VANIER
CÉGEP/COLLEGE
My choice. My future.

Computer Engineering
Technology Department

Course Outline

FACULTY:	**Faculty of Science and Technology**
PROGRAM(S):	**243.A0 Computer Engineering Technology**
DEPARTMENT:	**247 Computer Engineering Technology**
COURSE TITLE:	**CIRCUIT ANALYSIS AND SIMULATION II**
COURSE NUMBER:	**247-205-VA**
COURSE SECTION(S):	00001, 00002
PONDERATION:	2-3-2 lecture - labwork - homework
NUMBER OF CREDITS:	2.33 credits
PREREQUISITE(S):	247-105-VA Circuit Analysis and Simulation I
COREQUISITE(S):	201-202-VA Math for Computer Engineering Technology II
SEMESTER:	Semester 2
SEMESTER/YEAR:	Winter 2020
TEACHER:	**Theory**

Day Yann Fong	Office	K-311
	Tel.	514-744-7500 x 8335
	E-mail	Use MIO
	Availability	Tue 10:00 -12:00, 14:00 – 16:00; Thu 14:00 – 16:00; or by appointment

Laboratory

Andreea Iftimie	Office	D-366
	Tel.	514-744-7500 x 7753
	E-mail	Use MIO
	Availability	Mon 10:00 -12:00, 13:00 – 14:30; Wed 10:00 – 12:00; or by appointment
Manijeh Khataie	Office	N-245
	Tel.	514-744-7500 x 7535
	E-mail	Use MIO
	Availability	Mon 14:00 -16:30; Wed 12:00 – 14:00; or by appointment

Description

This course will provide the student with a hands-on understanding of the fundamental concepts of alternating current (AC), analog circuits, amplifiers, schematics, and component datasheets. It also includes concepts of complex impedance and power. Students will learn and integrate related mathematical concepts including concept of phasors in circuit impedance and reactance, measurement in decibel for filter response. Emphases will be on transistors, amplifiers and filters used to interface to microcontrollers.

Laboratory exercises will allow the student to apply the knowledge as they interpret circuit diagrams, examine circuits, construct, measure and troubleshoot practical circuits using discrete passive components along with active components such as Diodes, Bipolar Junction Transistors and Operational Amplifiers. They will also perform circuit simulations and troubleshooting using professional CAD.

Students will learn how to use and connect appropriate test equipment, record data for verification and to troubleshoot circuit problems. Students will also learn to interpret and process verification results. They will write reports that includes diagrams, tables, charts and plots, using the proper terminology.

Statement of Competencies

037E To diagnose an analog electronics problem

1. Become familiar with the problem and specifications.
2. Identify anomalies.
3. Take measurements.
4. Analyse the results
5. Determine the cause or causes of the problem.
6. Write a report.

Tentative course and corresponding lab content

Week duration	Theory Topics (Wed 3:30pm – 5:30pm)	Tentative Lab Activities (Mon : 2:30pm – 5:30pm, Thu : 2 :30pm – 5 :30pm)
1	Presentation of Course Outline. Fundamental of AC circuits.	Familiarization with Digital Signal Oscilloscope (DSO)
2	Capacitors and DC charging	AC circuit and measurements
3	RC Circuits in AC	RC transient circuit
4	Introduction to semiconductor	AC Series RC circuits
5	Diode and applications	Frequency response of RC circuit
6	Special purpose diodes	High Pass filter and unknown capacitor
7	*** Midterm Test ***	Diode and rectifier
8	Bipolar transistor and biasing	Applications of diodes
9	~~~ Mid-Term Break ~~~	
10		
11	Briefing and review	Proteus installation
12	Applications of BJTs	Intro to Proteus and transistor biasing
13	Operational Amplifier	Class A amplifier
14	Application of Op-amps	Transistor as switch
15	Review	Op-amp application
16	Final Assessment (subject to change)	**Lab Test ** only if we are back in school**

Course Material Required

- Hand-outs will be provided as required and reading maybe be assigned
- Breadboard
- USB stick

Bibliography

- *Electronics Fundamentals : A System Approach. By Thomas L. Floyd, David M. Buchla.*
- *Introductory Circuit Analysis. By R.L. Boylestad.*
- *Circuits électroniques. By Trussart Louis (French book)*

Course Structure

THEORY:	2 hour / week	Lectures and demonstrations, discussions and problem solving with student participation.
LABORATORY:	3 hours / week	Demonstrations, lab activities and work performed by students, and results presented. Detailed report written by the students demonstrating an understanding of the competencies addressed. Individual lab project completed and documented in report.
HOMEWORK:	2 hour / week	The student will be expected to devote approximately 2 hour per week to homework.

ATTENDANCE

THEORY:	Consistent attendance is strongly recommended. **Students are responsible for obtaining all material covered during any absence.**
LABORATORY:	Laboratory sessions are part of assessment activities. Failure to complete lab activities assigned in the designated lab class without just cause may result in a failure of the lab session and any results and/or lab report derived from the session. In order to meet and be evaluated on the course competencies lab attendance is required. Note that there is both a separate and an integrated **professionalism** mark associated with the course (see below). During the lab periods, you are expected to work on your assignments. It is not permitted to use the internet during lab periods outside the scope of the lab.
TESTS:	Absence will result in failure of the missed test (mark of 0). Students with a just cause for absence are encouraged to seek alternative arrangements with the instructor – beforehand if possible. College policies on just cause will apply.

EVALUATION

The final mark will be weighted:	60% theory	*12%*	*Quizzes*
		20%	*Midterm test*
		25%	*Weekly assignments and Final Assessment*
		3%	*Professionalism, participation, English proficiency*
	40% lab	*28%*	*Laboratories*
		9%	*Lab tests*
		3%	*Professionalism, participation, English proficiency*
	Total	**100%**	

The following general rules apply:

- A minimum mark of 60% is required to pass the course **AND** at least 50% in the Theory portion **AND** at least 50% in the Lab portion. If the mark is less than 50% for either the Theory o**r** Lab portion, the total mark will not exceed 55%.
- At least one week's notice will be given for test dates or changes in test dates.
- Quizzes may be given without prior notice – there are no make-ups for quizzes (mark of 0 for missed quizzes).
- **Students are expected to conduct themselves in a professional manner at all times.** This includes but is not limited to:
  - Arriving to laboratory on time and prepared to do the required work;
  - Conducting themselves in an appropriate manner at all times (including being respectful to the teacher, classmates, and any guests);
  - Using professional language (no cursing and/or swearing and using appropriate vocabulary);
  - Arriving to class/lab with all necessary supplies (logbook, notebook, textbook, manual, paper, writing implements, calculator, etc.);
  - Turning off all personal communication/music/video electronics (removing headphones, earphones, ear buds etc.); and
  - Having all assigned work completed.
- Remember that developing professional behaviours and habits now is an important aspect of preparation for entering a professional work environment in the future.
- Students are expected to take their own notes during classes.
- Reports must be typed and computer generated according to the guidelines.
- When requested, Lab preparations and Lab Results/logbooks are to be handed in during the lab session. Late Lab Preparations/Lab Results may not be accepted, and a zero mark will be recorded.
- Reports are due one week after they are assigned unless the instructor provides a specific due date.
- **ALL** assigned work (assignment, lab report etc) must be submitted **ON TIME**. **NO LATE SUBMISSION WILL BE ACCEPTED**, unless for valid reasons that was communicated to the instructor at least 2 days prior to the deadline.
- In-class assignments will only be accepted in the class in which they are assigned.
- Students who are consistently late for class may be refused entry.
- All grades are reported on a numeric scale from 0% to 100%. The following categories briefly describe the relative value of these grades.

range	mean	Description
90 - 100	**95**	Excellent, mastery of the objectives
80 - 89	**85**	Very Good mastery of the objectives
65 - 79	**72**	Good, mastery of objectives
60 - 64	**62**	Fair mastery of objectives
0 - 59	n/a	Poor mastery of objectives

Important Assessment Dates

The following dates are tentative and will be confirmed at least 1 week in advance

- Midterm Test : Week 7 (4th Mar 2020)
- Final Exam : Week 16 (6th May 2020)
- Lab Test : Week 14/15 (23/27th April 2020)

Academic and other Resources

If at any point in the semester you are concerned about the course or you realise that you are having academic difficulties, your first resource should be to talk to me, your teacher. Academic difficulties include problems with the understanding of the theory, to the development of the practical skills required by the course. The earlier you look for help, the greater your chances of succeeding in the course. If I don't feel I can provide you with the help you need then I may recommend one of the College resources below.

For other problems or difficulties, you may encounter while at Vanier there are a number of Services available to help you within the college. They are there for you to use. These include:

Student Services (C203): Some areas where they provide services and/or information are:

Services for students with disabilities	Counselling (personal and other problems)
Student Advocate	Financial Aid (including aid and scholarships)
Health Services (Nurse on staff)	Student Employment
Academic and Behaviour Policies	Lockers
Housing	Volunteering

Student Services is a great resource for questions about college life and any problems you encounter while at Vanier. If they don't have the answer they can direct you to the right place to find it.

The Learning Center - TLC (B205): Student-orientated centre dedicated to promoting and aiding students' development and success in academics and in society.

Admissions and placement tests	Learning Disabilities (advantages to registering)
English Exit Exam	English conversation and pronunciation clubs
English Peer Tutoring	Scholarship information
Vanier Native Program	Diversity support

The Learning Center is the main college resource for students with learning difficulties and for students with weak English language skills.

Math and Science Center (F540): The Mathematics & Science Centre aims to promote student success in mathematics and science.

Drop-in help	Teachers and Peer Tutoring
Private Tutoring	Various Clubs

Mediation and Grades Review

There are two committees available to the student for resolution of academic complaints.

1. The *Grades Review Committee* to review complaints concerning the grading of students' work.
2. The *Faculty Mediation Committee* to review academic complaints other than those dealing with student grades – see *Student Academic Complaints* below.

General College Academic Policies:

It is the student's responsibility to be familiar with and adhere to all Vanier College Policies. A summary of the course-level policies that apply in this and all other Vanier courses can be found under “Course-Level Policies” in Important Vanier Links on Omnivox, or by following this link: http://www.vaniercollege.qc.ca/psi/course-level-policies/. Complete policies can be found on the Vanier College website, under Policies.