Western University
Faculty of Engineering
Department of Electrical and Computer Engineering

ECE 3337a/b: Electronic Circuits
Course Outline 2021-2022

Description: The objective of this course is to provide students with an understanding of certain fundamental analog electronic circuits that will allow them to analyze and design such circuits. The circuits studied in this course are the key building blocks for more sophisticated architectures. These later will be studied in following ECE courses.

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Consultation hours will be communicated to students later.

Academic Calendar Copy: Frequency response in electronic circuits, power amplifiers, differential amplifiers, feedback circuits, miscellaneous topics (Miller effect, current mirrors, cascade and cascode circuits, etc.).

Contact Hours: 3 lecture hours/week, 1.5 laboratory hours/week, 1 tutorial hour/week, 0.5 course.

Antirequisite: The former ECE 2235b

Prerequisites: ECE 2205a/b, ECE 2231a/b, ECE 2233a/b.
Unless you have either the requisites for this course or a written special permission from your Dean to enroll in it, you will 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 prerequisites.

CEAB Academic Units: Engineering Science 100%

Textbook: Course material will be referencing two books

1) Microelectronic Circuits by Sedra/Smith, preferably but not necessarily the 7th Edition, Oxford University Press, ISBN:978-0-19-933913-6.

2) Electronic Devices and Circuit Theory by R.L. Boylestad and L. Nashelsky, 11th Edition, Prentice-Hall, ISBN: 0-132-622262.

These two references will be supplemented with additional lecture material, lab material and material given to students.

General Learning Objectives (CEAB Graduate Attributes)

Knowledge Base	3/2	Use of Engineering Tools	3/2	Impact on Society and the Environment	
Problem Analysis	3/2	Individual and Team Work		Ethics and Equity	
Investigation	3/2	Communication Skills	3/2	Economics and Project Management	
Design		Professionalism		Life-Long Learning	

Notation: *x*/*y*, where *x* is the cognitive level (1: Remember, 2: Understand, 3: Apply) at which the attribute is assessed and *y* is the academic level (1: Beginner, 2: Intermediate, 3: Advanced) at which the attribute is assessed.

Topics and Specific Learning Objectives	**CEAB Graduate Attributes Indicators**
1. Frequency response in electronic circuits: At the end of this section, students will be able to achieve an understanding of frequency response in electronic circuits and calculate the upper and lower 3dB frequencies	KB3
2. Power amplifiers: At the end of this section, students will be able to understand, analyze and design power amplifier circuits.	KB3, PA2, PA3
3. Differential amplifiers: At the end of this section, students will be able to understand, analyze and design differential amplifiers.	KB3, PA2, PA3
4. Multi-stage amplifiers: At the end of this section, students will be able to understand, analyze and multiple cascaded amplifiers.	KB3, PA2, PA3
5. Feedback circuits: At the end of this section, students will be able to understand concepts related to feedback in electronic circuits	KB3, PA2, PA3
6. Miscellaneous topics: Current Sources, Current Mirrors and Current Steering Circuits. At the end of this section, students will be able to understand, analyze and design basic current sources, current mirrors and current steering circuits	KB3, PA2, PA3
7. Labs	I2, I3, ET2, CS1, CS3

Evaluation: The final course grade will be determined from a student's performance in labs, a mid-term examination, and a final examination. The mid-term test and the final examination are limited open book. The weighting of each of these components is as follows:

Course Component	**Weight**
Laboratory	15.0%
Midterm Test	30.0%
Final Examination	55.0%

To obtain a passing grade in the course, a student must obtain a minimum of 50% for the lab component of the course **AND** a minimum of 50% for the final examination. A mark < 50% in either the lab component or final examination will result in a final course grade of 48% or less.

Homework Assignments: Students are given a list of exercises at the end of every section. Theirs solutions will be posted shortly after. These exercises need not be returned and will not get marked.

Quizzes: Not applicable.

Laboratory: There will be 4 scheduled labs for the course. For each lab, students are expected to submit a lab report that will be due one week after completion of the lab, unless the instructor states that the due is extended. Note that material related to the labs may be part of any exam and students are responsible for this material regardless of lab attendance.

Late Submission Policy: The maximum penalty for an unauthorized late submission of a lab report will be 15% per day of the maximum obtainable mark. Lab reports that are more than 5 days late will not be accepted.

Midterm Test: TBA

The date and time of the midterm exam will be communicated to students later. Any change in the mid-term examination will be announced at least three days prior to the revised examination unless stated otherwise in class.

Final Examination: The final examination will take place during the regular examination period.

Lab report submission: Lab reports are to be submitted online.

Use of English: In accordance with Senate and Faculty Policy, students may be penalized up to 10% of the marks on all assignments, tests, and examinations for improper use of English. Additionally, poorly written work with the exception of the final examination may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.

Attendance: Any student who, in the opinion of the instructor, is absent too frequently from class, laboratory, or tutorial periods will be reported to the Dean (after due warning has been given). On the recommendation of the department, and with the permission of the Dean, the student will be debarred from taking the regular final examination in the course.

Absence Due to Illness or Other Circumstances: Students should immediately consult with the instructor or department Chair if they have any problems that could affect their performance in the course. Where appropriate, the problems should be documented (see the attached "Instructions for Students Unable to Write Tests or Examinations or Submit Assignments as Scheduled"). The student should seek advice from the instructor or department Chair regarding how best to deal with the problem. Failure to notify the instructor or department Chair immediately (or as soon as possible thereafter) will have a negative effect on any appeal.

For more information concerning medical accommodations, see the relevant section of the Academic Handbook:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf

For more information concerning accommodations for religious holidays, see the relevant section of the Academic Handbook:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Missed Midterm Examinations: If a student misses a midterm examination, the exam will not be rescheduled. The student must follow the Instructions for Students Unable to Write Tests and provide documentation to their department within 24 hours of the missed test. The department will decide whether to allow the reweighting of the test, where reweighting means the marks normally allotted for the midterm will be added to the final exam. If no reasonable justification for missing the test can be found, then the student will receive a mark of zero for the test.

If a student is going to miss the midterm examination for religious reasons, they must inform the instructor in writing within 48 hours of the announcement of the exam date or they will be required to write the exam.

Cheating and 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. University policy states that cheating, including plagiarism, is a scholastic offence. The commission of a scholastic offence is attended by academic penalties, which might include expulsion from the program. If you are caught cheating, there will be no second warning.

All required papers may be subject to submission for textual similarity review to commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents on the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (http://www.turnitin.com).

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, in the relevant section of the Academic Handbook:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Use of Electronic Devices:

Use of Personal Response Devices ("Clickers"):

Policy on Repeating All Components of a Course: Students who are required to repeat an Engineering course must repeat all components of the course. No special permissions will be granted enabling a student to retain laboratory, assignment, or test marks from previous years. Previously completed assignments and laboratories cannot be resubmitted by the student for grading in subsequent years.

Internet and Electronic Mail: Students are responsible for regularly checking their Western e-mail and the course web site (https://owl.uwo.ca/portal/) and making themselves aware of any information that is posted about the course.

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 519-661-2111 ext. 82147 for any specific question regarding an accommodation.

Support Services:
Office of the Registrar, http://www.registrar.uwo.ca/
Student Development Centre, http://www.sdc.uwo.ca/
Engineering Undergraduate Services, http://www.eng.uwo.ca/undergraduate/
USC Student Support Services, http://westernusc.ca/services/

Students who are in emotional/mental distress should refer to Mental Health @ Western, http://www.health.uwo.ca/mental_health/, for a complete list of options about how to obtain help.