

COURSE OUTLINE

SCHOOL: School of Engineering Technology and Applied Science

DEPARTMENT: Information and Communication Engineering Technology

PROGRAM: Electronics Engineering Technology

COURSE TITLE: Electronics 2

COURSE CODE: ETEC 201

TOTAL COURSE HOURS: 60

PRE-REQUISITES/CO-REQUISITES: ETEC 121, ETEC 123

**COURSE ELIGIBILITY FOR PRIOR LEARNING
ASSESSMENT AND RECOGNITION (PLAR):** Yes

ORIGINATED BY: J. Vasek, P. Eng.

REVISED BY: J. Vasek, P. Eng.

DATE: August 2009

APPROVED BY:

Chairperson/Dean

Semester: 2009 Fall

Students should keep all course outlines for each course taken at Centennial College. These may be used to apply for transfer of credit to other educational institutions. A fee may be charged for additional or replacement copies.

COURSE DESCRIPTION:

The first part of this course presents a detailed treatment of BJT small-signal or ac parameters that are used to analyse the performance of small-signal amplifiers. The same approach is used to analyse FET amplifiers. Each new concept in this course is introduced from a systems or block-diagram approach. The second part presents the signal model of an ideal operational amplifier. Various op-amp circuit applications (both linear and nonlinear) are described. The primary emphasis throughout the course is on developing student's facility for device modeling, circuit operation and analysis as their core competencies as technicians or technologists. The method of instruction is the lecture, problem solving and discussion complemented with the laboratory experiments.

COURSE LEARNING OUTCOMES:

Upon successful completion, students will be able to:

- Define the main characteristics of an amplifier.
- Determine the input and output impedance, and the voltage, current and power gains of an amplifier, and a multistage amplifier.
- Analyze BJT and FET amplifiers and determine the input and output resistance and gain.
- Analyse the frequency response of passive RC filters.
- Measure the frequency response of BJT and FET amplifiers.
- Describe and Analyse the variety of Ideal Operational Amplifier Circuits.
- Document lab experiment measurements and observations.

ESSENTIAL EMPLOYABILITY SKILLS (EES):

This course supports the students' ability to:

- Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- Apply a systematic approach to solve problems.
- Analyze, evaluate, and apply relevant information from a variety of sources.
- Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
- Manage the use of time and other resources to complete projects.
- Take responsibility for one's own actions, decisions, and consequences.

PRIOR LEARNING ASSESSMENT & RECOGNITION PROCESS (ES):

This course is eligible for PLAR through the Registrar and SETAS offices. Assessment of portfolio and/or testing may be discussed with faculty.

EVALUATION & GRADING SYSTEM:

Theory:

Midterm Test	30%
Final Test	40%

Lab:

Lab Measurements	15%
Lab Completion/Questions	15%

STUDENT ACCOMMODATION:

All students have the right to study in an environment that is free from discrimination and/or harassment. It is College policy to provide accommodation based on grounds defined in the *Ontario Human Rights Code*. Accommodation may include changes or modifications to standard practices.

Students with disabilities who require academic accommodations must register with the Centre for Student with Disabilities. Please see the Centre for Students with Disabilities for details.

Students requiring accommodation based on human rights grounds should talk with their professors as early as possible. Details are available on the Centennial College website (www.centennialcollege.ca)

If students are unable to write an examination due to a medical problem or unforeseen family problems, they should immediately contact their professor or program Chair for advice. In exceptional and well-documented circumstances (e.g. unexpected family problems, serious illness, or death of a close family member), students should be able to write a make-up examination to replace an examination missed.

Course Policies:

- Attendance in the labs is required; marks will be deducted for each lab not attended.
- Students must pass both the theory and lab components to be successful in this course.
- No students will be allowed to conduct a lab experiment without the lab manual and required parts. Every student must obtain all the necessary parts required for the lab experiments.
- Lab “partners” are expected to contribute equally to the lab preparation and completion. Those who failed to come prepared and participate equally will receive a 50% deduction for the lab.
- Late lab assignments must have the prior accommodation approval of the faculty.
- Being late for lectures and labs will not be tolerated, and may result in penalties

TEXT AND OTHER INSTRUCTIONAL/LEARNING MATERIALS:

Thomas L. Floyd, “Electronic Devices and Circuits”, 8th edition, Pearson Prentice Hall, 2008
ISBN 0-13-114080-9

Lab Manual will be provided.

Reference Books:

William D. Stanley, “Operational Amplifiers with Linear Integrated Circuits, Maxwell Macmillan Canada

Boylestad and Nashelsky’s “Electronic Devices and Circuit Theory, Canadian Edition, Person Education Canada

Robert T. Paynter, “Electronic Devices and Circuits”, Person Education Canada

USE OF DICTIONARIES:

Dictionaries may be used in tests and examinations, or in portions of tests and examinations, as long as they are non-electronic (not capable of storing information) and hard copy (reviewed by the invigilator to ensure notes are not incorporated that would affect test or examination integrity)

Disclaimer:

The College will use reasonable effort to deliver the course details as described in the following table. However, the timing of delivery may vary from week to week. For example, some topics may be combined into one week or a single topic could be extended over several weeks. In addition, external factors such as weather, transportation, power failures and illness can also influence the timing and availability of the course content. Students are encouraged to read the course materials prior to attending classes in order to enhance their overall learning experience.

POLICY STATEMENTS

College Policies

The following statements are selected from Centennial College policies approved by the Board of Governors.

Student Responsibilities

Students are expected to know the contents of the course outline and to discuss with the professor any areas where clarification is required.

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Other Policies

Students should familiarize themselves with all College Policies that cover students' rights, responsibilities, and the Academic Appeal process. For further information, consult the Academic Matters Section in the full-time and continuing education calendars. The Academic Appeal Application form is available from any Enrolment Services (Registrar) Office.

Proof of Student Status

Students are obliged to produce official photo identification at any time during the semester when requested to do so by any professor. (The official piece is the Centennial Student Card.) Continuing Education students do not have Centennial Student Cards, and so they may use other forms of photo identification, such as a driver's license, health card, or other government-issued photo identification.

Final Examinations

When writing a test or examination, students must put their official photo-ID cards in full view, for review by the invigilator. Students who do not have official photo-ID will be permitted to write the examination with a substitute photo-ID, but they will be required to produce photo-ID at the program or department office within 24 hours or the next business day following the examination, or else the examination results will be void.

Faculty Consultation

Professors are available to see students outside of class time. Students can contact professors via voice mail, email, or through their program or department office. Information regarding how to contact teachers will be provided at the beginning of the course and is also available in the program or department office.

Human Rights Statement

It is the policy of the College that all programs will strive for a learning, teaching, and working environment that promotes inclusion, understanding and respect for all students and employees, consistent with the *Ontario Human Rights Code* and the Centennial College's *Statement of Diversity*.

WEEK	TOPIC/CONTENT	READING	LEARNING OUTCOMES	INSTRUCTIONAL STRATEGIES USED	COURSE EVALUATIONS (TESTS & ASSIGNMENTS USED)
1	Course Requirements	Course Outline	Explain the course content, evaluation system, lab requirements, and course policies.	Lecture and Lab	
2-5	Small-signal BJT Amplifiers	Ch. 6 Notes	ac Amplifier Fundamentals Multistage Amplifier Amplifier Analysis - Small-Signal Models Capacitively Coupled Amplifiers	Lectures and Labs	
6-7	Small-signal FET Amplifiers	Ch. 9 Notes	Common-Source JFET Amplifier Common-Drain JFET Amplifier The Analog Switch	Lectures and Labs	
8-9	Amplifier Frequency Response	Ch. 10	Definitions and Basic Concepts Frequency Response of BJT Amplifier Frequency Response of FET Amplifier	Lectures and Labs	MIDTERM TEST
10-12	Ideal Operational Amplifier Circuits and Analysis	Ch. 12 Notes	Inverting and Noninverting Amplifier Summing Amplifier Differential Amplifier Instrumentation Amplifier	Lectures and Labs	
13-14	Controlled Sources Voltage Comparators	Ch. 13 Notes	Controlled Voltage and Current Sources Zero-crossing Comparators and Schmitt Triggers	Lectures and Labs	
15					FINAL TEST