

Circuit Theory and Introductory Electronics

Instructor:

Werner Ens
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email: w.ens@umanitoba.ca (please put 2610 in the subject line)
Consultation: after classes, or by appointment

Web site: www2.physics.umanitoba.ca/u/ens/phys2610

Text:

- *Fundamentals of Physics*, Halliday, Resnick & Walker, 9th Edition, Wiley (2011)
- *Eggleston, Basic Electronics for Scientists and Engineers*

Other Resources:

- *Introduction to Electronics* (http://en.wikipedia.org/wiki/Book:An_introduction_to_electronics)
- *Phys 2610 Laboratory descriptions on course web site*
- *Brophy, Basic Electronics for Scientists*
- *Simpson, Introductory Electronics*
- *Supplementary notes and additional references will be posted on the course web site*

Lectures: Tues & Thu, 1:00 – 2:15, 519 Allen

Lab/Tutorial: Mondays 2:30 – 5:15, 519 Allen

There will be activity each week, beginning Jan 14. Missed labs should be made up by special arrangement.

For each experiment, a lab report should be submitted for marking by the following Monday. Bring a lab notebook, calculator, pencil, and ruler. Introductory material and experiment descriptions for 10 experiments are posted on the course web site, but they are subject to change before the experiments are performed.

Some labs require pre-lab exercises, to be handed in at the beginning of the lab period.

Assignments: There will be 6 homework assignments.

Mid-term Examination: A mid-term exam will be held in March in the lab slot.

Final Examination: A 3-hour final exam will be written during the April examination period, scheduled by Student Records.

Evaluation:

Assignments	15%
Lab	25%
Midterm	15%
Final	45%

There are no fixed grade boundaries but as a guideline, they are unlikely to be higher than 90 (A+), 80 (A), 75 (B+), 70 (B), 65 (C+), 60 (C), 50 (D)

Course Outline:

1. Current, Resistance, and Ohm's Law
2. AC circuits
3. Band theory and diode circuits
4. Bipolar junction transistors
5. Operational Amplifiers
6. Introduction to digital circuits

Laboratory Experiments (subject to change):

1. Kirchhoff's laws
2. RC circuits – transient response
3. RC circuits – ac response
4. RLC circuits
5. Diode circuits
- 6 & 7. Amplifier circuits
8. Op amps
9. TTL circuits: gates

Fine Print:

Using Copyrighted Material

Please respect copyright. We may on occasion use copyrighted content in this course. Content used in the course will be appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by the instructors, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the Copyright Act applies or written permission has been confirmed. For more information, see the University's Copyright Office website at <http://umanitoba.ca/copyright/> or contact um_copyright@umanitoba.ca.

Course Technology

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by the instructors and/or the University of Manitoba Student Accessibility Services. Students should not participate in personal direct electronic messaging or posting of activities (e.g. email, texting, video or voice chat, wikis, blogs, social networking, or online and offline gaming) during scheduled class time.

Cellular telephones and other wireless devices will be turned off during the lecture and formal (i.e. prescribed herein) laboratory times. If there is a pressing need for you to be contactable during the lecture (e.g. a family member is in the hospital or similar situation), make arrangements with the instructors.

You are encouraged to use all available resources, including electronic journal resources, paper-based journal articles, electronic and paper-based databases, and books available at and through the Science and Technology Library, in addition to any web-based resources (accessible via searches using a respectable search engine). You will be introduced to many of these resources during the information literacy session.

Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit:

http://umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2014_06_05.pdf

Please note that all communication between instructors and students must comply with the electronic communication with student policy:

http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html

Students are required to obtain and use a UofM email account for all communication with the university. In brief, email communications to instructors about this course must originate from a University of Manitoba email account (e.g. an address with @myumanitoba.ca) and have PHYS 3430 in the 'subject line'. Every effort will be made to reply to email concerning this course within 24 - 48 hours of receipt.

Academic Integrity

In addition to the general information about academic integrity and student discipline that are provided in Schedule A: Policies and Resources, specific course requirements for individual work and group work, include:

1. Group projects are subject to the rules of academic dishonesty.
2. Group members must ensure that a group project adheres to the principles of academic integrity.
3. Students are encouraged to collaborate and problem-solve on assignments, reports, and especially on the successful realization and implementation of experiments. However, students are responsible for a full and complete understanding of how the experiment was performed, and how the data was collected and analyzed.
4. All work is to be completed independently unless otherwise specified.

Student Accessibility Services

Students with a disability should contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who may have a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services (SAS):

<http://umanitoba.ca/student/saa/accessibility>

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