

Physics 4251A

Course Information

September to December, 2011

General Course Information

- **Course title:** “Quantum Mechanics II.”
- **Lectures:** Tuesdays and Thursdays, 4:30 pm – 6:00 pm, P&AB Room 137
- **Tutorials:** intermixed with lectures.

Calendar Description: Quantum mechanical description of angular momentum; Stern-Gehrlach experiment and electron spin; addition of angular momenta; full separation of variables treatment of the hydrogen atom; Schrodinger equation; time independent non-degenerate and degenerate perturbation theory; fermions, antisymmetry, and the helium atom; time-dependent perturbation theory, Fermi golden rule, and radiative transitions, among other topics.

Antirequisites: - 4251A/B

Prerequisites: Physics 351A/B or 3200A/B.

3 hours of lectures per week, 0.5 course.

Note: Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Instructor Information

- **Full name & title:** Professor Wayne K. Hocking, Physics & Astronomy Dept., UWO
- **Office location:** Physics & Astronomy Bldg., Rm. 301
- **Office phone number:** 661-2111 ext. 83658
- **Office hours:** by prior appointment
- **Email address:** whocking AT uwo DOT ca

Teaching Assistant

- **Name:** Eric Barbagiovanni
- **Office location:** TBA
- **Office phone number:** TBA
- **Email address:** ebarbagi AT uwo DOT ca

Texts, Readings, Materials

Textbook:

“Quantum Mechanics”, 2nd ed., by B.H. Bransden and C.J. Joachain, Publ Pearson/Prentice-Hall.

ISBN-10: 0-582-35691-1
ISBN-13: 978-0-582-35691-7

The text book is not mandatory. Most of the content of the course can be found on the webCT website as pdf files. Notes will be updated prior to each lecture when required.

Website: WebCT <http://webct.uwo.ca> (password required)

EVALUATION:

Description of examinations

- One 2-hour midterm in mid to late October (time to be announced)
- A final exam in December

[Exam times will be posted on the course web site when available. Students needing to make travel arrangements are advised to book travel dates outside of the examination period. *No makeup exams will be given to accommodate travel.*]

Assignments – approximately 3 to be given, distributed uniformly throughout the term. Dates to be announced.

Mark distribution

- Problem assignments: 25%
- Midterm test: 25%
- Final exam: 50%

Please note: final course marks may need to be adjusted in order to conform to department policy.

Course Policies

- Attendance at lectures is optional, but highly recommended.
- Missed assignments: There is in general no grace period, except under special circumstances that must be approved by the instructor.
- Missed midterm test: Documentation must be provided to the instructor in order for you to receive permission to write a make-up.
 - If you miss the make-up for a valid reason, again documentation must be provided, and your mark will be pro-rated.
- Missed final exam: Documentation must be provided to the academic counselors in your faculty in order for you to receive permission to write a make-up (usually scheduled

for late December of early January (to be announced) – plan your travel accordingly!). If you miss the make-up for a valid reason, again documentation must be provided, and you will then write the exam at the next sitting of this course's final exam (typically one year later).

Accommodations for Religious Holidays

When scheduling unavoidably conflicts with religious holidays which a) require an absence from the University or b) prohibit or require certain activities (i.e., activities that would make it impossible for the student to satisfy the academic requirements scheduled on the day(s) involved), no student will be penalized for absence because of religious reasons, and alternative means will be sought for satisfying the academic requirements involved. If a suitable arrangement cannot be worked out between the student and instructor involved, they should consult the appropriate department chair and, if necessary, the student's Dean.

It is the responsibility of such students to inform themselves concerning the work done in classes from which they are absent and to take appropriate action.

A student who, for either of the situations outlined in paragraph one above (a or b), is unable to write examinations and term tests on a Sabbath or Holy Day in a particular term shall give notice of this fact in writing to his or her Dean as early as possible, but not later than November 15 for mid-year examinations and March 1 for final examinations, i.e., approximately two weeks after the posting of the mid-year and final examination schedule respectively. In the case of mid-term tests, such notification is to be given in writing to the instructor within 48 hours of the announcement of the date of the mid-term test. If a Special Examination is offered as an alternative means to satisfy the academic requirements, the instructor(s) in the case of mid-term tests and the dean in the case of mid-year and Spring final examinations will arrange for special examination(s) to be written at another time. In the case of mid-year and Spring final examinations, the accommodation must occur no later than one month after the end of the examination period involved. It is mandatory that students seeking accommodations under this policy give notification before the deadlines and that the Faculty accommodate these requests.

For purposes of this policy the University has approved a list of dates which are recognized religious holidays which require members of those religions to be absent from the University; this list is updated annually and is available at Departmental, Deans' and Faculty advising offices.

Make-up Policy

The following applies to all medical excuses involving work worth >10%.

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see:

http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility, or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here:

https://studentservices.uwo.ca/secure/medical_document.pdf

Final Examination

In accordance with Senate Policy, a Special Examination will be held within thirty days of the regular final examination for students who are unable to write the regular examination for medical or other documented reasons. Requests for such a Special Examination must be made to the Associate Dean, Faculty of Science.

Note that if you fail to write a scheduled Special Examination, permission to write another Special Examination will be granted only with the permission of the Dean in exceptional circumstances and with appropriate supporting documents. In such a case, the date of this Special Examination normally will be the scheduled date for the final exam the next time the course is offered.

Accessibility

Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Scholastic Offenses

Scholastic offenses are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offense, at the following Web site:

http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf

Cheating

Cheating refers, among other things, to access to exam and assignment solutions by illicit means, including theft from other students, copying from other students, illegal access to instructor notes, inappropriate extraction from the world-wide-web, and illegal coercion of teaching assistants and other staff. The definition of cheating is not restricted to these examples, and may be interpreted more broadly at the instructor's discretion. If two assignments are handed up that are identical, or close to identical, both will be given zero mark. Assignment answers should be distinctively individual.

Plagiarism

Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or

citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

Classroom Conduct

Disruptive behaviour will not be tolerated in class. Please respect the rights of your classmates to benefit from the lecture by limiting your conversations to those essential to the class. Students who persist in loud or rude behaviour will be asked to leave.

Complaints and Suggestions

If you have a concern about something, please let us know. We rely on your feedback. Please contact initially the person most directly concerned; this will usually be your instructor. If that is not satisfactory, or if there is something more general bothering you, talk it over with the Physics & Astronomy Department Chair or the Associate Chair of Undergraduate Studies (for contact information see <http://www.physics.uwo.ca>).

Contacting the Instructor

The instructor will generally be available for quick discussions immediately after each lecture. For longer interactions, please make an appointment. This can be set up after a lecture, or via e-mail. The simplest way to contact him outside of lectures is via your UWO e-mail account. Please allow 2–3 working days for a response.

*We will not **read or respond** to emails from addresses that do not end in “@uwo.ca”.*

Other advice for successful performance:

You must work out the problem assignments to succeed in this course. Merely attending lecture and reading the textbook will not do it! If you encounter difficulties in doing the problems, ask your TAs or me for help. Copying assignments of others is likely to be to your own detriment. By all means work with others on assignments if you want to, but if you simply copy the answers, and do not understand what you have written, it will undoubtedly disadvantage you when exams come around. Be sure to use your own words when writing assignments. Remember- if two assignments are handed up that are identical, or close to identical, both will be given zero mark. Assignments should be distinctively individual.