Carleton University

BIT 1003A – Physics for Information Technology II (Winter 2018)

Course Outline

Electrostatics, electric field and potential. Capacitors, inductors. Study of DC and AC Circuits. Introduction to semiconductors. Practical skills are learned in the laboratory, which is a required part of the course. Prerequisite: BIT 1002.

Instructor: Prof. Heather Logan (`logan@physics.carleton.ca`, 613-520-2600 x4319, 3324 Herzberg)

Laboratory supervisor: Tamara Rozina (`tamara.rozina@carleton.ca`)

Required Textbook: *Physics: Principles with Applications (7th edition)*, Douglas C. Giancoli, Pearson/Prentice Hall, 2014 (the same book was used for BIT 1002 in Fall 2017).

Lectures: Mondays and Wednesdays, 8:35–9:55 a.m., in Azrieli Pavilion 132

Labs and tutorials: Fridays, 8:35–11:25 a.m., in Herzberg 4160 (see below)

Office hours: Mondays and Wednesdays, 3:00–4:00 p.m., in 3324 Herzberg, or by appointment. You are also welcome to use the Physics Drop-in Centre in 3349 Herzberg, which is staffed 5 days a week around the middle of the day.

Course content and reading:

1. Electrostatics (Jan 8, 10): Chapter 16, "Electric Charge and Electric Field"
2. Electric energy (Jan 15, 17, 22): Chapter 17, "Electric Potential"
3. Electric current (Jan 24, 29, 31): Chapter 18, "Electric Currents"
4. DC circuits (Feb 5, 7): Chapter 19, "DC Circuits"
5. Magnetism (Feb 12, 14): Chapter 20, "Magnetism"
6. AC circuits (Feb 26, 28, Mar 5, 7): Chapter 21, "Electromagnetic Induction and Faraday's Law"
7. Quantum mechanics (Mar 12, 14): Chapter 27, "Early Quantum Theory and Models of the Atom"
8. Atomic models (Mar 19, 21): Chapter 28, "Quantum Mechanics of Atoms"
9. Solid state physics (Mar 26, 28, Apr 2, 4): Chapter 29, "Molecules and Solids"
10. Review for final exam (Apr 9)

Assignments, Tests, Laboratories, and Grading Scheme:

Tutorial tests (30%)

Tutorials with tests will be held every second week (alternating with the labs). Students will receive, through CULearn, 6 problems as an assignment a week before each tutorial session. Students are advised to complete this assignment before the tutorial. The first two hours of the tutorial will be spent going over the problems and answering any questions you have about them. The last hour of the tutorial will consist of a brief test composed of 2 problems on similar topics and of a similar difficulty as the assignment problems. You are encouraged to discuss the problems given in the assignments with other students in the course. However, when you work the test you must work it by yourself. Working out the assignments and attending the tutorials is the best way to learn the course material.

The 5 tutorials will be held on Jan 19, Feb 2, Feb 16, Mar 9, and Mar 23. The 6th tutorial session, on Apr 6, will be a review session for the final exam.

Laboratory write-ups (35%)

Laboratory sessions will be held every second week (alternating with the tutorials). The labs provide direct hands-on experience of the concepts that we will be learning in class. Please refer to the lab schedule on the next page.

Final examination (35%)

The final exam will be 3 hours long and will be scheduled during the final examination period in April. The final exam will be **closed book and closed notes**. A formula sheet will be provided.

In the event that a deferred exam is necessary for a student, that exam will replace only the final exam component of the course mark and will be granted only if adequate term work has been completed (such that it is mathematically possible to pass the course). Inadequate term work constitutes earning less than 15 of the 65 possible term marks.

Lab Schedule

BIT 1003 W18

The first lab will take place on **January 12, 2018**.

All the experiments and tutorials/tests will be held in **HP 4160**.

It is imperative that all students attend the first lab. All changes (exemptions, etc.) must be arranged with Ms. Rozina at the start of term. If you have a documented reason for missing a laboratory session, you must contact Ms. Rozina **immediately**. A make-up session may be arranged at the end of term in these cases. If you do not have documentation, you will not be permitted to take a makeup session, and you will receive a lab mark of zero for that experiment.

All experiment write-ups must be handed in at the end of the lab session. No late submissions will be accepted.

All write-ups count towards your total lab grade for the course. **No lab grade will get dropped.**

Lab Schedule

Lab #	Title	Weight (%)	Date
1	DC Circuits	20	January 12, 2018
2	Oscilloscope	20	January 26, 2018
3	Kirchhoff's Rules	20	February 9, 2018
4	Photoelectric Effect	20	March 2, 2018
5	RC Time Constant	20	March 16, 2018

Important University regulations:

For Carleton University policies regarding academic integrity and privacy, please read `http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/` section E ("Student Conduct") and `http://carleton.ca/privacy/policies/`.

It is your responsibility to read and be familiar with these policies.

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy or religious obligations: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: `http://carleton.ca/equity/accommodation`.

Academic accommodations for students with disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with learning disabilities, psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), autism spectrum disorders, chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or `pmc@carleton.ca` for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, **you must meet with me** to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Policy regarding missed term work: If you miss an assignment or the midterm exam for unforeseen medical reasons, you must contact me with documentation within three (3) working days of your return to normal capabilities in order for accommodations and/or a deferred midterm exam to be arranged. The midterm exam can only be replaced by a deferred midterm and will not be waived. Retroactive accommodations will not be granted.