Course Outline

FACULTY:	**Faculty of Science and Technology**
PROGRAM(S):	**Computer Engineering Technology**
DEPARTMENT:	**Computer Engineering Technology**
COURSE TITLE:	**Computational Logic Circuits**
COURSE NUMBER:	**247-207-VA**
COURSE SECTION(S):	0001, 0002
PONDERATION:	2-3-2 lecture - lab work - homework
NUMBER OF CREDITS:	2.33 credits
PREREQUISITE(S):	247-107-VA Fundamental Circuits
SEMESTER/YEAR:	Semester2/2020
TEACHER:	Subash Handa Office: K-309 Tel: 514-744-7500 Ex. 7756 E-mail: handas@vaniercollege.qc.ca
AVAILABILITY:	Office Hours: Tuesday: 2:30 – 4 pm or by appointment.

Course Description:

In this course, students design logic circuits of modern computers. They will design sequential logic circuits using different technologies. They will diagnose sequential logic circuit problems and make a report. Students will use component datasheets extensively.

Students will learn to design sequential circuits and will apply this knowledge as they interpret circuit diagrams, examine circuits, perform circuit simulations, and troubleshoot problems using appropriate techniques and test equipment.

Students will produce comprehensive report of their work.

Statement of Competency

Competency 037C—To process technical information

Achievement Context:

- Processing information related to current and new technologies
- Working with standards, data sheets, specifications, diagrams and manufacturers' recommendations
- Using appropriate French and English technical documentation, a networked computer and appropriate software

Element 1:	Gather technical information.
Element 2:	Organize the information.
Element 3:	Record the information.
Element 4:	Present the information.

Competency 037F—To diagnose digital electronics problems

Achievement Context:

- Working with various digital circuits, storage devices and data acquisition systems, digital circuit diagrams and equipment with a digital electronic defect
- Following procedures
- Using appropriate French and English technical documentation, measuring instruments and tools, antistatic equipment, a networked computer, diagnostic tools and simulation software
- In conformity with occupational health and safety rules

Element 1:	Become familiar with the problem and specifications.
Element 2:	Identify anomalies.
Element 3:	Take Measurements.
Element 4:	Analyze the Results
Element 5:	Determine the cause or causes of the problem.
Element 6:	Write a report

MINIMUM REQUIREMENTS:

Where specified, students are to read the required reading every week of the semester. Readings may be added or changed at the instructor's discretion. The following week, students should expect to be evaluated with a brief quiz on the prior week's subject.

- Class notes taken by the student.
- Handouts as required.
- Reference materials, as required
- USB Stick, Storage of all files for the course

For this course, all students are required to *buy the online book* by following the procedures listed below:

1. Sign in or create an account at learn.zybooks.com
2. Enter zyBook code: Vanier247207VAHandaSpring2020
3. Subscribe

Course Content and Tentative Dates **(see *Note1)**

Week	Theory	Lab
1	Outline, Review, Binary, Hexadecimal arithmetic	**Conversion**
2	Combinational Logic I - Karnaugh map sum-of-products	**K map**
3	Combinational Logic I - Karnaugh map product-of-sums	**SOP/POS**
4	Combination Logic II – muxes/decoders/adders	**Multiplexer**
5	Combination Logic II – adders	**Adder**
6	Shift Registers	**Shift Register**
7, 8, 10	Sequential Logic - Latches, Flip-Flops, Timers	**D &JK flip-flop Labs**
9	Midterm Exam	**Timers**
11, 12	FSM	**FSM Labs**
13	Introduction to programmable logic devices (PLD)	**PLD**
14	Review	**PLD**
15	Final Exam	**Catchup**

Course Structure

THEORY:	2 hours/week:	Lectures and demonstrations, discussions and problem solving with student participation.
LABORATORY:	3 hours/week:	The student will perform typical tasks in programming computerized systems. Detailed report written by the students demonstrating an understanding of the programing done.
HOMEWORK:	2 hours/week:	The students need to devote approximately 2 hour per week to homework and study.

ATTENDANCE

THEORY:	Consistent attendance is strongly recommended. **Students are responsible for obtaining all material covered during any absence.**
LABORATORY:	Failure to complete all 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).
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.

EVALUATION

The final mark will be weighted:	75% theory:	25%	Homework and Quizzes
		25%	Midterm Test
		25%	Final Test
	25% lab work:	20%	Lab Reports & lab results/Lab Exam/Online Book
		5%	Professionalism and English Profession.
	Total:	**100%**	

The following general rules apply:

- A minimum mark of 60% is required to pass the course. Student must pass the midterm and the final or receive 75% in the final exam to pass the course At least one week's notice will be given for test dates or changes in test dates.
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- Tests questions will not be re-graded after 24 hours of returning and any altered material will not be re--graded
- Quizzes may be given without prior notice – there are no make-ups for quizzes.
- Students are expected to attend all their schedule classes.
  - Absence from any lab class where specific skills are being assessed will result in a failure of that skill.
- **Students need to conduct themselves in a professional manner at all times.** This includes but is not limited to:
  - Arriving to class (theory and 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.
- Calculators with memory for equations (for example graphing calculators) will not be allowed when writing tests.
- Reports need to be typed and computer generated according to the guidelines provided by the teacher.
- 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 weeks 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**, and a zero mark will be recorded, unless a valid reason 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 (lab and/or theory) 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 8
- Project report due: Week 15
- Final Exam: Week 15

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	Teacher s 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.

Information on College Policies

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

Complete policies can also be found on the Vanier College website, under Policies.