UNIVERSITY COLLEGE OF THE FRASER VALLEY

COURSE INFORMATION

DISCIPLINE/DEPARTMENT: PHYSICS

IMPLEMENTATION DATE: JUNE 20/94

PHYSICS 451

Advanced Quantum Mechanics

UCFV CREDITS: 3

CALENDAR DESCRIPTION: This course is a continuation from Physics 381, the intermediate quantum mechanics. Course is mostly application of quantum mechanics. Topics include one electron atoms, perturbation theory, variational method, Time dependent perturbation theory, spin, multi-electron atoms.

RATIONALE:

COURSE PREREQUISITES: Physics 351

COURSE COREQUISITES:

HOURS PER TERM
FOR EACH
STUDENT
Lecture
Laboratory
Seminar
Field Experience

Student Directed Learning

Other - specify:

TOTAL HRS 60

MAXIMUM ENROLMENT:

Transfer credit requested? Yes No

AUTHORIZATION SIGNATURES:

Course Designer(s): Tim Cooper

Chairperson: Art Last

Curriculum Committee

Department Head: Tim Cooper

Dean: Wayne Welsh, Ph.D.

PAC: Approval in Principle

PAC: Final Approval: December 7, 1994

(Date)

(Date)
SYNONYMOUS COURSES:

(a) replaces (course #)

(b) cannot take ______________ for further credit (course #)

SUPPLIES/MATERIALS:

TEXTBOOKS, REFERENCES, MATERIALS  (List reading resources elsewhere)

TEXTS:


REFERENCES:

Quantum Mechanics, A. Goswami. Wm. C. Brown.

OBJECTIVES:

To give the student a strong background in quantum mechanics as it applies to the real world. To show the use of approximate methods in physics.

METHODS:

Lecture, Demonstration, small group practice, Discussion, Audiovisual presentation, Use of models and charts.

STUDENT EVALUATION PROCEDURE:

Assignments 30%
Midterm 25%
Final 45%
COURSE CONTENT

1. Central Force Problem
2. One Electron Atoms
3. Approximation methods, perturbation theory, variational methods
4. Time dependent Perturbation theory
5. Spin, Pauli Spin Matrices
6. Spin and the H-atom
7. Multi-electron atoms, introduction
8. Multi-electron atoms, continued
9. Two electron atoms, Hartree and Hartree Fock theories