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

PHYS 451       3

COURSE NAME/NUMBER  FORMER COURSE NUMBER  UCFV CREDITS
Advanced Quantum Mechanics

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

SYNONYMOUS COURSE(S) (a) Replaces: n/a
(b) Cannot take: n/a

SERVICE COURSE TO:

TOTAL HOURS PER TERM: 75

STRUCTURE OF HOURS:
Lectures: 75 Hrs
Seminar:
Laboratory:
Field Experience:
Student Directed Learning:
Other (Specify):

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 ☒

AUTHORIZED SIGNATURES:
Course Designer(s): Tim Cooper; revised Derek Hamett
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