additional Supporting Information: N/A

6. Catalog Description:

Wireless Communications (0909.432)

This course will cover the fundamentals of cellular systems, the technologies that are used to implement such systems, radio propagation effects, modulation techniques and the analysis and systems performance evaluation of wireless links.

Prerequisites: Electronics I (0909.311), Engineering Electromagnetics I & II (0909.301 & 0909.302) and Electrical Communications Systems (0909.331)