S.86-1

SIMON FRASER UNIVERSITY

MEMORANDUM

To: Senate

From: Senate Committee on Undergraduate Studies

Subject: School of Engineering Science - Curriculum Revisions

Date: November 14, 1985

Action undertaken by the Senate Committee on Undergraduate Studies at its meeting of November 12, 1985 gives rise to the following motion:

MOTION:

"That Senate approve and recommend approval to the Board of Governors, as set forth in S.86-1, the proposed curriculum revisions in Engineering Science."

SIMON FRASER UNIVERSITY

MEMORANDUM

SCUS 85-33

To Mr. R. Heath, Registrar & Secretary to the Senate Committee on Undergraduate Studies.	**From** Janet Blanchet, Administrative Assistant, Faculty of Spplied Sciences.
Subject Engineering Science Curriculum Revisions. (ASU. 85-4).	**Date** November 4, 1985.

At a meeting of the Faculty of Applied Sciences held on Tuesday, October 29, 1985 the attached curriculum revisions in Engineering Science were approved.

Would you please place this item on the next agenda of the Senate Committee on Undergraduate Studies.

J. Blanchet

JB

Enclosure.

SIMON FRASER UNIVERSITY

MEMORANDUM

To: Faculty of Applied Sciences Undergraduate Curriculum Committee	From: Dr. D.A. George Director Engineering Science
Subject: Curriculum Changes in Engineering Science.	Date: 24 October 1985

Since the original Engineering Science proposal and with two years experience in offering the program, a number of formal changes have become necessary. While extensive in nature these changes contain little of great substance.

(1) The lower division Engineering Science courses have had their content, sequencing and course numbers changed in the light of experience. The total content of the three courses has not changed except that electrical engineering topics have been dropped in favour of an introduction to discrete time systems.

(2) Separate laboratory courses have been dropped in favour of integrated lecture-laboratory courses as a convenience for faculty, students and administration.

(3) Each option in the original proposal featured a complex selection of highly constrained electives. This has been changed to a list of required courses plus a selection of less tightly constrained electives.

(4) Prerequisite and course changes introduced since the original proposals by other departments have been incorporated.

Donald A. George, Director

DAG:mm
Attachment

24 October 1985

Program Changes
Engineering Science

Program changes are restricted to the course content of each option, except that the Engineering Mathematics option has not been offered and will be dropped from the Calendar. Students will be advised on the selection of electives to follow a mathematics concentration or a robotics concentration within the Electronics Engineering option. The term "Electronics Engineering" is proposed to replace "Electronics and Communications" in the interest of better general understanding of the nature of this option.

Previously, both a course listing and a typical course schedule were used to describe the program options. The latter has proven to be much more widely used so the course listing description has been dropped.

The attached typical course schedules define the program with the proposed changes incorporated. It will be noted that these are arranged so that the first four semesters are common to all options. Specific changes to each option are described below:

(A) <u>All options</u> (where relevant)

(1) ENSC 125-5, 222-5, 280-5 replace ENSC 280-3, 225-3, 322-3, 291-2, 292-2, 293-2. Course proposal forms attached detail these changes.

(2) ENSC 280-3 is no longer identified in the mathematics category and a mathematics elective is added.

(3) ENSC 321-4, 327-4, 382-4 replace ENSC 421-3, 427-3, 382-3 respectively through the incorporation of a laboratory requirement. Lab courses ENSC 291-2 to 494-2 will be changed to 491-1, 492-2, 493-3 and 494-4; Special Laboratory projects courses.

(4) ENSC 101-0 to 109-0 are established in order to provide scheduled time for ENSC 100-6 throughout the program.

(5) CMPT 290-3 replaces 291-4 and CMPT-390-3 is added as a requirement, all as consequences of program changes in Computing Science.

(6) PHYS 324-3 replaces PHYS 425-3 which was used as a placeholder for an electromagnetic course in the program.

(7) CMPT 118 is no longer offered.

(8) ENSC 498-3 and 499-9 replace the project course ENSC 499-11. The additional semester hour credit reflects the new requirement for a formal project proposal.

(9) ENSC 324-3 will not be offered. It is likely another electronics course will be introduced in the future.

(B) Electronics Engineering

(1) MATH 243-3 is dropped as a required course because similar material is covered in CMPT 205-3 and there are a number of other relevant MATH and MACM courses. It is replaced by a mathematics elective.

(2) PHYS 355-3 is dropped as a required course in favour of a science elective (i.e. a basic, applied or mathematical science) in order to provide a broader elective choice for the student.

(3) The structured elective choices involving CMPT 205, 301, ~~393~~, 400, 401, 405, 491 and 492 are replaced by two Computing Science electives drawn from an extensive list of CMPT courses. MACM 401 is moved to be a mathematics elective.

(4) The structured elective choices involving ENSC courses are replaced by three Engineering Science electives chosen from ENSC 425, 426, 428 and 429. Details on changes to these four courses are attached.

(C) Engineering Physics (Electronics)

(1) Elective selection from PHYS 365, 384, 415, 425, 465 and CHEM 465 is replaced by a requirement for PHYS 365, 465, 324.

(2) Elective selection of six of ENSC 324, 382, 421, 425, 426, 426, 429 is replaced by a requirement for ENSC 321, 327 and 382 and election of three of ENSC 425, 426, 428 and 429.

(3) ENSC 495 provides for a basic acquaintance with microelectronics fabrication.

(D) Computer Engineering

(1) As for (1) under Electronics Engineering.

(2) CMPT 301 has been changed so as to be no longer relevant to the program. It is replaced by a Computing Science elective. CMPT 354 is also moved to the elective list. Specific requirements for laboratory courses CMPT 495 and 496 are dropped.

(3) CMPT 404 and 405 are moved to the elective list and CMPT 401 is added as a required course.

(4) Restrictive electives involving CMPT 390, 392, 491, MACM 401 and PHYS 355 are dropped. (Note that the program contains two Computing Science electives and one science elective.)

(5) Restrictive electives involving ENSC 382, 425, 427, 428, 429 is dropped in favour of the choice of two of ENSC 425, 426, 428 with 328, 429 and 382 becoming required.

(E) Biomedical Engineering (Electronics)

(1) Updating of prerequisite requirements has led to moving KIN. 305, 306, 407, 442 from requirements to two or more electives (as allowed by the individual's prerequisite circumstances). BISC 101, 102 become required and CHEM 251, 256 and 261 become available only as electives. KIN. 401, 402 and 480 become available as electives.

(2) ENSC 385 will not be available. ENSC 327 and 321 move from the restrictive elective list to become required. Two electives must be chosen from 425, 426, 428 and 429.

S.F.U.

CORE 'A' ENGINEERING

COURSES AND TYPICAL SCHEDULE — September 11, 1985

SEMESTER ONE

CHEM 104-3	General Chemistry I
CHEM 115-2	General Chemistry Laboratory I
Cmpl I-3	first complementary studies elective
CMPT 101-4	Intro. to High Level Programming Language
MATH 151-3	Calculus I
PHYS 120-3	Physics I

18 semester hours credit

SEMESTER TWO

CHEM 105-3	General Chemistry II
CMPT 105-3	Fundamental Concepts of Computing
ENSC 125-5	Basic Electronics Engineering
MATH 152-3	Calculus II
PHYS 121-3	Physics II
PHYS 131-2	General Physics Laboratory

19 semester hours credit

SEMESTER THREE

Cmpl II-3	second complementary studies elective
CMPT 290-3	Introduction to Digital Circuit Design
ENSC 222-5	Electronic Design I
MATH 232-3	Elementary Linear Algebra
MATH 251-3	Calculus III
PHYS 221-3	Intermediate Electricity and Magnetism

20 semester hours credit

SEMESTER FOUR

CMPT 201-4	Data and Program Organization
CMPT 390-3	Digital Circuits and Systems
ECON 200-3	Principles of Economics I - Microeconomic Principles
ENSC 280-5	Systems Dynamics
Math I-3	first Mathematics elective(1)
MATH 272-3	Introduction to Probability and Statistics I

21 semester hours credit

(1) For Electronics Engineering and Engineering Physics, MATH 252-3 is a required prerequisite and should be taken here.

ELECTRONICS ENGINEERING

COURSES AND TYPICAL SCHEDULE — September 11, 1985

SEMESTER FIVE

Cmpl III-3	third complementary studies elective
Cmpt I-3	first Computing Science elective
CMPT 391-3	Microcomputer Hardware Workshop
ENSC 300-3	Engineering Design and Management
ENSC 321-4	Electronic Design II
Math II-3	second Mathematics elective

19 semester hours credit

SEMESTER SIX

Cmpt II-3	second Computing Science elective
CMPT 393-4	Systems Software for Minicomputers and Microcomputers
ENSC 301-3	Engineering Economics
ENSC 327-4	Communication Systems
PHYS 324-3	Electromagnetics
Scie I-3	first science elective(2)

20 semester hours credit

SEMESTER SEVEN

Cmpl IV-3	fourth complementary studies elective
Ensc I-4	first Engineering Science elective(3)
ENSC 382-4	Control System Design
ENSC 498-3	Industrial Internship II
Scie II-3	second science elective(2)
Scie III-3	third science elective(2)

20 semester hours credit

SEMESTER EIGHT

ENSC 100-6	Engineering Communications(4)
Ensc II-4	second Engineering Science elective(3)
Ensc III-4	third Engineering Science elective(3)
ENSC 499-9	Engineering Science Project

23 semester hours credit

TOTAL 160 semester hours credit

(2) an approved course in a basic, applied or mathematical science

(3) chosen from:

ENSC 425-4	Electronic System Design
ENSC 426-4	High Frequency Electronics
ENSC 428-4	Data Communications
ENSC 429-4	Discrete Time Systems

With permission, one or more Directed Studies courses may be chosen in this elective category.

(4) taken throughout the program, with formal registration in Semester 8, so nominal semester workload is 17 hours.

S.F.U.
September 11, 1985

ROBOTICS CONCENTRATION

The Electronics Engineering program includes a concentration in Robotics as an optional field of study. It is recommended that students interested in Robotics utilize their elective courses as follows:

Scie I-3	PHYS 211-3	Intermediate Mechanics
Scie II-3	two of PHYS 355-3	Optics
& Scie III-3	KIN. 100-3	Introduction to Human Function and Structure
	KIN. 401-3	Mechanics of Human Movement

Cmpt I-3	CMPT 410-3	Artificial Intelligence Survey
Cmpt II-3	CMPT 384-3	Symbolic Computing
or	CMPT 380-3	Computational Linguistics
or	CMPT 411-3	Artificial Intelligence Topics

Math I-3	MATH 252-3	Vector Calculus I
Math II-3	CMPT 205-3	Introduction to Formal Topics in Computing Science

Ensc I-4	ENSC 460-4 Special Topics I - Robotics
Ensc II-4	ENSC 461-4 Special Topics II - Robotics
Ensc III-4	as specified for Electronics Engineering

MATHEMATICS CONCENTRATION

The Electronics Engineering program includes a concentration in Mathematics as an optional field of study. It is recommended that students interested in Mathematics utilize their elective courses as follows:

Scie I-3 & Scie II-3 & Scie III-3	three of:	MACM 316-3 Numerical Analysis I MATH 308-3 Linear Programming MATH 309-3 Continuous Optimizations MATH 322-3 Complex Variables MATH 310-3 Introduction to Ordinary Differential Equations MATH 387-3 Stochastic Processes
Cmpt I-3	MATH 243-3	Discrete Mathematics
Cmpt II-3	open	Computing Science elective
Math I-3	MATH 252-3	Vector Calculus I
Math II-3	open	Mathematics elective
Ensc I-4	as specified for	Electronics Engineering
Ensc II-4	"	
Ensc III-4	"	

S.F.U.

ENGINEERING PHYSICS (ELECTRONICS)

COURSES AND TYPICAL SCHEDULE September 11, 1985

SEMESTER FIVE

Cmpl III-3	third complementary studies elective
CMPT 391-3	Microcomputer Hardware Workshop
ENSC 300-3	Engineering Design and Management
ENSC 321-4	Electronic Design II
Math II-3	second Mathematics elective
PHYS 211-3	Intermediate Mechanics

19 semester hours credit

SEMESTER SIX

ENSC 301-3	Engineering Economics
ENSC 327-4	Communication Systems
PHYS 324-3	Electromagnetics
PHYS 344-3	Thermal Physics
PHYS 355-3	Optics
PHYS 385-3	Quantum Physics

19 semester hours credit

SEMESTER SEVEN

Cmpl IV-3	fourth complementary studies elective
Ensc I-4	first Engineering Science elective(3)
ENSC 382-4	Control System Design
ENSC 495-1	Introduction to Microelectronic Fabrication
ENSC 498-3	Industrial Internship II
PHYS 365-3	Semiconductor Physics

18 semester hours credit

SEMESTER EIGHT

Ensc II-4	second Engineering Science elective(3)
Ensc III-4	third Engineering Science elective (3)
ENSC 100-6	Engineering Communications(4)
ENSC 499-9	Engineering Science Project
PHYS 465-3	Solid State Physics

26 semester hours credit

TOTAL 160 semester hours credit

(2) An approved course in a basic, applied or mathematical science

(3) Chosen from:

ENSC 425-4	Electronic System Design
ENSC 426-4	High Frequency Electronics
ENSC 428-4	Data Communications
ENSC 429-4	Discrete Time Systems

With permission, one or more Directed Studies courses may be chosen in this elective category.

(4) taken throughout the program, with formal registration in Semester 8, so nominal semester workload is 20 hours.

COMPUTER ENGINEERING

COURSES AND TYPICAL SCHEDULE — September 11, 1985

SEMESTER FIVE

Cmpl III-3	third complementary studies elective
Cmpt I-3	first Computing Science elective(5)
CMPT 205-3	Introduction to Formal Topics in Computing Science
CMPT 391-3	Microcomputer Hardware Workshop
ENSC 300-3	Engineering Design and Management
ENSC 321-4	Electronic Design II

19 semester hours credit

SEMESTER SIX

Cmpt II-3	second Computing Science elective(5)
CMPT 393-4	Systems Software for Minicomputers & Microcomputers
CMPT 400-3	Hardware Architecture
ENSC 301-3	Engineering Economics
ENSC 327-4	Communication Systems
Scie I-3	science elective(2)

20 semester hours credit

SEMESTER SEVEN

Cmpl IV-3	fourth complementary studies elective
CMPT 401-3	Operating Systems
Ensc I-4	first Engineering Science elective(3)
ENSC 382-4	Control System Design
ENSC 498-3	Industrial Internship II
Math II-3	second Mathematics elective(5)

20 semester hours credit

SEMESTER EIGHT

ENSC 100-6	Engineering Communications(4)
Ensc II-4	second Engineering Science elective (3)
ENSC 429-4	Discrete Time Systems
ENSC 499-9	Engineering Science Project

23 semester hours credit

TOTAL 160 semester hours credit

(2) An approved course in a basic, applied or mathematical science

(3) Chosen from:
ENSC 425-4 Electronic System Design
ENSC 426-4 High Frequency Electronics
ENSC 428-4 Data Communications
With permission, one or more Directed Studies courses may be chosen in this elective category.

(4) taken throughout the program, with formal registration in Semester 8, so nominal semester workload is 17 hours.

(5) In addition to CMPT or MATH courses, as appropriate, students may elect from:
MACM 306-3 Introduction to Automata Theory
MACM 401-3 Switching Theory and Logical Design
MACM 402-3 Automata and Formal Languages

BIOMEDICAL ENGINEERING (ELECTRONICS)

COURSES AND TYPICAL SCHEDULE September 11, 1985

SEMESTER FIVE

BISC 101-4	Introduction to Biology
CMPT 391-3	Microcomputer Hardware Workshop
ENSC 300-3	Engineering Design and Management
ENSC 321-4	Electronic Design II
KIN. 100-3	Introduction to Human Structure and Function

17 semester hours credit

SEMESTER SIX

BISC 102-4	Introduction to Biology
Cmpl III-3	third complementary studies elective
ENSC 301-3	Engineering Economics
ENSC 327-4	Communication Systems
Math II-3	second Mathematics elective
Scie I-3	first science elective(2)

20 semester hours credit

SEMESTER SEVEN

Cmpl IV-3	fourth complementary studies elective
Ensc I-4	first Engineering Science elective (3)
ENSC 382-4	Control System Design
ENSC 498-3	Industrial Internship II
Scie II-3	second science elective(2)
Scie III-3	third science elective(2)

20 semester hours credit

SEMESTER EIGHT

Ensc II-4	second Engineering Science elective(3)
ENSC 100-6	Engineering Communications(4)
ENSC 451-3	Seminar in Biomedical Engineering(5)
ENSC 499-9	Engineering Science Project
Scie IV-3	fourth science elective(2)

25 semester hours credit

TOTAL 160 semester hours credit

(2) an approved course in a basic, applied or mathematical science of which at least two must be from the following:

KIN. 305-3 Human Physiology I
KIN. 306-3 Human Physiology II
KIN. 401-4 Mechanics of Human Movement
KIN. 402-4 Mechanical Properties of Tissues
KIN. 407-3 Human Physiology Laboratory
KIN. 442-3 Biomedical Systems
KIN. 480-3 Human Factors in Working Environments

Students should note that the prerequisites for several of these courses are not provided in the Biomedical Engineering program. Other sections of this Calendar and, if necessary, the School of Kinesiology should be consulted by students interested in KIN. 305, 306 and 407.

(3) Chosen from:

ENSC 425-4 Electronic System Design
ENSC 426-4 High Frequency Electronics
ENSC 428-4 Data Communications
ENSC 429-4 Discrete Time Systems

With permission, one or more Directed Studies courses may be chosen in this elective category.

(4) taken throughout the program, with formal registration in Semester 8, so nominal semester workload is 19 hours.

(5) will not be given every year; students should take at the earliest opportunity.

COMPUTING SCIENCE COURSES

The following courses are either required, or acceptable as electives, in Engineering Science:

CMPT 101-4
CMPT 105-3
CMPT 201-4
CMPT 205-3
CMPT 275-3
CMPT 290-3
CMPT 305-3
CMPT 340-3
CMPT 351-3
CMPT 354-3
CMPT 380-3
CMPT 383-3
CMPT 384-3
CMPT 390-3
CMPT 391-3
CMPT 393-4
CMPT 400-3
CMPT 401-3
CMPT 404-4
CMPT 405-3
CMPT 406-3
CMPT 410-3
CMPT 411-3
CMPT 451-3
CMPT 483-3
CMPT 484-3
CMPT 495-3

In addition, CMPT 320-3 may be used to satisfy the "interaction between technology and society" course requirement or as a course in "humanities, social sciences or administrative studies".

Revised Course Descriptions for Engineering Science

Engineering Communications

Engineering Communications is designed to develop the student's written, verbal and graphical communication skills. This work is spread throughout the duration of the engineering program. Grading is based not only on participation in the various Engineering Communications activities but also includes evaluation of laboratory reports, course essays and project reports. The student will register for one component of the course each semester. These courses are graded on a pass/fail basis.

ENSC 101-0 Engineering Communications I
The first component of Engineering Communications for students in the first semester of the Engineering Science program.

ENSC 102-1 Engineering Communications II
The second component of Engineering Communications for students in the second semester of the Engineering Science program.

ENSC 103-1 Engineering Communications III
The third component of Engineering Communications for students in the third semester of the Engineering Science program.

ENSC 104-1 Engineering Communications IV
The fourth component of Engineering Communications for students in the fourth semester of the Engineering Science program.

ENSC 105-1 Engineering Communications V
The fifth component of Engineering Communications for students in the fifth semester of the Engineering Science program.

ENSC 106-1 Engineering Communications VI
The sixth component of Engineering Communications for students in the sixth semester of the Engineering Science program.

ENSC 107-1 Engineering Communications VII
The seventh component of Engineering Communications for students in the seventh semester of the Engineering Science program.

ENSC 108-0 Engineering Communications VIII
The eighth component of Engineering Communications for students in the eighth semester of the Engineering Science program.

ASU 85-4(a)

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 101 Credit Hours: 0 Vector: n/a

Title of Course: Engineering Communications

Calendar Description of Course:

See attached.

Nature of Course Seminar

Prerequisites (or special instructions):

What course (courses), if any, is being dropped from the calendar if this course is approved: ENSC 100-6

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-1

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To allow scheduling of Engineering Communications in the first semester of the ENSC program.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 85 11 25 | 25/11/85 |

JK Cavers for DA George
Department Chairman

Dean

Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 102 Credit Hours: 1 Vector: n/a

Title of Course: Engineering Communications

Calendar Description of Course:

See attached.

Nature of Course Seminar

Prerequisites (or special instructions):

ENSC 101

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 100-6

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? Fall 1986

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To improve ENSC students' communications skills.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 85 11 25 25/11/85

JK Cavers for DA George
Department Chairman

Dean

Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 103 Credit Hours: 1 Vector: n/a

Title of Course: Engineering Communications

Calendar Description of Course:

See attached.

Nature of Course Seminar

Prerequisites (or special instructions):

ENSC 102

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 100-6

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? Fall 1986

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To improve ENSC students' communications skills.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 85 11 25 25/11/85

JK Cowers for DA George
Department Chairman

Dean

Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline)

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 104 Credit Hours: 1 Vector: n/a

Title of Course: Engineering Communications

Calendar Description of Course:

See attached.

Nature of Course Seminar

Prerequisites (or special instructions):

ENSC 103

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 100-6

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? Fall 1986

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To improve ENSC students' communications skills.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 85 11 25 85/11/25

JK Cowen for DA George
Department Chairman

Dean

Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 105 Credit Hours: 1 Vector: n/a

Title of Course: Engineering Communications

Calendar Description of Course:

See attached.

Nature of Course Seminar

Prerequisites (or special instructions):

ENSC 104

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 100-6

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? Fall 1986

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To improve ENSC students' communications skills.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 85 11 25 — 25/11/85

K Cowell for DA George — Department Chairman

Dean

Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 106 Credit Hours: 1 Vector: n/a

Title of Course: Engineering Communications

Calendar Description of Course:

See attached.

Nature of Course Seminar

Prerequisites (or special instructions):

ENSC 105

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 100-6

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? Fall 1986

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To improve ENSC students' communications skills.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 85 11 25 — 85/11/25

JK Cawes for DA George — Department Chairman

Dean

Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 107 Credit Hours: 1 Vector: n/a

Title of Course: Engineering Communications

Calendar Description of Course:

See attached.

Nature of Course Seminar

Prerequisites (or special instructions):

ENSC 106

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 100-6

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? Fall 1986

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To improve ENSC students' communications skills.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 85 11 25

JK Cavers for DA George
Department Chairman

Dean

Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 108 Credit Hours: 0 Vector: n/a

Title of Course: Engineering Communications

Calendar Description of Course:

See attached.

Nature of Course Seminar

Prerequisites (or special instructions):

ENSC 107

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 100-6

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? Fall 1986

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To allow scheduling of Engineering Communications in the eight semester of the ENSC program.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 85 11 25 25/11/85

JK Cavers for DA George

Department Chairman Dean Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 125 Credit Hours: 5 Vector: 3-0-4

Title of Course: Basic Electronics Engineering

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):
PHYS 121, 131
Co-requisite: MATH 251

What course (courses), if any, is being dropped from the calendar if this course is approved:
ENSC 225-3 and 291-2

2. Scheduling

How frequently will the course be offered? Once per year

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To give students both a general introduction to the area of electronics engineering and a solid basis in the fundamentals on which all other ENSC courses build.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85	1/11/85	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 125-5 *Basic Electronics Engineering* *[replaces ENSC 225-3 & 291-2]*

[3,0,4] *Nature and properties of electrical circuits; basic circuit elements; voltage and current sources; Kirchoff's laws; linearity and superposition; Thevenin and Norton Theorems. DC circuits. AC signals and phasors. AC steady state circuit analysis: impedance, admittance and transfer properties; frequency response; detailed treatment of first order (RL and RC) circuits; properties of LCR circuits. Basic characteristics of diodes and the transistor as a switch, with applications. Introduction to transient response. Basics of feedback control, communication and digital systems. Two semester-hours credit in laboratory work is included in this course.*

Prerequisites: PHYS 121, 131.

Corequisites: MATH 251

EDITORIAL CHANGE to PREREQ.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 195 Credit Hours: 0 Vector: n/a

Title of Course: Job Practicum I

Calendar Description of Course:

See Attached.

Nature of Course Practicum

Prerequisites (or special instructions):

Students must register with the School Internship Coordinator by the end of the third week of the semester preceding the work semester.

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? As required

Semester in which the course will first be offered? 86-2

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To provide extended Job Practicum opportunities in ENSC program

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85	1/11/85	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 195-0 Job Practicum I

This is a first semester of optional work experience in the Industrial Internship program available to engineering students. Credit is given as Pass/Withdraw (P,W) only, based on the employer's evaluation of the student's work during the semester and of the work report submitted at the end of the work session.

Prerequisite: students must register with the School Internship Coordinator by the end of the third week of the semester preceding the work semester.

EDITORIAL CHANGE TO PREREQUISITE

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 196 Credit Hours: 0 Vector: n/a

Title of Course: Job Practicum II

Calendar Description of Course:

See Attached.

Nature of Course Practicum

Prerequisites (or special instructions):

ENSC 195. Students must register with the School Internship Coordinator by the end of the third week of the semester preceding the work semester.

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? As required

Semester in which the course will first be offered? 86-2

Which of your present faculty would be available to make the proposed offering possible? n/a

3. Objectives of the Course

To provide extended Job Practicum opportunities in ENSC program

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85 1/11/85

Department Chairman Dean Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 196-0 Job Practicum II

This is the second semester of optional work experience in the Industrial Internship program available to engineering students. Credit is awarded as in ENSC 195. ENSC 196 may or may not involve the same employer as ENSC 195.

Prerequisite: ENSC 195. Students must apply to the School Internship coordinator by the end of the third week of the semester preceding the work session.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 222 Credit Hours: 5 Vector: 3-0-4

Title of Course: Electronic Design I

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

CMPT 291, ENSC 125

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 322-3 and 292-2

2. Scheduling

How frequently will the course be offered? Once per year.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To introduce students to a broad range of electronic components and techniques for designing electronic systems

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85 1/11/85

Department Chairman | Dean | Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 222-5 Electronic Design I *[replaces ENSC 322-3 & 292-2]*

[3,0,4] *Builds upon the material of CMPT 290-3 and ENSC 125-5 with an emphasis on the design of analog electronics. Topics: review of linear circuit analysis, electronic circuit simulation program (PSpice); non-linear characteristics and models of diodes; non-ideal performance of operational amplifiers, non-linear applications of diodes and operational amplifiers; active filters; biopolar junction transistors (BJT's), junction field-effect transistors (JFET's) and metal-oxide-semiconductor field-effect transistors (MOSFET's): qualitative device physics and terminal characteristics, transistors as switching elements; linear application, biasing, temperature effects and compensation; single-stage and multistage transistor amplifiers and differential stages. Two semester-hours credit in laboratory work is included in this course.*

Prerequisites: CMPT 291, ENSC 125

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 280 Credit Hours: 5 Vector: 3-0-4

Title of Course: Systems Dynamics

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):
MATH 152, 232
ENSC 125, 222

What course (courses), if any, is being dropped from the calendar if this course is approved:
ENSC 280, 293

2. Scheduling

How frequently will the course be offered? Once per year.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

Gives the student a basic understandign of time and frequency analysis of linear dynamic systems in preparation for later communication, control and signal processing courses

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/87	1/11/87	
Department Chairman	Dean	Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 280-5 Systems Dynamics *[replaces ENSC 280-3 & 293-2]*

[3,0,4] *Basic tools for modelling, analysis and design of linear dynamic systems. Introduces the student to: linearity and linearization of sytems, block diagrams and other basic modelling concepts; impulse response, step response, and convolution as general time domain descriptions, FIR and IIR systems; differential and difference equations for finite order systems, simulation diagrams; transform analysis (Laplace, Fourier, Z) and transfer functions as general frequency domain descriptions; discrete time approximations of continuous time systems. Laboratory projects include digital filtering, servo systems and system simulation packages. Two semester-hours credit in laboratory work is included in this course.*

Prerequisites: MATH 152, 232

ENSC 125, 222

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 295 Credit Hours: 0 Vector: n/a

Title of Course: Job Practicum III

Calendar Description of Course:

See attached.

Nature of Course Practicum

Prerequisites (or special instructions):

Completion of second year

What course (courses), if any, is being dropped from the calendar if this course is approved:

None

2. Scheduling

How frequently will the course be offered? As required

Semester in which the course will first be offered? 86-2

Which of your present faculty would be available to make the proposed offering possible?

n.a.

3. Objectives of the Course

To provide extended Job Practicum opportunities in ENSC program.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85	1 Nov/85	
J K Cowles for		
Department Chairman	Dean	Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 295-0 Job Practicum III

this is the third semester of optional work experience in the Industrial Internship program available to engineering students. Credit is awarded as in ENSC 195. ENSC 295 may or may not involve the same employers as preceding practicum semesters.

Prerequisite: completion of second year. Students must apply to the School Internship coordinator by the end of the third week of the semester preceding the work session.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 296 Credit Hours: 0 Vector: n/a

Title of Course: Job Practicum IV

Calendar Description of Course:

See attached.

Nature of Course Practicum

Prerequisites (or special instructions):

ENSC 295. Students must apply to the School Internship Coordinator by the end of the third week of the semester preceding the work session.

What course (courses), if any, is being dropped from the calendar if this course is approved:

None

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-2

Which of your present faculty would be available to make the proposed offering possible?

n.a.

3. Objectives of the Course

To provide extended Job Practicum opportunities in ENSC program.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85	1 Nov/85	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 296-0 Job Practicum IV

This is the fourth semester of optional work experience in the Industrial Internship program available to engineering students. Credit is awarded as in ENSC 195. ENSC 296 may or may not involve the same employers as preceding practicum semesters.

Prerequisite: ENSC 295. Students must apply to the School Internship coordinator by the end of the third week of the semester preceding the work session.

EDITORIAL CHANGES
PREREQUISITE CHANGE

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 300 Credit Hours: 3 Vector: 2-2-0

Title of Course: Engineering Design & Management

Calendar Description of Course:

See Attached.

Nature of Course Lecture

Prerequisites (or special instructions):

Upper Division Standing

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? Once per year.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? This course is intended to be taught by specialist brought in from industry on a sessional basis

3. Objectives of the Course

To expose students to the role of the engineer as a manager. To show engineering design as a process and to relate the engineering department to the rest of the organization.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: _____ _____ _____

_____ _____ _____

Department Chairman Dean Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline)

ENSC 300-3 *Engineering Design and Management*

[2,2,0] *An introduction and overview of modern concepts of engineering design, problem solving and management. Material is presented through lectures, seminars, case studies, and historical review. Studies involve the interrelationship of such factors as problem definition, feasibility studies, specification, constraints, analysis techniques, evaluation, production, project management, conflict resolution, techniques of supervision. Student participation is expected through presentations of independent readings, case analyses and group projects.*

Prerequisite: Upper Division Standing

EDITORIAL CHANGE
PREREQUISITE CHANGE

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 301 Credit Hours: 3 Vector: 3-0-0

Title of Course: Engineering Economics

Calendar Description of Course:

See Attached

Nature of Course Lecture

Prerequisites (or special instructions):

Upper Division Standing

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? Once per year

Semester in which the course will first be offered? 87-1

Which of your present faculty would be available to make the proposed offering possible? This course is intended to be taught by specialists brought in from industry on a sessional basis.

3. Objectives of the Course

To expose students to the financial aspects of the business of engineering.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/87 1/11/87

Department Chairman

Dean

Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline)

ENSC 301-3 Engineering Economics

[3,0,0] *The engineer as a businessman and entrepreneur. Preparation of a business plan. The economics of capital projects and production processes. Financial analysis, mortgages, loans, direct costs, depreciation, taxes, financial statements, financing alternatives. Estimation of sales, capital and operating costs of new processes and products. Cash flows. Market evaluation. Comparision of alternatives. Study is in part through independent reading rather than formal lectures.*

Prerequisite: Upper Division Standing

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 321 Credit Hours: 4 Vector: 3-0-2

Title of Course: Electronic Design II

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):
ENSC 222

What course (courses), if any, is being dropped from the calendar if this course is approved:
ENSC 421-3 and 491-1

2. Scheduling

How frequently will the course be offered? Once per year.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? P. Ho, A. Leung, S. Hardy, J. Cavers, D. George

3. Objectives of the Course

To enrich the students' knowledge of a broad range of electronic components and techniques for designing electronics systems.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: [illegible] [illegible]

Department Chairman | Dean | Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 321-4 *Electronic Design II* *[replaces ENSC 421-3 & 491-1]*

[3,0,2] *Different amplifier configurations will be analysed in detail. Students will be introduced to analog integrated circuit design and the analog aspects of digital electronics. Topics: high-frequency JFET and BJT models and amplifiers; feedback amplifiers, stability and frequency compensation, pole splitting, oscillators; tuned amplifiers: low-noise amplifier design; integrated-circuit technology, integrated-component characteristics and limitations, analysis of the 741 operational amplifier; logic-circuit families: Ebers-Moll model of BJT's, DTL, TTL, ECL, I^2L and CMOS. Laboratory work is included in this course.*

Prerequisite: ENSC 222

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 327 Credit Hours: 4 Vector: 3-0-2

Title of Course: Communication Systems

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

ENSC 280, MATH 272

What course (courses), if any, is being dropped from the calendar if this course is approved: ENSC 427-3 & 492-1

2. Scheduling

How frequently will the course be offered? Once per year

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? J. Cavers, P. Ho, S. Hardy, D. George

3. Objectives of the Course

Gives the student an analytical exposure to communication of waveforms in noise and distortion.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: .1.1.6 .1.1.6

Department Chairman Dean Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 327-4 *Communication Systems* *[replaces ENSC 427-3 & 492-1]*

[3,0,2] *Representation of signals; Fourier series and transforms; time and frequency convolution. Amplitude modulation: circuits and systems, single sideband, vestigal sideband. Angle modulation: phase and frequency modulation, circuits and systems. Representation of random signals: correlation, power spectra, processing in linear systems. Effect of noise on different modulation sytems, thresholds in FM, system design and link budgets. Digital modulation techniques and basics of detection. Laboratory work is included in this course.*

Prerequisites: ENSC 280, MATH 272

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 382 Credit Hours: 4 Vector: 2-0-4

Title of Course: Control System Design

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

ENSC 280

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 382-3, 493-1

2. Scheduling

How frequently will the course be offered? Once per year

Semester in which the course will first be offered? 87-1

Which of your present faculty would be available to make the proposed offering possible? T. McGeer, J. Cavers, D. George

3. Objectives of the Course

To give the student a physical and mathematical introduction to the control of systems which can be modelled by ordinary differential equations.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85 1/11/85

Department Chairman | Dean | Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 382-4 *Control System Design* *[replaces ENSC 382-3 & 493-1]*

[2,0,4] *Review of Laplace transform techniques. Effects of feedback: frequency response, pole-zero positions. Compensation design: root locus, Bode plots. State variables: formulation, solution of linear systems. Examples of simple second-order non-linear systems. Discrete time systems, Z-transforms, signal reconstruction, sample-and-hold circuits. Introduction to optimum control. Laboratory work is included in this course.*

Prerequisite: ENSC 280

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 395 Credit Hours: 0 Vector: n/a

Title of Course: Job Practicum V

Calendar Description of Course:

See attached.

Nature of Course Practicum

Prerequisites (or special instructions):

Completion of third year. Students must apply to the School Internship Coordinator by the end of the third week of the semester preceding the work session.

What course (courses), if any, is being dropped from the calendar if this course is approved:

none.

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-2

Which of your present faculty would be available to make the proposed offering possible? n.a.

3. Objectives of the Course

To provide extended Job Practicum opportunities in ENSC program.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85 1 Nov/85

Department Chairman

Dean

Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 395-0 Job Practicum V

this is the fifth semester of optional work experience in the Industrial Internship program available to engineering students. Credit is awarded as in ENSC 195. ENSC 395 may or may not involve the same employers as preceding practicum semsters.

Prerequisite: completion of third year. Students must apply to the School Internship coordinator by the end of the third week of the semester preceding the work session.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 396 Credit Hours: 0 Vector: n/a

Title of Course: Job Practicum VI

Calendar Description of Course:

See attached.

Nature of Course Practicum

Prerequisites (or special instructions):

ENSC 395. Students must apply to the School Internship Coordinator by the end of the third week of the semester preceding the work session.

What course (courses), if any, is being dropped from the calendar if this course is approved: None.

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-2

Which of your present faculty would be available to make the proposed offering possible?

N.A.

3. Objectives of the Course

To provide extended Job Practicum opportunities in ENSC program.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85 1 Nov/85

Department Chairman Dean Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 396-0 Job Practicum VI

This is the sixth semester of optional work experience in the Industrial Internship program available to engineering students. Credit is awarded as in ENSC 195. ENSC 396 may or may not involve the same employers as preceding practicum semesters.

Prerequisite: ENSC 395. Students must apply to the School Internship coordinator by the end of the third week of the semester preceding the work session.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 400 Credit Hours: 4 Vector: 3-0-2

Title of Course: Directed Studies in Engineering Science

Calendar Description of Course:

See Attached.

Nature of Course Directed Study

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved: None.

2. Scheduling

How frequently will the course be offered? As required

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To provide opportunity for further research and study outside of regular courses.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: Jan 15

Department Chairman	Dean	Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 400-4 Directed Studies in Engineering Science [replaces ENSC 400-3]

ENSC 401-4 Directed Studies in Engineering Science [replaces ENSC 401-3]

ENSC 402-4 Directed Studies in Engineering Science [replaces ENSC 402-3]

[3,0,2] Directed reading and research in a topic chosen in consultation with a supervisor. Admission requires agreement by a proposed faculty supervisor and submission of a proposal to the School at least one month prior to the start of the semester in which the course will be taken.

Prerequisite: Permission of the Director

URGENT HOUR CHANGE

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 401 Credit Hours: 4 Vector: 3-0-2

Title of Course: Directed Studies in Enginering Science

Calendar Description of Course:

See Attached.

Nature of Course Directed Study

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved: None.

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To provide opportunity for further research and study outside of regular courses.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/15	1/15	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 400-4 Directed Studies in Engineering Science [replaces ENSC 400-3]

ENSC 401-4 Directed Studies in Engineering Science [replaces ENSC 401-3]

ENSC 402-4 Directed Studies in Engineering Science [replaces ENSC 402-3]

[3,0,2] Directed reading and research in a topic chosen in consultation with a supervisor. Admission requires agreement by a proposed faculty supervisor and submission of a proposal to the School at least one month prior to the start of the semester in which the course will be taken.

Prerequisite: Permission of the Director

CREDIT HOUR CHANGE

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 402 Credit Hours: 4 Vector: 3-0-2

Title of Course: Directed Studies in Enginering Science

Calendar Description of Course:

See Attached.

Nature of Course Directed Study

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved: None.

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To provide opportunity for further research and study outside of regular courses.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/16/85 1/16/85

Department Chairman | Dean | Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 400-4 Directed Studies in Engineering Science [replaces ENSC 400-3]

ENSC 401-4 Directed Studies in Engineering Science [replaces ENSC 401-3]

ENSC 402-4 Directed Studies in Engineering Science [replaces ENSC 402-3]

[3,0,2] Directed reading and research in a topic chosen in consultation with a supervisor. Admission requires agreement by a proposed faculty supervisor and submission of a proposal to the School at least one month prior to the start of the semester in which the course will be taken.

Prerequisite: Permission of the Director

CREDIT HOUR CHANGE

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 425 Credit Hours: 4 Vector: 2 0-4

Title of Course: Electronic System Design

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

ENSC 222

What course (courses), if any, is being dropped from the calendar if this course is approved: ENSC 425-3 & 494-1

2. Scheduling

How frequently will the course be offered? once per year

Semester in which the course will first be offered? 87-1

Which of your present faculty would be available to make the proposed offering possible? J. Cavers, A. Leung, P. Ho, S. Hardy

3. Objectives of the Course

To develop an advanced understanding of design techniques for electronic systems.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/86 11/11/86

Department Chairman — Dean — Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a.

ENSC 425-4 *Electronic System Design* *[replaces ENSC 425-3 & 494-1]*

[2,0,4] *Aspects of design using digital and analog integrated circuits as circuit blocks for the realization of required system functions are treated, with project activities in the laboratory. Topics include differential amplifiers; operational amplifiers - non-ideal aspects; slew rate, gain error, sensitivites. Active filter design, D/A and A/D conversion. MSI and LSI digital circuits, combinational and sequential: decoders, encoders, multiplexers, ROM's, counters, controllers. Communication circuits: AM and FM modulators and demodulators, multiplexers, pulse modulation. Laboratory work is included in this course.*

Prerequisite: ENSC 222

Acc Dir Hour Change

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 426 Credit Hours: 4 Vector: 3-0-2

Title of Course: High Frequency Electronics

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

PHYS 324

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? Once per year.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible?

Basil Peters (Adjunct Professor)

3. Objectives of the Course

Gives the student a detailed exposure to techniques of radio frequency electronics from both analytical and practical viewpoints.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85 1/11/85

Department Chairman | Dean | Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 426-4 *High Frequency Electronics* *[replaces ENSC 426-3 & 49X-1]*

[3,0,2] *Transmission lines and waveguides, microwave devices, travelling wave devices. An introduction to the theory of radiation, antennae and wave propagation, and microwave scattering theory. The design of complete communication systems incorporating microwave, optical and satellite channels. Laboratory work is included in this course.*

Prerequisite: PHYS 324

CREDIT HOUR CHANGE

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 428 Credit Hours: 4 Vector: 3-0-2

Title of Course: Data Communications

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

ENSC 327 and CMPT 393

What course (courses), if any, is being dropped from the calendar if this course is approved: ENSC 428-3

2. Scheduling

How frequently will the course be offered? Once per year.

Semester in which the course will first be offered? 87-1

Which of your present faculty would be available to make the proposed offering possible?

J. Cavers, P. Ho, D. George

3. Objectives of the Course

Gives the student a broad exposure to problems of data communication at the lower levels of signal detection, error control, network protocols and perofrmance.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85 1/11/85

Department Chairman Dean Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 428-4 Data Communications *[replaces ENSC 428-3 & 49X-1]*

[3,0,2] *Channel models and detection techniques for digital signalling, including telephone channels, carrier and bit synch, equalization. Retransmission error control: HDLC as a model, software implementation methods and performance analysis. Forward error correction: Hamming, cyclic and convolutional codes, Viterbi algorithm. Packet network and local area network operation, interfaces, design and performance. Laboratory work is included in this course.*

Prerequisite: ENSC 327 and CMPT 393

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 429 Credit Hours: 4 Vector: 3-0-2

Title of Course: Discrete Time Systems

Calendar Description of Course:

See attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

ENSC 327

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 429-3, Digital Control Systems

2. Scheduling

How frequently will the course be offered? Once per year

Semester in which the course will first be offered? 86-3 or 87-1

Which of your present faculty would be available to make the proposed offering possible? Several.

3. Objectives of the Course

To expand the focus of Digital Control Sytems to general digital systems.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85	1 Nov/85	
K Cooper for		
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 429-4 Discrete Time Systems *[replaces ENSC 429-3 & 49X-1]*

[3,0,2] *Discrete-time control and signal processing systems, the Z-transform. Analog-to-digital and digital-to-analog conversion. Digital system architectures. Applications in control, filtering, electronics, signal processing. Introduction to adaptive systems.*

Prerequisite: ENSC 327

CREDIT HOUR CHANGE

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 460 Credit Hours: 4 Vector: 3-0-2

Title of Course: Special Topics in Engineering Science

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible?

All

3. Objectives of the Course

To provide further studies in areas not included in Engineering Science undergraduate course offerings.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85 1/11/85

Department Chairman

Dean

Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a.

ENSC 460-4 Special Topics in Engineering Science [replaces ENSC 460-3 & 49X-1]

ENSC 461-4 Special Topics in Engineering Science [replaces ENSC 461-3 & 49X-1]

ENSC 462-4 Special Topics in Engineering Science [replaces ENSC 462-3 & 49X-1]

[3,0,2] Studies in areas not included within the undergraduate course offerings of the Engineering Science Program.

Prerequisite: Permission of the Director

Option Head Change

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information — Department: Engineering Science

Abbreviation Code: ENSC Course Number: 461 Credit Hours: 4 Vector: 3-0-2

Title of Course: Special Topics in Engineering Science

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 87-1

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To provide further studies in areas not included in Engineering Science undergraduate course offerings.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85	1/11/85	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 460-4 Special Topics in Engineering Science [replaces ENSC 460-3 & 49X-1]

ENSC 461-4 Special Topics in Engineering Science [replaces ENSC 461-3 & 49X-1]

ENSC 462-4 Special Topics in Engineering Science [replaces ENSC 462-3 & 49X-1]

[3,0,2] Studies in areas not included within the undergraduate course offerings of the Engineering Science Program.

Prerequisite: Permission of the Director

Credit Hour Change

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 462 Credit Hours: 4 Vector: 3-0-2

Title of Course: Special Topics in Engineering Science

Calendar Description of Course:

See Attached.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 87-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To provide further studies in areas not included in Engineering Science undergraduate course offerings.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/87	1/11/87	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 460-4 Special Topics in Engineering Science [replaces ENSC 460-3 & 49X-1]

ENSC 461-4 Special Topics in Engineering Science [replaces ENSC 461-3 & 49X-1]

ENSC 462-4 Special Topics in Engineering Science [replaces ENSC 462-3 & 49X-1]

[3,0,2] Studies in areas not included within the undergraduate course offerings of the Engineering Science Program.

***Prerequisite:** Permission of the Director*

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 491 Credit Hours: 1 Vector: 0-2-0

Title of Course: Special Project Laboratory

Calendar Description of Course:

See attached.

Nature of Course Laboratory

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved:

491-2

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible?

All

3. Objectives of the Course

To allow students to undertake specific laboratory research in an area outside standard courses.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85	1 Nov/85	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 491-1 Special Project Laboratory

ENSC 492-2 Special Project Laboratory

ENSC 493-3 Special Project Laboratory

ENSC 494-4 Special Project Laboratory

These courses are intended for students wishing to pursue laboratory research on a specific topic outside the standard course offerings. Each student must be sponsored by a faculty member who will oversee the project. A proposal of the student's Special Project must be submitted to the School at least one month prior to the start of the semester in which the course will be taken. The credit value of the project will be assessed during this review phase and the student will be directed to register in the appropriate course.

Prerequisites: Upper Division Standing, sponsorship of a faculty member and permission of the Director.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 492 Credit Hours: 2 Vector: 0-4-0

Title of Course: Special Project Laboratory

Calendar Description of Course:

See attached.

Nature of Course Laboratory

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved:

492-2

2. Scheduling

How frequently will the course be offered? As required

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible?

All

3. Objectives of the Course

To allow students to undertake specific laboratory research in an area outside standard courses.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85 1 Nov/85

K Caves for
Department Chairman

Dean

Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 491-1 Special Project Laboratory

ENSC 492-2 Special Project Laboratory

ENSC 493-3 Special Project Laboratory

ENSC 494-4 Special Project Laboratory

These courses are intended for students wishing to pursue laboratory research on a specific topic outside the standard course offerings. Each student must be sponsored by a faculty member who will oversee the project. A proposal of the student's Special Project must be submitted to the School at least one month prior to the start of the semester in which the course will be taken. The credit value of the project will be assessed during this review phase and the student will be directed to register in the appropriate course.

Prerequisites: Upper Division Standing, sponsorship of a faculty member and permission of the Director.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 493 Credit Hours: 3 Vector: 0-6-0

Title of Course: Special Project Laboratory

Calendar Description of Course:

See attached.

Nature of Course Laboratory

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved:

493-2

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible?

All

3. Objectives of the Course

To allow students to undertake specific laboratory research in an area outside standard courses.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/95	1 Nov/95	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 491-1 Special Project Laboratory

ENSC 492-2 Special Project Laboratory

ENSC 493-3 Special Project Laboratory

ENSC 494-4 Special Project Laboratory

These courses are intended for students wishing to pursue laboratory research on a specific topic outside the standard course offerings. Each student must be sponsored by a faculty member who will oversee the project. A proposal of the student's Special Project must be submitted to the School at least one month prior to the start of the semester in which the course will be taken. The credit value of the project will be assessed during this review phase and the student will be directed to register in the appropriate course.

Prerequisites: Upper Division Standing, sponsorship of a faculty member and permission of the Director.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 494 Credit Hours: 4 Vector: 0-8-0

Title of Course: Special Project Laboratory

Calendar Description of Course:

See attached.

Nature of Course Laboratory

Prerequisites (or special instructions):

Permission of the Director

What course (courses), if any, is being dropped from the calendar if this course is approved:

494-2

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To allow students to undertake specific laboratory research in an area outside standard courses.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85	1 Nov/85	
J K Cowper for		
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 491-1 Special Project Laboratory

ENSC 492-2 Special Project Laboratory

ENSC 493-3 Special Project Laboratory

ENSC 494-4 Special Project Laboratory

These courses are intended for students wishing to pursue laboratory research on a specific topic outside the standard course offerings. Each student must be sponsored by a faculty member who will oversee the project. A proposal of the student's Special Project must be submitted to the School at least one month prior to the start of the semester in which the course will be taken. The credit value of the project will be assessed during this review phase and the student will be directed to register in the appropriate course.

Prerequisites: Upper Division Standing, sponsorship of a faculty member and permission of the Director.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 495 Credit Hours: 1 Vector: 0-0-2

Title of Course: Introduction to Microelectronic Fabrication

Calendar Description of Course:

See attached.

Nature of Course Laboratory

Prerequisites (or special instructions):

Upper Division Standing

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? Once per year, as required.

Semester in which the course will first be offered? 86-3 or 87-1

Which of your present faculty would be available to make the proposed offering possible? Dr. A.M. Leung

3. Objectives of the Course

To provide an introduction to microelectronic fabrication processes to Engineering Physics students.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None

Faculty

Staff Facility is being installed now.

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85 1 Nov/85

Department Chairman Dean Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 495-1 Introduction to Microelectronic Fabrication

[0,0,2] A review of microelectronic fabrication processes in greater depth than in regular electronics courses. Laboratory project work is involved. Intended for students in the Engineering Physics option.

Prerequisite: Upper Division Standing

EDITORIAL

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 497 Credit Hours: 0 Vector: n/a

Title of Course: Internship I

Calendar Description of Course:

See Attached.

Nature of Course Practicum

Prerequisites (or special instructions):

What course (courses), if any, is being dropped from the calendar if this course is approved:

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-2

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To gain relevant practical experience and to prepare for ENSC 498 and 499.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85	1/11/85	
Department Chairman	Dean	Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a.

ENSC 497-0 Internship I

This is the first session of the compulsory internship and consists of a semester of work experience arranged through the school's Industrial Internship Co-ordinator. The objective of this session is to gain relevant practical experience and to prepare for ENSC 498 and 499, where the project work intensifies and the student's undergraduate thesis is written. ENSC 497 is normally taken before the seventh academic semster.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 498 Credit Hours: 3 Vector: n/a

Title of Course: Internship II

Calendar Description of Course:

See attached.

Nature of Course Research Project

Prerequisites (or special instructions):

ENSC 497

What course (courses), if any, is being dropped from the calendar if this course is approved:

ENSC 499-11 will be reduced to 9 semester-hours

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-3

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To provide a more structured and orderly process for the undergraduate project and thesis requirement.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: NIL

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 25 Oct/85 1 Nov/85

Department Chairman	Dean	Chairman, SCUS

SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a. attach course outline).

ENSC 498-3 Internship II

This is the second session of compulsory internship and is usually taken during the seventh academic semester. The student's time in this course is devoted to supervised study, research and development and work leading to a formal proposal for the project work in ENSC 499. This activity can be directly augmented by other course work and by directed study. The locale of the work may be external to the University or within a University laboratory, or may bridge the two locations. Supervision may be by the company sponsoring the internship or by faculty members, or through some combination. A proposal for the student's ENSC 498 activities must be submitted to the School at least one month prior to the start of the semester in which the course will be taken. Preparation of the undergraduate thesis project proposal is the formal requirement of this course and the basis upon which it is graded. Grading will be on a Pass/Fail basis.

Prerequisite: ENSC 497

Prerequisite Change
Credit Change

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Engineering Science

Abbreviation Code: ENSC Course Number: 499 Credit Hours: 9 Vector: N/A

Title of Course: Engineering Science Project

Calendar Description of Course:

See Attached.

Nature of Course Thesis

Prerequisites (or special instructions):

ENSC 498

What course (courses), if any, is being dropped from the calendar if this course is approved: ENSC 499-11

2. Scheduling

How frequently will the course be offered? As required.

Semester in which the course will first be offered? 86-1

Which of your present faculty would be available to make the proposed offering possible? All

3. Objectives of the Course

To generate a thesis based on the research, development and engineering project undertaken in the student's internship.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 1/11/85 1/11/85

Department Chairman | Dean | Chairman, SCUS

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SCUS 73-34b: (When completing this form, for instructions see Memorandum SCUS 73-34a.

ENSC 499-9 Engineering Science Project *[replaces ENSC 499-11]*

A thesis is based on the research, development and engineering project undertaken in the student's internship. Registration for ENSC 499 takes place in the semester in which the thesis will be presented and defended, normally during Semester 8. Formal approval of the topic by the School of Engineering Science is given by the granting of the grade of Pass for ENSC 498. The locale of the work, supervision and other arrangements follow those for ENSC 498. Grading of the thesis will be on a Pass/Fail basis, but recognition will be given to outstanding work.

Prerequisite: ENSC 498