COURSE OUTLINE
FALL 2023

	Date	Initials
Prepared by Instructor	24-Aug	AH
Approved by Head	08-Sep	amk

1. Calendar Information

ENEL 469
Analog Electronic Circuits

Review of semiconductor diodes, rectifiers and clamping. BJTs, small signal models, one stage topologies, frequency response and differential pairs. Circuit blocks.

Course Hours: 3 units; H(3-1.5T-3/2)
Academic Credit: 3
Calendar Reference: http://www.ucalgary.ca/pubs/calendar/current/electrical-engineering.html#7622

2. Learning Outcomes

At the end of this course, you will be able to:

1 Design BJT biasing circuits for single stage and multistage amplifiers
2 Analyze various current minor circuits and current steering circuits
3 Explain the operation of a differential circuit with active loads
4 Analyze various power amplifiers
5 Explain each block of practical operational amplifier circuits
6 Design practical analog electronic circuits

3. Timetable

Section	Day(s) of the Week	Time	Location
L01	MWF	11:00 am - 11:50 am	ICT122
T01	M	12:00 pm - 12:50 pm	ICT122
B01 and B02	Tr	2:00 pm - 4:50 pm	ENG 105

4. Course Instructors

Course Coordinator

Section	First Name	Family Name	Phone	Office	Email
	Anis	Haque	403-220-8606	ICT307	sahaque@ucalgary.ca

Other Instructors

Section	First Name	Family Name	Phone	Office	Email

Teaching Assistants

Section	First Name	Family Name	Phone	Office	Email

5. Assessments

There will be four (4) in-person quizzes and one (1) midterm exam, which will be conducted in ICT122. There is no final exam in this course.

All quizzes and midterm will be closed-book. Students are not permitted to search the internet, communicate with classmates or other individuals, or share examinations with classmates or other individuals during the assessment period.

Students missing a quiz or the midterm without appropriate approval (Calendar M.1) from the instructor will receive an automatic zero for the missing element. For a missing quiz or midterm with appropriate approval, the student will receive the average point obtained in rest of the quizzes and in the midterm if applicable. No deferred quiz or midterm will be offered.

- can try getting extra marks from quizzes

Quiz # 1 (10%) will take place during the lecture, tutorial, and/or lab time
Schedule: Sep 25, from 11:00 am to 12:50 pm (may change).

Quiz # 2 (10%) will take place during the lecture, tutorial, and/or lab time
Schedule: Oct 16, from 11:00 am to 12:50 pm (may change).

* even if I do get 100% I will keep my BT so what's the point

Quiz # 3 (10%) will take place during the lecture, tutorial, and/or lab time
Schedule: Oct 30, from 11:00 am to 12:50 pm (may change).

Quiz # 4 (10%) will take place during the lecture, tutorial, and/or lab time
Schedule: Nov 20, from 11:00 am to 12:50 pm (may change).

if no midterm
26.47 : 40
33.0875 : 50
will end up with 82.2775 placing me in BT

Midterm (10%) will take place during the lecture, tutorial, and/or lab time
Schedule: Dec 04, from 11:00 am to 12:50 pm (may change).

6. Use of Calculators in Examinations

- Students may use any calculator of their choosing.
- No other electronic devices of any kind will be permitted in the examination

* grade for lab 2
* grade for assignment 2

7. Final Grade Determination

The final grade in this course will be based on the following components:

Component	Learning Outcome(s) Evaluated	Weight
Assignment	1-6	15% → 14.19
Lab Studies	1-6	15% → 15
Quizzes	1-6	40%
Project	1-6	15% → 14.5
Partcipation	1-6	5% → 5
Midterm	1-6	10%
		81.78
Total:		100%

33.09

26.47 40
33.0875 50
≈33.09

Notes:
a) It is NECESSARY to earn a TOTAL of 50% or higher in the quizzes and midterm exam, in order to pass the course as a whole. Thus, students must obtain at least 25.0 out of 50, which is the sum of midterm and quizzes.
b) Conversion from a score out of 100 to a letter grade will be done using the conversion chart shown below. This grading scale can only be changed during the term if the grades will not be lowered.

Letter Grade	Total Mark (T)
A+	T ≥ 96.0%
A	93.0% ≤ T < 96.0%
A-	88.0% ≤ T < 93.0%
B+	82.0% ≤ T < 88.0%
B	78.0% ≤ T < 82.0%
B-	73.0% ≤ T < 78.0%
C+	68.0% ≤ T < 73.0%
C	63.0% ≤ T < 68.0%
C-	58.0% ≤ T < 63.0%
D+	53.0% ≤ T < 58.0%
D	50.0% ≤ T < 53.0%
F	T < 50.0%

← 81.78%

8. Textbook

The following textbook(s) is required for this course:

Title	Microelectronic Circuits
Author(s)	Sedra/Smith
Edition, Year	Seventh, 2014
Publisher	Oxford University Press

The following textbook(s) is recommended for this course:

Title	Microelectronics Circuit Analysis and Design
Author(s)	Neamen, Donald A
Edition, Year	4th, 2009 (OK to use eBook, OK to use older edition)
Publisher	McGraw-Hill Education

9. University of Calgary Policies and Supports

*SSE ADVISING AND POLICIES

All Schulich School of Engineering students have access to a D2L site titled “Engineering Student Centre”. Students have a responsibility to familiarize themselves with the policies available on this site.

*ACADEMIC MISCONDUCT

Academic Misconduct refers to student behavior which compromises proper assessment of a student's academic activities and includes: cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

For information on the Student Academic Misconduct Policy and Procedure please visit:
https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Academic-Misconduct-Policy.pdf
https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Academic-Misconduct-Procedure.pdf
Additional information is available on the Academic Integrity Website at https://ucalgary.ca/student-services/student-success/learning/academic-integrity.

*ACADEMIC ACCOMODATION

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The Student Accommodations policy is available at https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf.

Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the Procedure for Accommodations for Students with Disabilities (https://www.ucalgary.ca/policies/files/policies/https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf). SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/.

*INSTRUCTOR INTELLECTUAL PROPERTY

Course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

*FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary.

*COPYRIGHT LEGISLATION

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Acceptable-Use-of-Material-Protected-by-Copyright-Policy.pdf) and requirements of the copyright act (https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy https://www.ucalgary.ca/legal

*MEDIA RECORDING (if applicable)

Please refer to the following statement on media recording of students: https://elearn.ucalgary.ca/wp-content/uploads/2020/05/Media-Recording-in-Learning-Environments-OSP_FINAL.pdf

**Media recording for lesson capture*

The instructor may use media recordings to capture the delivery of a lecture. These recordings are intended to be used for lecture capture only and will not be used for any other purpose. Although the recording device will be fixed on the Instructor, in the event that incidental student participation is recorded, the instructor will ensure that any identifiable content (video or audio) is masked, or will seek consent to include the identifiable student content to making the content available on University approved platforms.

**Media recording for self-assessment of teaching practices*

The instructor may use media recordings as a tool for self-assessment of their teaching practices. Although the recording device will be fixed on the instructor, it is possible that student participation in the course may be inadvertently captured. These recordings will be used for instructor self-assessment only and will not be used for any other purpose.

**Media recording for the assessment of student learning*

The instructor may use media recordings as part of the assessment of students. This may include but is not limited to classroom discussions, presentations, clinical practice, or skills testing that occur during the course. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose.

SEXUAL VIOLENCE POLICY
The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the policy available at https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Sexual-and-Gender-Based-Violence-Policy.pdf

*OTHER IMPORTANT INFORMATION
Please visit the Registrar's website at: https://www.ucalgary.ca/registrar/registration/course-outlines for additional important information on the following:
•Wellness and Mental Health Resources
•Student Success
•Student Ombuds Office
•Student Union (SU) Information
•Graduate Students' Association (GSA) Information
•Emergency Evacuation/Assembly Points
•Safewalk

10. Statements Specific to Fall 2021

Course Format and Scheduling
Lectures, quizzes and labs are scheduled as in-person delivery. However, in case of any unexpected situation such as the COVID rfelated health restrictions, the course format and method of delivery will be adjusted accordingly. All quizzes and midterm will be conducted via D2L regardless.

Expectations for Attendance and Engagement in Sessions
Students are strongly recommended to attend the lectures and tutorials. Completion of lab studies is required.

Guidelines for Completing and Submitting Coursework

11. Additional Course Information

Missing Deadlines: Unless instructed otherwise, all deadlines will be strictly followed. Materials submitted after a given deadline will not be evaluated and will receive an automatic zero.

Lab: Unless instructed otherwise during the semester, labs are scheduled to be in-person. The students will study the lab materials by constructing circuits with physical components on breadboard. The lab studies may require use of Multisim, a powerful circuit simulator. If necessary, access to Multisim will be provided. Lab groups will be consisted of 4 students. Completion of lab studies is required.

Project: There is a project on designing a radio receiver using the real components. Students will
Software requirement: Multisim 14 or higher may be required for this course. This software can be downloaded through the university IT website. Multisim runs only on Windows. Students using Mac will require Parallel or similar software for running Multisim. Students can also use online free Multisim.

Supplemental exam: No supplemental exam will be offered in this course.