Course Approval Form

Action Requested:
- [x] Create new course
- [ ] Inactivate existing course
- [ ] Reinstate inactive course
- [ ] Modify existing course

Course Level:
- [x] Undergraduate
- [ ] Graduate

College/School:
- [x] COS

Department:
- PHYSICS & ASTRONOMY

Submitted by:
- PHILIP RUBIN

Ext:
- 3815

Email:
- prubin@gmu.edu

Subject Code:
- PHYS

Number:
- 403

Effective Term:
- [x] Fall
- [ ] Spring
- [ ] Year 2017
- [ ] Summer

Title:
- Quantum Mechanics II

Credits:
- [x] Fixed
- 3

Repeat Status:
- [x] Not Repeatable (NR)
- [ ] Repeatable within degree (RD)
- [ ] Repeatable within term (RT)

Grade Mode:
- [x] Regular (A, B, C, etc.)
- [ ] Satisfactory/No Credit
- [ ] Special (A, B, C, etc. +IP)

Schedule Type:
- [x] Lecture (LEC)
- [ ] Lab (LAB)
- [ ] Recitation (RCT)
- [ ] Internship (INT)

Prerequisite(s):
- PHYS 402

Corequisite(s):

Restrictions Enforced by System:
- Major, College, Degree, Program, etc. Include Code.

Fulfills Mason Core Req? (undergrad only):
- [ ] Currently fulfills requirement
- [ ] Submission in progress

Are there equivalent course(s)?
- [x] Yes
- [ ] No

Catalog Copy for NEW Courses Only

Description:
Additional topics in Quantum Mechanics: angular momentum, perturbation theory, scattering, and the Dirac Equation

Notes:

Indicate number of contact hours:
- Hours of Lecture or Seminar per week: 
- Hours of Lab or Studio: 

When Offered:
- [x] Fall
- [ ] Summer
- [x] Spring

Approval Signatures

Department Approval
Date
College/School Approval
Date

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name
Unit Approval Name
Unit Approver’s Signature
Date

For Graduate Courses Only

Graduate Council Member

Provost Office

Graduate Council Approval Date

For Registrar Office’s Use Only: Banner _____________________ Catalog _____________________ revised 10/16/14
FOR ALL COURSES (required)
Course Number and Title: PHYS 403 – Quantum Mechanics II

Date of Departmental Approval:

FOR NEW COURSES (required if creating a new course)
- Reason for the New Course: One course in quantum mechanics is insufficient for students hoping to do well on the Physics GRE and attend graduate school
- Relationship to Existing Programs: QM II will be an elective in the physics B.S., strongly recommended to those intending to apply to graduate school
- Relationship to Existing Courses: QM II will follow up on PHYS 402 – Introduction to Quantum Mechanics and Atomic Physics, the prerequisite
- Semester of Initial Offering: Fall 2017
- Proposed Instructors: Nikolic, Satyapal, Sauer, Tian, Zhao
- Insert Tentative Syllabus Below
Physics 403 – Quantum Mechanics II
Syllabus

Instructor: Phil Rubin
Office: PH 253
Phone: 703.993.3815
E-mail: prubin@gmu.edu
Office Hours: Monday and Wednesday 10:30-12:00

Prerequisite: PHYS 402 (strictly enforced)

Please note:

- All e-mail communication from the instructor concerning this course will be to GMU accounts only.
- If you are a student with a disability and require academic accommodations, please see me and contact the Office of Disability Resources at 703.993.2474. All academic accommodations must be arranged through that office.

Course Goals:
1. To complete coverage of basic quantum mechanics at the undergraduate level
2. To prepare students better for the Physics GRE
3. To prepare students for advanced courses in modern physics

Textbook:
- Introduction to Quantum Mechanics, 2nd edition, David J. Griffiths

Requirements:
- Homework: Weekly assignments due the first meeting of the week unless otherwise specified; 50% penalty for homework turned in one (1) day late; no assignment accepted more than one (1) day late; exceptions: an excuse communicated to, and accepted by the instructor, in advance or justified by an official document.
- Exams: Two (2) mid-term examinations and one (1) final examinations

Grading:
- Homework: 50%
- Midterms: 30%
- Final: 20%
Topics:
1. Spin and Angular Momentum
2. Addition of Angular Momenta
3. The Variational Principle
4. The WKB Approximation
5. Time-independent Perturbation Theory
6. Time-dependent Perturbation Theory
7. Scattering
8. The Dirac Equation

Honor Code Violations:
Science is impossible when dishonesty, in any manifestation, exists. It's the worst possible conduct a scientist can display. Dishonesty of any sort (cheating, plagiarism, lying, stealing) will be addressed in accordance with the GMU Honor Code.

Don't cheat. Don't even look like you're cheating.

The GMU Honor Code: [http://www.gmu.edu/catalog/9798/honorcod.html#code](http://www.gmu.edu/catalog/9798/honorcod.html#code)

GMU Diversity Statement: