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Accession No.	434-29-0100
File Code No.	16-8-A1.1
Carton No.	51 of 38
Folder No.	30
Notes	PHYSICS 101ABC (New material)
Found By	Roberta Landauer
Dates	1948

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September 11, 1948

Professor S. F. Cook
Chairman, Committee on Biophysics
University of California

Dear Professor Cook:

Below is an outline of the special course Physics X 101ABC entitled "Measurements of Radiation."

Scope of the Course

The course consisted of 15 hours of lectures and 60 hours of laboratory. The following was discussed in lecture:

- (a) The principles of radiation measuring devices, ionization chambers, counters, and associated electronic devices.
- (b) A description of the interaction of radiations with matter. This includes x-rays, gamma rays, beta rays, alpha rays and neutrons. The discussion was held at a fairly elementary level but sufficient information and data were given to enable the students to solve a wide variety of problems in radiation measurements and design adequate radiation shielding.
- (c) Methods of evaluation of data and their statistical treatment. Definition of important units used in radioactivity and detailed discussion of the problem of dosage measurements.

The laboratory part of the course consisted of 17 different experiments. These were selected to give illustrated examples of the interaction of radiations with matter and to teach the students the handling of measuring instruments, the preparation of samples for measurement, the interpretation of counting data and the observation of health safety precautions. One should mention here that the first six experiments given in this course were patterned somewhat after the experiments given in Physics 126 by Dr. Hamilton. These experiments are basic for any biological worker who intends to study radioactivity. I believe the last 13 experiments gave the students a somewhat more detailed insight of the problems of measurement radiations and of radioactive tracers than obtained in Physics 126. Dr.

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Professor S. F. Cook

September 11, 1948

Hamilton's course gives more detailed information on the handling of biological experiments in radioactive tracer work.

Lists of lectures and laboratory experiments are included in the attached folder.

Text Book

Korff: Electron and Nuclear Counters was selected as the text. This book, however, contained only about 1/3 of the material needed for the course (in much more detail than was necessary) and the students had to refer to their lecture notes and references. If this course is to be repeated, it would be highly desirable to prepare mimeographed lecture notes for the students. The laboratory experiments were prepared on mimeographed sheets, copies of which are enclosed.

Examinations and Grades

At the conclusion of the course a one-hour, closed book examination and a three-hour opened book examination were given. In addition the students were required to turn in reports on 17 experiments. The final grades were obtained by allotting 60% for the laboratory write ups and 40% for the final. Copies of the finals are attached. Another mimeographed sheet contains important definitions and some of the required material for the examination.

Performance of the Students

The entire group of Army and Navy men was very enthusiastic. They worked hard and conscientiously. The attendance was better than that for an average group of students and the reports were turned in with more regularity than usual.

I feel that the Physics background of the group left something to be desired. The students gave the appearance of being rather hastily prepared for this course and lacking basic mathematical and physical knowledge. In spite of this they did remarkably well in the laboratory and in the examinations. However, I believe that their deficiency in background might show up later and that they might forget the newly learned material faster than a younger, and more thoroughly trained group of students. This should not be taken as criticism against individuals in the class. There were three or four students who had definitely high ability and who showed fine performance. Grades for the individual experiments and the finals are shown in a table attached. There is less scattering of the grades than in an ordinary group of students because of the preselected nature of the group.

Equipment

The course was somewhat hastily prepared and there was little time for procurement of equipment and setting up of experiments in

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Professor S. F. Cook

September 11, 1948

advance. Consequently, many of the instruments had to be borrowed from the course, Physics 126, the Physics Department Storeroom, and the Donner Laboratory. The generosity of these departments is hereby acknowledged. A great deal of the instructors' time was spent in obtaining the necessary equipment for the classes. Enclosed is a list of the actual equipment used. The attached chart indicates whether the equipment was purchased on the Navy contract or borrowed elsewhere. In view of the difficulty in obtaining equipment, it is suggested that if the committee decides to have the course given again next year adequate steps should be taken to purchase the necessary equipment. If a larger number of students is to be admitted to the course, the amount of equipment would have to be increased. It may also be desirable to obtain additional new equipment each year, and design new experiment to keep the course up to date.

Instructors

It is a pleasure to acknowledge the help of Mr. William Siri and Mr. Leo Lipetz, graduate students, who have done an excellent job in helping with the preparation of the experiments and in conducting the course. In addition we had valuable help from Dr. Peter Yankwich, Miss Patricia Weymouth, and Mr. Rayburn Dunn.

Radiation Measurement Course for Civilian Students and Prerequisites

Several students from Eastern Universities requested admission to this year's course, including inquiries from Harvard University, Columbia, University of Virginia, and Brookhaven National Laboratory. In view of this, it may be desirable to offer a course similar to the Navy's course in the regular summer session to interested civilian students. It has been suggested that the course might be useful to graduate students specializing in radioactivity who desire to obtain biophysics degrees. The course could be given combined with the Navy course. If such a decision was taken by the committee, some consideration might be given to the prerequisites. If the students were required to take Physics 121 and 124 as prerequisites, the measurement course could be given on a more advanced level and the results would be more substantial.

Acknowledgements

I wish to thank Professor John H. Lawrence, Professor L. B. Loeb and Professor J. G. Hamilton for a number of discussions regarding the organization and subject matter of this course. Miss Irene Hofmeister of the University Extension Division has done a splendid job in arranging the course.

Very truly yours,

Cornelius A. Tobias

CAT:GG
cc Prof. R. T. Birge
Prof. J. H. Lawrence
Mr. R. A. San Souci

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