Please complete this form and attach a copy of the syllabus for new courses. Forward it as an email attachment to the Secretary of the Graduate Council. A printed copy of the form with signatures should be brought to the Graduate Council Meeting. Complete the Coordinator Form on page 2, if changes in this course will affect other units.

Please Indicate  
X NEW  __MODIFY__  ____DELETE____

Local Unit  
Physics and Astronomy  Graduate Council Approval Date

Course Abbreviation  
PHYS  Course Number  767

Full Course Title  
Quantum Mechanics II

Abbreviated Course Title  
QUANTUM MECHANICS II

Credit Hours  
3  Program Record  PHAE

Repeatable for Credit  
D = Yes, not within same term  Up to ___ hours
T = Yes, within the same term  Up to ___ hours
X N = Cannot be repeated for credit

Activity Code  
X Lecture (LEC)  Studio (STU)  Seminar (SEM)
       Lab (LAB)  Internship (INT)  Independent Study (IN)
       Recitation (RCT)  

Catalog Format  
3 : 3 : 0  Course Level  GF (500 - 600)  x  GA (700+)

Maximum Enrollment  
20  For New courses, 1st term offered  200670

Prerequisites or Corequisites  
Physics 632 or permission of instructor

Catalog Description (35 words or less). Please use catalog format and attach a copy of the syllabus for new courses.

This course deals with advanced topics in quantum mechanics, rotations, and angular momentum. 3D solutions to Schrodinger equations, symmetries, conservation laws, approximate methods and spin mechanics.

For MODIFIED or DELETED courses as appropriate:

Previous course abbreviation

Previous number

Description of Modification

APPROVAL SIGNATURES

Submitted by  
Rickee Mahoney  email  thanks@gmu.edu

Department / Program  

College Committee  

Graduate Council Representative  

Date  
10-18-05
Graduate Course Proposal

I. Course Designation: Quantum Mechanics II

II. Catalog description: (see PHYS732)

Course Designation: Physics 732 – Quantum Mechanics II
   a. Credit Hours: 3
   b. Prerequisites: Physics 332 or permission of the instructor
   c. Description: This course deals with advanced topics in quantum mechanics, rotations and angular momentum, 3D solutions to Schrödinger equations, symmetries, conservation laws, approximate methods and spin mechanics

III. Justification of the Proposal:
   a. Course objectives: For graduate students to master the physical principles in advanced quantum mechanics, thus giving them a firm foundation upon which to base their research in physics.
   b. Necessity or desirability of adding this course: Quantum Mechanics is one of the foundation courses in every graduate physics program throughout the country. This is the second course in a two-semester sequence covering the classical topics of Quantum Mechanics.
   c. Relationship of this course to any similar course: This course replaces the previous version of PHYS732. (see comments in Phys632 - This new two-semester sequence should be considered as a replacement for the old one-semester Physics 732).

IV. Department Recommendations:
   a. Department: Physics and Astronomy
   b. Date: 10/07/05 approved
   c. Possible Instructors: Professors Maria Dworzecika, Indu Satija, Robert Oerter,

V. Semester and Year for Planned Initial Offering: Spring Semester 2007

VI. Sample Student Syllabus:
   a. Course Designation: Physics 732 – Quantum Mechanics II
   b. Proposed Course Content (for a fourteen-week semester)
      1. Symmetries and Their Consequences
      2. Rotational Invariance and Angular Momentum
      3. The Hydrogen Atom
      4. Spin
      5. Addition of Angular Momenta
      6. Variational and WKB Methods
      7. Time-Independent Perturbation Theory
      8. Time-Dependent Perturbation Theory
      9. Scattering Theory
      10. The Dirac Equation
c. Reading and Reference Materials
Principles of Quantum Mechanics by Shankar (There are many books which will be usable for his course and the choice will dependent on instructor)

d. Grades will be determined by evaluation of midterm, final, and homework.