Course Outline

FACULTY:	**Faculty of Science and Technology**	
PROGRAM(S):	**243.A0 Computer Engineering Technology**	
DEPARTMENT:	**247 Computer Engineering Technology**	
COURSE TITLE:	**NETWORK SYSTEMS DESIGN**	
COURSE NUMBER:	**247-509-VA**	
COURSE SECTION(S):	0001	
PONDERATION:	2-3-2	lecture - labwork - homework
NUMBER OF CREDITS:	2.33	credits
PREREQUISITE(S):	247-409-VA	Network Fundamentals
SEMESTER:	Semester 5	
SEMESTER/YEAR:	Autumn 2021	
TEACHER:	Day Yann Fong	
	Office	K-311
	Tel.	514-744-7500x8335
	E-mail	Use MIO or Teams
	Availability	Mon & Tue 10am – 1pm, or by appointment (in person or online meeting)

Description

The students will be exposed to both theoretical and practical aspects of networking.

- They will review the basic theoretical concepts of OSI Layered Models.
- They will do hands-on labs on network, transport, data link and physical layers.
- They will design networks using routers and switches. Students will troubleshoot network routers and switches.
- They will program, manage and troubleshoot network devices and systems.

Statement of Competencies

037H To diagnose a problem affecting a computerized systems network

1. Become familiar with the specifications.
2. Test the hardware.
3. Check the software.
4. Determine the cause or causes of the problem.
5. Record the information.

037R To write computerized system procedures

1. Focus on desired results.
2. Determine work strategies.
3. Check the effectiveness of the strategies selected.
4. Produce the final version.

Course Material Required

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

Student Personal Resources Required

- For the lab session at D-245, students are required to have their own set of hard disk drive in an external enclosure (continuation from Network Fundamentals)
    - 2.5" Hard Disk Drive (HDD) external enclosure. Must have eSATA and USB connections.
    - Internal 2.5" Solid State Drive (SSD) to fit in above enclosure must be 240 GB or greater capacity.

Bibliography

- *Network fundamentals, CCNA Exploration Companion Guide. Mark A. Dye, Rick McDonald, Antoon W. Rufi.*
- *Routing Protocols and Concepts, CCNA Exploration Companion Guide. Rick Graziani, Allan Johnson.*
- *LAN Switching and Wireless, CCNA Exploration Companion Guide. Wayne Lewis.*

Tentative course and corresponding lab content (Sequence subject to change)

All classes are scheduled to be conducted online, unless otherwise stated.

Week duration	Theory Topics (Wed : 10:30am – 12:30pm)	Tentative Lab Activities (Fri : 10:00am – 1:00pm)
1	Course Outline. Review basis of OSI layered model and subnetting.	In-class assignment : IPv4 subnetting
2	Communication over network. Advanced application layer.	In-class assignment : packet tracer skill challenge
3	Advanced TCP and UDP	Email services and protocols
4	Advanced network layer	Application and Transport layer protocols
5	Socket programming - I	Managing a web server
6	*Socket programming (Lab)*	*Network layer and Routing (theory)*
7	*Socket programming (demo)*	***** Midterm Test ******
8	*Study and Assessment Week*	
9	Addressing and testing the network	Examine device gateway and routes
10	Data link layer, MAC addressing and Ethernet	Address subnetting and router
11	Network Interconnection and configuring Cisco Devices	Frame Examination
12	Static routes	Basic topology and Cisco device configuration
13	VLAN & In class assignment	Network testing
14		Mini Project
15	Review	
16	***** Final Exam ******	***** Lab Test ******

Important Assessment Dates

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

- Midterm Test : Week 7 (7th Oct 2020)
- Final Exam : Week 16 (9th Dec 2020)
- Lab test : Week 17 (14th Dec 2020)

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. Mini project completed in small group and documented in report.
HOMEWORK:	2 hour / week	The student will be expected to devote approximately 3 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:	50% theory	*10%*	*Assignment/Quizzes*
		18%	*Midterm Test*
		19%	*Final Exam*
		3%	*Professionalism, participation, English proficiency*
	50% lab	*25%*	*laboratory*
		12%	*Lab test*
		10%	*Lab projects*
		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.
- 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 (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**, and a zero mark will be recorded, 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

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.