

SIMON FRASER UNIVERSITY

S.76-51

MEMORANDUM

To SENATE

From SENATE COMMITTEE ON UNDERGRADUATE
STUDIES

Subject NEW COURSE PROPOSAL - PHYS 334-4 -
INTRODUCTION TO ELECTRONICS

Date MARCH 19, 1976

MOTION:

"That Senate approve and recommend approval
to the Board of Governors, as set forth in
S.76-51, the new course proposal for PHYS 334-4
- Introduction to Electronics."

SIMON FRASER UNIVERSITY

S.7651

MEMORANDUM

To..... SENATE

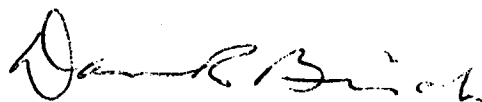
From..... SENATE COMMITTEE ON UNDERGRADUATE
STUDIESSubject NEW COURSE PROPOSAL:
PHYSICS 334-4, INTRO. TO ELECTRONICS

Date..... MARCH 19th, 1976

Action taken by the Senate Committee on Undergraduate Studies at its meeting of Tuesday, March 9, 1976, gives rise to the following MOTION that Senate approve and recommend approval to the Board of Governors Physics 334-4, Introduction to Electronics.

Rationale

The Committee discussed the rationale provided by the Physics Department and agreed that it is desirable to regularize recent practice by adding a lecture component to the course and by adjusting the credit correspondingly. S.C.U.S. has approved the first offering of this course in the Fall semester 1976.



D. R. Birch.

DRB:ged

SCUS 76-4

SIMON FRASER UNIVERSITY

MEMORANDUM

To H. Evans, Secretary
Senate Committee on
Undergraduate Studies
Subject..... PHYS 334-4: INTRODUCTION TO
ELECTRONICS

From... S. Arenoff, Dean *S. Arenoff*
Faculty of Science
Date... February 20, 1976

At its meeting of February 19, 1976 the Faculty of Science passed the following motion, unopposed:

"That the Faculty approve new course proposal PHYS 334-4, Introduction to Electronics, and forward to SCUS for consideration."

The supporting documentation for this proposal is attached. A waiver of the time lag requirement is requested in order that this course may be offered in the Summer Semester 76-2.

/pel
Encl.

RECEIVED
FEB 22 1976

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: PHYSICS

Abbreviation Code: PHYS Course Number: 334-4 Credit Hours: 4 Vector: 1-0-4

Title of Course: INTRODUCTION TO ELECTRONICS

Calendar Description of Course: Lectures and experiments in fundamental electronics, A.C. circuits, complex impedance analysis, filters and resonance circuits. Physics of active devices, equivalent circuits. Diodes. Theory and construction of amplifiers using triodes and transistors. Negative feedback, positive feedback and oscillators and multivibrators. Operational amplifiers,

Nature of Course integrated circuits, analog circuits.

Prerequisites (or special instructions): Laboratory with accompanying lectures.

PHYS 205-2 and at least 3 semester hours of credit in 200 division laboratories.
Students with credit for PHYS 331-3 may not take this course for further credit.

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

P 331-3

2. Scheduling

How frequently will the course be offered? Twice a year.

Semester in which the course will first be offered? Fall semester 76-3

Which of your present faculty would be available to make the proposed offering possible? A.S. Arrott, B.P. Clayman, J.F. Cochran, K. Colbow, E.D. Crozier, A.E. Curzon, R.F. Frindt, S. Gyax, D.J. Huntley, J.C. Irwin, L.H. Palmer,

3. Objectives of the Course

K.E. Rieckhoff.

P334- will provide a theoretical and experimental introduction to the fundamentals of electronics. It will provide a basic background essential to successful instrumentation in the physical sciences.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty Nil

Staff Nil

Library Nil

Audio Visual Nil

Space Nil

Equipment Nil

5. Approval

Date: 8 OCTOBER 75

20/F/76

A.E. Curzon
Department Chairman

S. Arrott
Dean

Chairman, SCUS

RATIONALE

Physics 334-4 is designed to replace a course that is presently offered under the designation Physics 331-3 - Intermediate Laboratory I. Phys 334-4 will include the laboratory experiments that are presently performed in Physics 331-3 and in addition one lecture per week will be given. It has been found necessary to incorporate lectures into the course to provide an introduction to the theory and principles on which the laboratory experiments are based. For the last two years these lectures (one per week) have been given voluntarily by faculty and attended by students without any accompanying credit. Physics 334-4 is being introduced to rectify this situation by giving an amount of credit compatible with the work load required.

LIST OF EXPERIMENTS

1. Introduction to multimeters, signal generators, oscilloscope.
2. Complex Impedance I: high and low pass filters.
3. Complex Impedance II: resonance circuits.
4. Diodes.
5. I.V. characteristics of active devices (triode, FET, NPN transistor).
6. Amplifiers I: triode and FET amplifiers
Common cathode (source), Cathode (source) Follower.
7. Amplifiers II: NPN amplifiers
Common emitter, emitter follower, common base
Darlington pair.
8. Amplifiers III: frequency response of triode and junction
transistor amplifier, RC coupled 2-stage
transistor amplifier with negative feedback.
9. Positive feedback & Oscillators
RC phase shift oscillator, Colpitts oscillator,
unijunction relaxation oscillator.
10. Negative feedback & operational amplifiers
Simple analogue computation, (addition, sub-
tracting, multiplication, division, squaring,
square "rooting", integration, differentiation).
11. Multivibrators.
12. Analogue Circuits
analogue solutions to linear algebraic equations,
elementary linear and non-linear differential
equations.

LECTURE TOPICS

1. A.C. circuit theory, complex impedance, RC filters.
2. Series and Parallel resonance circuits.
3. Introductory band theory: electron in a box, metals, intrinsic semiconductors, extrinsic semiconductors, contact potential, p-n junction, rectifier equation.
4. Equivalent circuits;
Diode equivalent circuit, Thevenin's and Norton's theorems, Triode equivalent circuit and sample calculations of voltage gain, input, and output impedance.
5. Physics of the FET and equivalent circuits.
6. Physics of the junction transistor. The equivalent circuits for junction transistor and sample calculations for common emitter, emitter follower and common base configurations. Brief discussion of hybrid equivalent circuits.
7. Effect of negative feedback on amplifier performance.
8. Positive feedback and oscillators. Detailed discussion of phase shift oscillator.
9. Negative feedback and operational amplifier.
10. Multivibrators.

SIMON FRASER UNIVERSITY

MEMORANDUM

To: (See Distribution Below)

From: E. Lambert

Faculty of Science

Subject: PHYS 334-4 COURSE OVERLAP

Date: November 12, 1975

In accordance with SCUS 75-27 the attached documentation on course proposal PHYS 334-4 "Introduction to Electronics" is forwarded to faculty curriculum committees for review in terms of course overlap. It should be noted that this represents the addition of a lecture to a course which has been in existence for ten years.

E. Lambert

/pel
Encl.

Distribution: J. Weinkam, Interdisciplinary Studies
L. Boland, Faculty of Arts
S. O'Connell, Faculty of Education