

SIMON FRASER UNIVERSITY

S. 77-87

MEMORANDUM

To SENATE

From SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Subject NEW COURSE - PHYS 150-3

Date JUNE 16, 1977

MOTION:

"That Senate approve and recommend approval to the Board of Governors, as set forth in S.77-87, the new course, PHYS 150-3 - Elementary Physics of Electronic Devices, and the change in prerequisites for PHYS 101 and PHYS 120."

(SCUS approved waiver of the time lag requirement to permit first offering for Spring 78-1.)

*W. Birch*

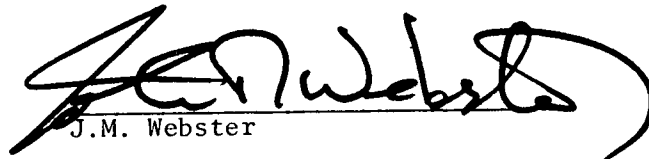
SIMON FRASER UNIVERSITY

SCUS 77-31

MEMORANDUM

To.....	H. Evans	From.....	J.M. Webster
	Secretary of SCUS		Dean of Science
Subject.....	PHYS 150-3	Date.....	May 30, 1977

Attached please find a proposal for a new course, PHYS 150-3, "Elementary Physics of Electronic Devices". This was approved by the Faculty of Science at its meeting of May 19, 1977, and is herewith forwarded to the Senate Committee on Undergraduate Studies for further consideration. We request a waiver of the time lag requirement in order that this course may be offered in semester 77-3. Also attached is the related prerequisite change for the next calendar.

  
 J.M. Webster

/pel  
 Encl.

RECEIVED

MAY 31 1977

Waiver Spring 78-1.

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: PHYSICS

Abbreviation Code: PHYS Course Number: 150 Credit Hours: 3 Vector: (2-1-2)

Title of Course: Elementary Physics of Electronic Devices

Calendar Description of Course:

Attached

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

CMPT 105-3; Math 150-3 or Math 151-3 or Math 154-3 (corequisite).  
Those students who have received

credit for Phys 101-3 or Phys 120-3 cannot subsequently receive credit for Phys 150-3.  
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? Once per annum or according to demand.

Semester in which the course will first be offered? 78-1

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

3. Objectives of the Course

Attached

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty -  $\frac{1}{2}$  Faculty member

Staff - .1 T.A.

Library - Nil

Audio Visual - Nil

Space - Nil

Equipment - \$5000.00. Most of the equipment needs can be met with present resources. However, we will require function generators and minor components (diodes, resistors, capacitors, etc.).

} If course is offered once per annum.

5. Approval

Date: A. E. Curzon

3-7-77

14 June 77

11 March 1977  
Department Chairman

A. P. W. D. [Signature]  
Dean

[Signature]  
Chairman, SCUS

PHYSICS 150

ELEMENTARY PHYSICS OF ELECTRONIC DEVICES

Course Outline

<u>Topics</u>	<u>Lectures</u>
1. Force, work, potential and kinetic energy. (no vectors)	4
2. Charge, Coulombs Law, Electric potential.	2
3. Current, resistance, Ohm's Law, D.C. meters.	2
4. D.C. circuits, Kirchoff's rules.	2
5. A.C. circuits, capacitance, integrators, differentiators, and qualitative discussion of bandwidth.	4
6. Magnetism, Induction, and ferromagnets.	4
7. Atomic energy levels, bands in solids, classification of solids, properties of semiconductors, and p-n junctions.	2
8. Elementary introduction to some electronic devices, for example, diodes, transistors, gates, charge coupled devices, and magnetic storage.	4
Total number of lectures	<u>24</u>

In addition to two lectures/week there will be a four hour laboratory every other week. Topics to be investigated in the laboratory include:

- (1) D.C. Meters and circuits
- (2) A.C. and the oscilloscope
- (3) Transients (RC circuits)
- (4) Diodes, logic gates

Textbook: No suitable text has been identified. However, the course could be adapted by combining material from two sources, for example:

*"Modern Technical Physics"* by A. Beiser  
- Addison Wesley 1966

*"Physics of the Atom"* by M.R. Wehr and J.A. Richards  
- Addison Wesley 1967

### Calendar Description of Course

An elementary physics course for non-science students who are involved in the use of electronic instrumentation. An introduction to the physics of electronic devices including topics such as force, work, energy, electrical forces, current, resistance, D.C. circuits, A.C. circuits, capacitance, magnetism, induction, and the classification of solids. A brief discussion of diodes, transistors, logic gates, charge coupled devices, and magnetic storage.

### Objectives of Course

To acquaint non-science students with some of the basic principles of physics. The student will gain sufficient background to enable him to acquire a rudimentary understanding of electronic devices and instruments.

## PHYSICS 150

### RATIONALE

This course is being mounted at the request of Drs. Weinkam and Calvert of the Computing Science Department. Many students in the computing science program become interested in the "hardware" aspects of computing and enroll in CMPT 290-3, "Introduction to Digital Systems" and CMPT 291-3, "Analogue and Digital Circuits". The benefit that students derive from such courses is severely limited, however, by their lack of background in the physical principles required for an understanding of electronic devices. This course is intended for these particular students and it is hoped that they will acquire sufficient background to enable them to gain at least a rudimentary understanding of digital components and systems.

The course should also be of interest to students in Psychology, Kinesiology, and Geography. Many students in these departments are not only involved in the use of computers, but in the use of electronic measuring apparatus as well. A better understanding of, and familiarity with, electronic devices should greatly enhance the benefits derived from many projects and courses encountered by students in these departments.

# SIMON FRASER UNIVERSITY

## MEMORANDUM

To..... Dr. A. Curzon, Chairman

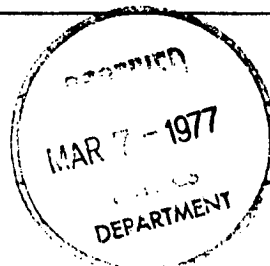
DEPARTMENT OF PHYSICS

Subject..... Physics 150-3

From..... T.W. Calvert, Professor,

KINESIOLOGY & COMPUTING SCIENCE

Date..... March 4th, 1977.



This is to confirm that the proposed course "Elementary Physics of Electronic Devices," should be very suitable for Computing Science students who intend to take CMPT 290, 291 and 390. I think that in fact the course should also have an appeal in Kinesiology, Psychology and Biosciences. It would be a good preliminary preparation for Physics 333.

We appreciate the co-operation of your department in designing this course.

A handwritten signature in cursive script, appearing to read "T.W. Calvert".

T.W. Calvert

TWC/gmc

CC: R. Hobson - Computing Science  
J.J. Weinkam  
C. Irwin - Physics

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

CHANGE OF PREREQUISITE

1. Calendar Information

Abbreviation Code: PHYS Course Number: 101 & 120

Department: Physics

Credit Hours: 3 Vector: (3-1-0)

Title of Course:

Calendar Description of Course:

Nature of Course

Prerequisites (or special instructions): Please add the following statement to the calendar entry for each of the above courses.

(or Phys 150-3 with the permission of the department).

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?

Semester in which the course will first be offered?

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

3. Objectives of the Course

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 31 March 77

30/5/77

14 June 77

A. E. Curry

[Signature]

[Signature]

Department Chairman

Dean

Chairman, SCUS