UNIVERSITY COLLEGE OF THE FRASER VALLEY

COURSE INFORMATION

DEPARTMENT: NATURAL SCIENCE **DATE:** June 1993

Physics 382	Modern Physics Laboratory	3
NAME & NUMBER OF COURSE	**DESCRIPTIVE TITLE**	**UCFV CREDIT**

CATALOGUE DESCRIPTION:

An eclectic laboratory course designed to give students a chance to perform many traditional and novel experiments. The students will be presented with a list of experiments spanning the many disciplines of physics: dynamics, optics, solid state physics, fluid dynamics, thermodynamics, electricity, magnetism, electronics, nuclear physics, etc. From this list, the students select seven experiments which they find interesting.

COURSE PREREQUISITES: Physics 221, Physics 222, Physics 252

COURSE COREQUISITES:

HOURS PER TERM FOR EACH STUDENT					
	Lecture		hrs	Student Directed Learning	hrs
	Laboratory	60	hrs	Other - specify:	
	Seminar		hrs	_____	hrs
	Field Experience		hrs	TOTAL	60 HRS

UCFV CREDIT TRANSFER	[x]	UCFV CREDIT NON-TRANSFER	[ ]	NON-CREDIT	[ ]

TRANSFER STATUS (Equivalent, Unassigned, Other Details)

UBC TBD

SFU TBD

UVIC TBD

Other

G. McGuire	J.D. TUNSTALL Ph.D.
COURSE DESIGNER	**DEAN OF ACADEMIC STUDIES**

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COURSES FOR WHICH THIS IS A PREREQUISITE:	RELATED COURSES

TEXTBOOKS, REFERENCES, MATERIALS **(List reading resources elsewhere)**

TEXTS:

Assorted Bibliography

OBJECTIVES:

General Objectives:

1. **To increase the students' appreciation that the test of all knowledge should be an experiment, and that experiments are the sole judge of the correctness of knowledge.**

2. **To provide the students with a chance to form and answer their questions experimentally.**

3. **To provide direct experience of the fundamental difference between science and other academic disciplines by demonstrating and providing experience with the way knowledge is gathered and maybe more importantly to know how you know what you know.**

Specific Objectives:

1. **To ensure the students have used the standard measuring devices found in most modern physics labs.**

2. **To provide opportunities for the students to measure and to check if the classroom theory is reproducible in the lab.**

3. **To provide an opportunity for students to try some simple research projects.**

4. **To increase the students' laboratory skills in an effort to make the students more employable.**

5. **To ensure the students understand the importance of being able to communicate their findings in a clear and consistent manner. To provide practice in this type of communication.**

METHODS:

1. **The student will be required to do seven (7) experiments from a suggested list of about eighteen (18). The suggested experiments will cover a wide cross section of the standard physics disciplines: mechanics, electricity, magnetism, optics, thermal, solid state physics, electronics, etc.**

2. **The students will work in pairs or individually.**

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STUDENT EVALUATION PROCEDURE:

1. **The majority of marks earned (75%) in this course will be derived from the accumulated grades assigned to the individual laboratory reports.**

2. **The students will be required to give a seminar in which they will discuss the theory and present their data. This seminar will be worth 25% of the final grade assigned. It is expected that the marks earned in this course will be higher than those earned in a normal classroom environment.**

EXPERIMENTS (Suggested)

1. **Determine the numerical value for the Gravitational constant G. (Cavendish apparatus)**
2. **Measuring the acceleration due to gravity. (Kater's Pendulum)**
3. **Millikan Oil Drop Experiment**
4. **Measuring the speed of light. (rotating mirrors)**
5. **Franck-Hertz Experiment**
6. **Photoelectric Effect**
7. **Plotting of Magnetic Fields (3D)**
8. **Ferromagnetism (Hysteresis)**
9. **Mechanical Equivalent of Heat**
10. **Angular Momentum (Advanced PSSC)**
11. **Viscous Flow through tubes**
12. **Doppler Effect**
13. **Impedance of Loudspeakers**
14. **Nuclear Magnetic Resonance**
15. **Index of Refraction of Air (Interferometer)**
16. **Zeeman Effect**
17. **Black Body Radiation**
18. **Individual Research Projects**