Course Outline

FACULTY:	**Faculty of Science and Technology**
PROGRAM(S):	243.A0
DEPARTMENT:	Computer Engineering Technology
COURSE TITLE:	Computerized Systems Optimization
COURSE NUMBER:	247-607-VA
COURSE SECTION(S):	00001
PONDERATION:	2-3-2
NUMBER OF CREDITS:	2.33 credits
PREREQUISITE(S):	247-308-VA
SEMESTER/YEAR:	Sixth semester Winter 2022
TEACHER:	Serge Hould Office: K311 Tel: 514-744-7500 Ex.8330 E-mail: houlds@vaniercollege.qc.ca
AVAILABILITY:	Monday: 9:30 AM to 11:30 AM Friday: 12:00 PM to 2:00 PM

Introduction

In this course students will modify and optimize computerized system's hardware and software.
They will analyze, modify and optimize a system using a simulator, debugger or test bench.
Students will verify the system's performance and fine tune the system.
They will write reports on all modifications and optimizations done on the system.

Statement of Competency

037STo program computerized systems

Competency

1. Become familiar with the specifications
2. Define algorithms
3. Customize the environment
4. Code the program
5. Perform compilation exercises
6. Conduct tests
7. Optimize the code
8. Document the program

037U To perform activities related to optimizing a computerized system

1. Analyze the existing system's performance and characteristics.
2. Identify the hardware and software modifications to be made.
3. Modify the system.
4. Check the system's operation
5. Document the optimization

Bibliography

1. Programming with POSIX Threads by David R. Butenhof

2. PThreads Primer - A Guide to Multithreaded Programming by Bill Lewis and Daniel J. Berg

Please note that the modality and detailed calendar of this course may need to be modified as a result of changing government health regulations. Should changes become necessary, this course outline will be modified accordingly.

Week	Theory topics – 2.5 hour periods	Tentative lab activities- 4 hour periods
1	Intro multi threading	Lab1: Intro to multi threading
2	Synchronisation and mutex	Lab2: Mutexes and intro to Ncurse
3	Servomotor	Lab3: Multi-threading application
4	Mover4 robot arm	Lab4: Intro to Mover4 robot arm controller
5	Kinematics	Lab4: continue
6	***Mid-term exam***	Lab5: BBB controlled Mover4 robot arm
7	Inverse kinematics	Lab6: Mover4 mini assembly line
8	Robot control	Lab7: Inverse Kinematics
9	Robot control	Lab7: continue
10	Robot control	Lab8: Mover4 Inverse Kinematics - simulation
11	Revision	Lab8: continue
12	***LIA – Final Exam***	Lab8: Mover4 Inverse Kinematics – real robot

Course Structure		
THEORY:	2.5 hours/week (on 12 weeks):	Quiz, lecture, demonstration, problem solving, and discussion with student participation.
LABORATORY:	4 hours/week (on 12 weeks):	The student will perform typical tasks in programming computerized systems.
HOMEWORK:	2.5 hours/week:	The student will be expected to devote at least 2 hours per week to homework, reading datasheets and other documents.
ATTENDANCE		
THEORY:	Description (see Department Policy) Example: Consistent attendance is strongly recommended. **Students are responsible for obtaining all material covered during any absence.**	
LABORATORY:	Description (see Department Policy) 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:	Description (see Department Policy) 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:	60% theory:	15% Homework and Quizzes 20% Midterm Test 25% Learning Integrated Assessment (LIA)
	40% lab work:	Pre-lab assignment completion of lab activities & lab skills lab report English proficiency/Professionalism
	Total:	**100%**
		Use of Webcam: This course requires students to have a working webcam. Classes and assessments may be conducted using MS Teams or Zoom where the teacher may require students to turn on their webcams. Students should contact the course instructor if they require accommodations or have any questions or concerns.

Learning Integrated Assessment (LIA)
Each course includes a Learning Integration Assessment (LIA) that attests to students' achievement of the course level learning outcome that is the main knowledge, skills, and attitudes to be developed. The LIA for this course is the following:
Students will be evaluated for knowledge in the theory class and for course skills in the lab class.
EVALUATION CRITERIA FOR THE LEARNING INTEGRATION ASSESSMENT
25%
STUDENT PROFICIENCY IN THE LANGUAGE OF INSTRUCTION (SPLI)
Student proficiency in the language of instruction is the ability to write, read, speak, and listen in order to communicate effectively at the college level. SPLI may also require discipline-specific vocabulary, documentation, and communication skills; assessment of language skills must account for a minimum of 10% of any take-home written assignment or oral presentation in which English is the language of expression.
In this course, you will be assessed for SPLI in the following assessments: • Lab Report

The following general rules apply:

- In this course students are required to open their webcam. It is the student's responsibility to ensure they have a working webcam for the duration of the course. However, the College has put in place measures to support students who are lacking the needed technology.
- 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.
- 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 are expected 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 must 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 two weeks after they are assigned unless the instructor provides a specific due date.
- Any assigned work submitted beyond 1 week late may not be accepted, and a zero mark may be recorded. Assigned work up to and including one week late may be reduced by up to 25% of the maximum mark.
- 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

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 do not have the answer, they can direct you to the right place to find it.

Tutoring and Academic Success Center - TASC (F-300): Student-orientated centre dedicated to promoting and aiding students' development and success in academics and in society.

Admissions and placement tests	S.T.A.R. Program
English Exit Exam	English conversation and pronunciation clubs
English Peer Tutoring	Scholarship information
Vanier Native Program	Diversity support

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

Science, Technology, Engineering and Mathematics - STEM (D-301): This Centre aims to promote student success in mathematics and science. The large interactive study space includes a hackerspace for hands-on applied projects such as robotics, and a study hub for collaborative group work. Teacher help, computers, and a large collection of math and science textbooks are equally available. We offer a number of activities, services and resources including:

Free drop-in peer tutoring	Drop-in help from teachers
Free private tutoring	Teacher-led review sessions
Computer access	Laptop borrowing

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 the **Vanier College Academic Policies**. Your attention is drawn in particular to the following policies. A brief summary of each is included. To see the full policy, Ctrl and left click on the title of the policy.

Code of Conduct Policy: The policy sets forth principles, guidelines and norms of behavior expected from all individuals present at Vanier College, including students, faculty, employees, administrators, members of the Board of Directors, contractors and visitors. The Code of conduct can be found on the College's website, under Policies and on the Omnivox Portal.

Institutional Policy on the Evaluation of Student Achievement Policy: This policy explains the general principles followed at Vanier College in the evaluation of student achievement and provides a list of rights and responsibilities of students and teachers. It is the main policy guiding student evaluation.

Student Academic Complaints (Policy number 7210-8): The Vanier College Student Academic Complaints Policy and procedures puts an emphasis on mediation as the primary means to resolve complaints in the academic area. If you have a problem with a teacher and have been unable to resolve it by talking with him or her, you may wish to enlist the help of the Faculty Mediation Committee. The committee member names and contact information are available in Student Services or through the office of the Faculty Dean.

Cheating and Plagiarism (Policy number 7210-31): Any form of cheating or plagiarism will result in a grade of zero on the test or assignment and a letter from the teacher will be placed in your file. A repeated offence may lead to even more serious consequences. For more information, consult your teacher or the policy.

Student Misconduct in the Classroom (Policy number 7210-19): This policy provides guidelines for handling cases of student misbehaviour in the classroom and other instructional settings. Such cases may include conduct that is abusive to the teacher and/or other students, or disruptive to the teaching/learning process. This policy does not limit the teacher's or the College's right to take immediate action in cases of imminent danger to persons or property.

Student Absences for Religious Holy Days (Policy number 7210-20): Students whose religious obligations require them to be absent from the College on a holy day not formally recognized in the College calendar must inform their teachers, in writing, during the first week of classes, of the particular date(s) and times of the religious holy days on which they must be absent. Absences approved in this manner are considered to be excused absences. Students are responsible for material covered in the classes and labs they miss.

Test during the last 2 weeks of the Semester (Policy number 7210-18): No test, term paper or project (or combination of these) which counts for more than 30% of the final grade should be given or should be due in the last ten teaching days (20% in the case of courses with a compulsory final exam in the final exam period).

Course Outline Policy (Item 4.6): Teachers must advise students, the Department/Program Coordinator and the Faculty Dean, in writing, if changes in course content or procedures become absolutely necessary during the term. Discretionary changes to course content and/or procedures shall be agreed upon between the students and teacher, with written notification provided to the Department/Program Coordinator and Faculty Dean.

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.