UNIVERSITY COLLEGE of the FRASER VALLEY

UPAC FORM #2 (Page 1)

COURSE IMPLEMENTATION DATE:	June 1994
COURSE REVISED IMPLEMENTATION DATE:	September 2006
COURSE TO BE REVIEWED:	November 2009
(Four years after UPAC final approval date)	(MONTH YEAR)

OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **Faculty of Science, Health & Human Services / Physics**

COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS
PHYS 451		**3**

Advanced Quantum Mechanics
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course is a continuation from Physics 351, intermediate quantum mechanics, and consists mainly of applications of quantum mechanics. Topics include one electron atoms, spin, perturbation theory, the variational method, time dependent perturbation theory, multi-electron atoms, and scattering.

PREREQUISITES: **PHYS 351**
COREQUISITES:

SYNONYMOUS COURSE(S)
(a) Replaces: **n/a** *(Course #)*
(b) Cannot take: **n/a** *(Course #)* for further credit.

SERVICE COURSE TO:
(Department/Program)
(Department/Program)

TOTAL HOURS PER TERM: **75**
STRUCTURE OF HOURS:

Lectures:	**75**	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field Experience:		Hrs
Student Directed Learning:		Hrs
Other (Specify):		Hrs

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE:
HOURS PER DAY:

MAXIMUM ENROLLMENT:	**24**	
EXPECTED FREQUENCY OF COURSE OFFERINGS:	**Once every two years**	
WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☐ No

AUTHORIZATION SIGNATURES:

Course Designer(s): Tim Cooper; revised Derek Harnett
Chairperson: Gillian Mimmack *(Curriculum Committee)*
Department Head: Norm Taylor
Dean: Jackie Snodgrass
UPAC Approval in Principle Date:
UPAC Final Approval Date: May 26, 2006

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

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.

To enable the student to solve various problems in each of the topic areas listed in the Calendar Description section.

METHODS:

Lecture, demonstration, small group practice, discussion, audiovisual presentation, use of models and charts, seminars and presentations.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR (Please check:) ☒ Yes ☐ No

METHODS OF OBTAINING PLAR:

Please see the Physics PLAR policy on the department's webpage

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

TEXTS:

Griffiths, D., Introduction to Quantum Mechanics

REFERENCES:

Michael A. Morrison, Thomas L. Estle and Neal F. Lane

Understanding More Quantum Physics. Prentice Hall

Liboff, R., Introductory Quantum Mechanics

Messiah, A., Quantum Mechanics (Vol. 1-2)

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Assignments	30%
Midterm	25%
Final	45%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

1. Time-independent perturbation theory and other approximation methods
2. Fine structure of hydrogen
3. Time-dependent perturbation theory
4. Scattering
5. Other applications