

PHYS 215: Introductory Quantum Physics

May-June 2017

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Lectures: 14:30 - 15:50, Mondays, Tuesdays and Thursdays in CLE A118
First lecture: Monday 8 May 2017.

Course web: <http://coursespaces.uvic.ca>

Text: *Modern Physics for Scientists and Engineers*, 4th edition, S.T. Thornton and A. Rex. Any other edition is also acceptable, but there are a few differences between the texts.
One copy of the 4th edition text is on the Library Reserve, with call number "pri 16670".

Labs: All lab sections are held in the Elliott Lab wing room 139.
You must attend the first lab on 10 May.
Obtain your lab manual and lab notebook at the bookstore.
If you have any questions regarding the labs:
Dr. Alex van Netten, vannette@uvic.ca
Mr. Rob Rempel, drempel@uvic.ca

Office Hours: In Elliott 205A: Mondays 12:30 to 14:15. You can also email lefebvre@uvic.ca to make an appointment.

Course material

Course material will be distributed via the University's <http://coursespaces.uvic.ca> web site. This includes any slides shown in class, a detailed probable schedule of lectures and associated readings, and notes pointing to other useful resources.

Topics covered

The course covers the experimental basis of quantum mechanics, the atomic structure and wave properties of matter, the time-independent Schrödinger equation, wave functions and probability, and if time allows an introduction to the Hydrogen atom. The topics covered correspond to chapter 1, a brief review of relativistic energy and momentum from chapter 2, chapters 3, 4, 5, 6, and if time allows part of chapter 7.

Required courses

Prerequisites: PHYS 110 and 111; or PHYS 120 and 130
Pre- or co-requisites: MATH 204

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Keys to success

- Attend lectures and labs.
- Read the text.
- Do assignments and lab reports.
- Study.

Calculator

You may only use a non-programmable, non-graphing calculator for exams. Examples of acceptable calculators are the Sharp EL-510R or EL-510RNB; they can be bought in the UVic Bookstore for about \$10.

Marking and Grades

To obtain credit in the course you must:

- complete all labs and have satisfactory standing in the labs;
- have at least 50% on your final mark, which is obtained from the following marking scheme:

| | | |
|--------------|-----|--|
| Assignments | 15% | approximately 7 assignments |
| Labs | 20% | all labs must be completed |
| Midterm exam | 20% | 50 min exam, 5 Jun in class |
| Final exam | 45% | 3 hour exam, 10-14 July, to be decided |

Assignments will typically be due one week after the issue date. Late assignments are not accepted.

You cannot pass the course without passing the labs; this is a department regulation and it cannot be waived. If you do not pass the labs, your overall percentage grade will be at most 49%.

The final grade follows the Senate-approved percentage grading scheme for conversion of numerical scores to letter grades:

| | | | |
|-----------|----------|----------|----------------|
| A+ 90-100 | B+ 77-79 | C+ 65-69 | E 40-49* |
| A 85-89 | B 73-76 | C 60-64 | F 0-49 |
| A- 80-84 | B- 70-72 | D 50-59 | N Not Complete |

If the application of this scheme would result in grades that are judged by the instructor to be inconsistent with the [University's grading descriptions](#), then the instructor will assign percentages consistent with them. The grade N is a failing grade that indicates that you did not complete the required course work.

*If you pass the labs and if your final percentage grade is equal to or greater than 40% and less than 50%, you will be assigned an E, with the possibility of a supplemental exam, if you are eligible.

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Arrangements and Conduct

The instructor is willing to arrange reasonable accommodations for:

- missed exams or course deadlines due to illness or other affliction;
- conflicts between classes or examinations, and religious observances;
- similar issues.

If you anticipate missing a course requirement, you are expected to contact the instructor a reasonable amount of time in advance.

Cheating, plagiarism, and other forms of academic fraud are taken very seriously by the University and by the instructor. Please familiarize yourself with the [Policy on Academic Integrity](#) which can be found in the Undergraduate Calendar.

Tentative Lecture Schedule (last update 11 June 2017)

| <u>Date</u> | <u>Lecture Title</u> | <u>Text Reference</u> |
|-------------|---|-----------------------|
| May 8 | The Birth of Modern Physics | 1. |
| May 9 | Review of Relativistic Kinematics | 2.1, 2.3-6, 2.11-13 |
| May 11 | The Experimental Basis of Quantum Theory | 3. |
| May 15 | The Experimental Basis of Quantum Theory | 3. |
| May 16 | The Experimental Basis of Quantum Theory | 3. |
| May 18 | The Experimental Basis of Quantum Theory | 3. |
| May 23 | Structure of the Atom | 4. |
| May 25 | Structure of the Atom | 4. |
| May 29 | Structure of the Atom | 4. |
| May 30 | Structure of the Atom | 4. |
| Jun 1 | Wave Properties of Matter and Quantum Mechanics I | 5. |
| Jun 5 | MIDTERM EXAM in class | |
| Jun 6 | Wave Properties of Matter and Quantum Mechanics I | 5. |
| Jun 8 | Wave Properties of Matter and Quantum Mechanics I | 5. |
| Jun 12 | Wave Properties of Matter and Quantum Mechanics I | 5. |
| Jun 13 | Quantum Mechanics II | 6. |
| Jun 15 | Quantum Mechanics II | 6. |
| Jun 19 | Quantum Mechanics II | 6. |
| Jun 20 | Quantum Mechanics II | 6. |
| Jun 22 | Quantum Mechanics II | 6. |
| Jun 26 | The Hydrogen Atom | 7. |
| Jun 27 | The Hydrogen Atom | 7. |
| Jun 29 | The Hydrogen Atom | 7. |