

# ELEC4707A [11942] Analog Integrated Electronics (LEC) Winter 2019

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## Course Outline

This is the "official" course outline that includes the marking guidelines.

### Course Instructor

Leonard MacEachern, Ph.D., P.Eng. (APENS)  
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### Teaching Assistants

David Berton ([DavidBerton@cmail.carleton.ca](mailto:DavidBerton@cmail.carleton.ca))  
Office: 340 Azrieli Pavilion for meetings

### Email Guidelines

When sending a course-related email to the instructor, use this email address: [leonard.maceachern@carleton.ca](mailto:leonard.maceachern@carleton.ca)  
Don't be distressed if you don't get a reply right away, but if more than two days go by, then please follow up on the email.

### Office Hours

Check **cuLearn** for an up-to-date list of office hours and locations. Office hours will be adjusted throughout the term to reflect the workload (e.g. upcoming assignments, quizzes, and tests).

### Course Description:

Emphasis on integration of analog signal processing techniques in monolithic IC technology. Continuous active filter design. MOS IC technology. OP amp design. Basic sampled data concepts; Z-transform analysis, switched capacitor filters. Noise aspects. Bipolar technology: radio frequency IC design.

### Course Topics:

Suggested knowledge for this course: basics of MOSFET operation, some understanding of integrated circuit technology, understanding of circuit simulation, basics of logic, binary number systems, digital design. The following topics will be covered during the course lectures.

- Analog signal processing.
- Continuous active filter design.
- CMOS, Bipolar, BiCMOS IC technology.
- Operational amplifier design.
- Switched capacitor filters.
- Noise in analog circuitry (time permitting).

### Course Marking Scheme:

50% Final Exam (not returned to student)  
20% Midterm (returned to student) **to be held on February 13, 2019**  
5% for Assignment #1  
10% for Assignment #2  
3% each for Laboratories #1, #2, #3, #4, and #5.

Notes: **There will be a make up midterm if required.** The final exam is for evaluation purposes only, and will not be returned to the student. Laboratory #0 is not marked, and concerns lab safety, equipment/accounts. There may be a few in-class or take-home quizzes – these will not be marked and are only to serve as a means for students to check

their progress in the course. Course marks are capped at 100%.

**Class Hours:**

Mondays and Wednesdays 1:05 pm to 2:25 pm

**Class Location:**

340AP, Carleton University.

**Lab/PA Time/Location:**

Fridays 2:35pm-5:25pm, Room 340AP

Note we will commence labs on January 18/17 and we will have labs roughly every two weeks. We will confirm the lab dates as we go through the term.

**Assignment and Lab Policies:**

Assignments and labs must be submitted by the time/date indicated on the assignment/lab in order to receive full marks. Late assignments/labs will be accepted according to the penalty schedule given on the assignment/lab. Typically, the later your assignment/lab is handed in, the more points you lose.

**Accommodation Policy:**

Please review the following guidelines and take the necessary actions.

<http://carleton.ca/equity/accommodation/>

**Textbook:**

There is no official textbook for this course. However, there are several textbooks that you might find useful when learning the course material. Check **cuLearn** for an up-to-date list of recommended reference texts.

Last modified: Tuesday, 8 January 2019, 12:11 PM

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