



## COURSE OUTLINE: NASA206 - NETWORK DESIGN

Prepared: Christopher Wood

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	NASA206: ENTERPRISE NETWORK DESIGN
<b>Program Number: Name</b>	2196: NETWRK ARCH & SEC AN
<b>Department:</b>	COMPUTER STUDIES
<b>Semesters/Terms:</b>	22W
<b>Course Description:</b>	This course will examine the business-needs based design of enterprise networks. Analysis will focus on selecting technologies to securely implement backbone, distribution and access layers utilizing the most appropriate protocols. Models are used to answer management, security, resiliency, and flexibility concerns in office, mobile, virtual, cloud and data centre environments.
<b>Total Credits:</b>	2
<b>Hours/Week:</b>	3
<b>Total Hours:</b>	45
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Essential Employability Skills (EES) addressed in this course:</b>	<p>EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.</p> <p>EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>EES 4 Apply a systematic approach to solve problems.</p> <p>EES 5 Use a variety of thinking skills to anticipate and solve problems.</p> <p>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>EES 10 Manage the use of time and other resources to complete projects.</p> <p>EES 11 Take responsibility for ones own actions, decisions, and consequences.</p>
<b>Course Evaluation:</b>	<p>Passing Grade: 50%, D</p> <p>A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.</p>
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p>Grade Definition Grade Point Equivalent A+ 90 - 100% 4.00</p>

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2021-2022 academic year.



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A 80 - 89% 4.00  
B 70 - 79% 3.00  
C 60 - 69% 2.00  
D 50 - 59% 1.00  
F(Fail) below 50% 0.00

**CR (Credit)**

Credit for diploma requirements has been awarded.

S Satisfactory achievement in field/clinical placement or non-graded subject area.

U Unsatisfactory achievement in field/clinical placement or non-graded subject area.

X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.

NR Grade not reported to Registrar's office.

W Student has withdrawn from the course without academic penalty.

**OTHER EVALUATION CONSIDERATIONS**

1. In order to pass this course the student must obtain an overall test/quiz average of 50% or better, as well as, an overall assignment average of 50% or better. A student who is not present to write a particular test/quiz, and does not notify the professor beforehand of their intended absence, may be subject to a zero grade on that test/quiz.

2. There will be no supplemental or make-up quizzes/tests in this course unless there are extenuating circumstances.

3. Assignments must be submitted by the due date according to the specifications of the professor. Late assignments will normally be given a mark of zero. Late assignments will only be marked at the discretion of the professor in cases where there were extenuating circumstances.

4. Any assignment/projects submissions, deemed to be copied, will result in a zero grade being assigned to all students involved in that particular incident.

5. It is the responsibility of the student to ask the professor to clarify any assignment requirements.

6. The professor reserves the right to modify the assessment process to meet any changing needs of the class.

**Attendance:**

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance, therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers may not be granted admission to the room.

Absences due to medical or other unavoidable circumstances should be discussed with the professor, otherwise a penalty may be assessed. The penalty depends on course hours and will be applied as follows:

Course Hours Deduction

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5 hrs/week (75 hrs) 1.0% /hr  
 4 hrs/week (60 hrs) 1.5% /hr  
 3 hrs/week (45 hrs) 2.0% /hr  
 2 hrs/week (30 hrs) 3.0% /hr

Final penalties will be reviewed and assessed at the discretion of the professor.

**Course Outcomes and Learning Objectives:**

<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>
1. Analyze Business Goals, Constraints, Technical Goals and Tradeoffs.	1.1 demonstrate an understanding of design methodology and life cycles 1.2 analyze business goals and constraints 1.3 identify scope of design projects and customer network applications 1.4 describe and explain Network Scalability and Availability 1.5 describe and explain Network Performance, Security and Manageability 1.6 decide and explain network design tradeoffs 1.7 create and apply technical goals checklist
<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
2. Characterizing the Existing Internetwork and Network Traffic	2.1 characterize a network infrastructure: 2.1.1 develop a network map, including addressing, naming, wiring, etc. 2.1.2 checking Architectural and Environmental Constraints 2.2 checking the health of the existing internetwork: 2.2.1 develop a baseline of network performance 2.2.2 analyze network availability, utilization, accuracy, efficiency 2.2.3 checking status of major routers, switches and firewalls 2.3 utilize a network health checklist 2.4 characterize network traffic flow, load and behaviour 2.5 describe and characterize quality of service requirements (QoS) 2.6 utilize a network traffic checklist
<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
3. Logical Network Design	3.1 describe and apply the network hierarchical design model 3.2 describe modular network designs 3.3 describe and apply various key design topologies: 3.3.1 redundant 3.3.2 campus network 3.3.3 enterprise edge 3.3.4 security 3.4 describe guidelines for assigning IP addresses 3.5 describe guidelines for naming models 3.6 describe and apply the decision making process of network design 3.7 identify, decide and implement switching and routing protocols 3.8 analyze, develop and maintain security policies 3.9 describe and implement security mechanisms 3.10 understand and describe modular security design

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<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
4. Physical Network Design	4.1 describe and understand selecting technologies and devices for campus networks. 4.1.1 describe and implement LAN technologies 4.2 describe criteria for selecting campus network devices 4.3 describe criteria for selecting enterprise network devices: 4.3.1 remote access technologies 4.3.2 selecting remote access devices 4.3.3 WAN technologies 4.4 design and implement a campus and enterprise network design
<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
5. Cloud Architecture	5.1 define and describe fundamentals of cloud architecture 5.1.1 workload distribution 5.1.2 resource pooling 5.1.3 dynamic scalability 5.1.4 elastic resource capacity 5.1.5 service load balancing 5.1.6 cloud bursting 5.1.7 elastic disk provisioning 5.1.8 redundant storage
<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>
6. IoT Architecture	6.1 define and describe IoT Architecture: 6.1.1 ITU-T IoT Reference Model 6.1.2 IoT World Forum Reference Model 6.2 define and describe IoT implementation: 6.2.1 IoTivity 6.2.2 Cisco IoT System 6.2.3 ioBridge
<b>Course Outcome 7</b>	<b>Learning Objectives for Course Outcome 7</b>
7. Software Defined Networking (SDN) / Network Functions Virtualization (NFV)	7.1 define and describe SDN and NFV 7.2 describe NFV design practices 7.3 describe SDN design practices: 7.3.1 placement of SDN elements 7.3.2 SDN controller functions 7.3.3 use of multiple SDN controllers
<b>Course Outcome 8</b>	<b>Learning Objectives for Course Outcome 8</b>
8. Testing, Optimizing and Documenting	8.1 describe the process of building and testing a prototype network 8.2 understand and apply writing and implementing a network test plan 8.3 define and describe tools for testing network designs 8.4 describe optimizing bandwidth usage 8.5 define and describe reducing serialization delay 8.6 define Cisco IOS features for optimizing network performance 8.7 describe and implement a customer request for proposal 8.8 describe and apply contents of a network design document

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**Evaluation Process and Grading System:**

<b>Evaluation Type</b>	<b>Evaluation Weight</b>
Attendance	10%
Labs and Assignments	25%
Quizzes	15%
Tests	50%

**Date:**

September 7, 2021

**Addendum:**

Please refer to the course outline addendum on the Learning Management System for further information.

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