

## PHYS 530B: QUANTUM MECHANICS II

SYLLABUS (2013 Fall)

*Department of Physics, Southern Illinois University–Carbondale*

Last updated: August 13, 2013

### 1 General information:

Instructor: K. V. Shajesh

Office: Neckers 476, Tel.: x35257. (If moved, it will be updated on course webpage.)

Class meetings: MTR 5:00-5:50 PM, in Neckers 410.

Email: kvshajesh@gmail.com (SIU email will be updated on course webpage.)

Office hours: WF 3:00-5:00 PM, or by appointment.

### 2 Prerequisites:

Completed PHYS 530A, which introduced the mathematical foundations of quantum mechanics, harmonics oscillator, angular momentum, and hydrogen atom. Familiarity with the following topics will be assumed: vector space, complex variables, partial differential equations.

### 3 Course description

#### References

1. *Principles of Quantum Mechanics*, by R. Shankar.
2. *Quantum Mechanics*, by E. Merzbacher. (Assigned textbook.)
3. *Quantum Mechanics: Symbolism of Atomic Measurements*, by J. Schwinger, edited by B.-G. Englert.
4. *Modern Quantum Mechanics*, by J. J. Sakurai.
5. *Quantum Mechanics*, by C. Cohen-Tannoudji, B. Diu, and F. Laloë.
6. *Introduction to Quantum Mechanics*, lecture notes of K. A. Milton, available at <http://www.nhn.ou.edu/milton/p3803-12.html> and <http://www.nhn.ou.edu/milton/p4803-12.html>.

We shall cover the following topics: angular momentum and Poincaré symmetries, Zeeman and Stark effect, perturbation theory, scattering theory, Dirac equation.

#### Webpage

Lecture notes and homework will be posted at <http://www.physics.siu.edu/~shajesh>.

### 4 Course work

#### Evaluation

Homework	30 %
Midterm Exams ( $2 \times 20$ %)	40 %
Final Exam	30 %

## Homework

Homework will be assigned roughly on a weekly basis at the course webpage. Students are encouraged to discuss homework problems with their classmates and anyone. But, each student should submit their own work describing detailed steps of thought process.

## Exams

Three examinations (including the final exam) will be administered.

Exam I	September 26 (Thursday)
Exam II	October 31 (Thursday)
Final Exam	December 9 (Monday) 5:50pm-7:50pm

## 5 Syllabus Attachment

The Provost Office has created a “Syllabus Attachment” to assist the student. It lists and provides web links for many elements that are important for a student. Kindly find it attached.

*"We emphasize student achievement and success because achievement and success are essential if we are to shape future leaders and transform lives"*

### IMPORTANT DATES

Last day to add a class (without instructor permission)..... 8/30/2013  
Last day to withdraw completely and receive a 100% refund.....9/01/2013  
Last day to drop a course using SalukiNet .....10/27/2013  
Last day to file diploma application (for name to appear in Fall Commencement program).....11/01/2013  
Final examinations .....12/9 – 12/13/2013

*Note: For outreach, internet, and short course drop/add dates, visit Registrar's Academic webpage <http://registrar.siu.edu/>*

### FALL SEMESTER HOLIDAYS

Labor Day 09/02/2013  
Fall Break 10/12—10/15/2013  
Thanksgiving Break 11/27—12/1/2013

### WITHDRAWAL POLICY ~ Undergraduate only

Students who officially register for a session may not withdraw merely by the stopping of attendance. An official withdrawal form needs to be initiated by the student and processed by the University. For the proper procedures to follow when dropping courses and when dropping from the University, please visit <http://registrar.siu.edu/pdf/ugradcatalog1314.pdf>

### INCOMPLETE POLICY~ Undergraduate only

An INC is assigned when, for reasons beyond their control, students engaged in passing work are unable to complete all class assignments. An INC must be changed to a completed grade within one semester following the term in which the course was taken, or *graduation*, whichever occurs first. Should the student fail to complete the course within the time period designated, that is, by no later than the end of the semester following the term in which the course was taken, or graduation, whichever occurs first, the incomplete will be converted to a grade of *F* and the grade will be computed in the student's grade point average. *For More information please visit <http://registrar.siu.edu/grades/incomplete.html>*

### REPEAT POLICY

An undergraduate student may, for the purpose of raising a grade, enroll in a course for credit no more than two times (two total enrollments) unless otherwise noted in the course description. For students receiving a letter grade of A,B,C,D, or F, the course repetition must occur at Southern Illinois University Carbondale. Only the most recent (last) grade will be calculated in the overall GPA and count toward hours earned. *See full policy at <http://registrar.siu.edu/pdf/ugradcatalog1314.pdf>*

### GRADUATE POLICIES

Graduate policies often vary from Undergraduate policies. To view the applicable policies for graduate students, please visit <http://gradschool.siu.edu/about-us/grad-catalog/index.html>

### DISABILITY POLICY

Disability Support Services provides the required academic and programmatic support services to students with permanent and temporary disabilities. DSS provides centralized coordination and referral services. To utilize DSS services, students must come to the disability office to open cases. The process involves interviews, reviews of student-supplied documentation, and completing Disability Accommodation Agreements. <http://www.siu.edu/dss>

### STUDENT CONDUCT CODE

[http://policies.siu.edu/other\\_policies/chapter3/conduct.html](http://policies.siu.edu/other_policies/chapter3/conduct.html)

### SALUKI CARES

The purpose of Saluki Cares is to develop, facilitate and coordinate a university-wide program of care and support for students in any type of distress—physical, emotional, financial, or personal. By working closely with faculty, staff, students and their families, SIU will continue to display a culture of care and demonstrate to our students and their families that they are an important part of the community. For Information on Saluki Cares: (618) 453-5714, or [siucares@siu.edu](mailto:siucares@siu.edu), <http://salukicare.siu.edu/index.html>

### EMERGENCY PROCEDURES

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. We ask that you become familiar with the **SIU Emergency Response Plan** and **Building Emergency Response Team (BERT)** program.

Emergency response information is available on posters in buildings on campus, available on BERT's website at [www.bert.siu.edu](http://www.bert.siu.edu), Department of Safety's website [www.dps.siu.edu](http://www.dps.siu.edu) (disaster drop down) and in Emergency Response Guideline pamphlet. Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. ***It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency.***

### INCLUSIVE EXCELLENCE

SIU contains people from all walks of life, from many different cultures and sub-cultures, and representing all strata of society, nationalities, ethnicities, lifestyles, and affiliations. Learning from and working with people who differ is an important part of education, as well an essential preparation for any career.

### MORRIS LIBRARY HOURS

<http://www.lib.siu.edu/about>

### LEARNING AND SUPPORT SERVICES

Help is within reach. Learning support services offers free tutoring on campus and math labs. To find more information please visit Center for Learning and Support Services website for:

**Tutoring** : <http://tutoring.siu.edu/>

**Math Labs** [http://tutoring.siu.edu/math\\_tutoring/index.html](http://tutoring.siu.edu/math_tutoring/index.html)

### WRITING CENTER

The Writing Center offers free tutoring services to all SIU students and faculty. To find a Center or Schedule an appointment please visit <http://write.siu.edu/>

### AFFIRMATIVE ACTION & EQUAL OPPORTUNITY

Our office's main focus is to ensure that the university complies with federal and state equity policies and handles reporting and Investigating of discrimination cases. *For more information visit <http://diversity.siu.edu/#>*

### **Additional Resources Available:**

**SALUKINET:** <https://salukinet.siu.edu/cp/home/displaylogin>

**ADVISEMENT:** <http://advisement.siu.edu/>

**PROVOST & VICE CHANCELLOR:** <http://pvcaa.siu.edu/>