

# COMP2190 – Semester 1 2025/2026

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<b>Title</b>	Net Centric Computing
<b>Course Code</b>	COMP2190
<b>Credits</b>	3
<b>Level</b>	2
<b>Prerequisite</b>	COMP1126, COMP1127, COMP1161, and COMP1210
<b>Instructor</b>	Daniel T. Fokum, Ph.D.
<b>Email</b>	Daniel.fokum@uwimona.edu.jm
<b>Lecture Location and Time</b>	Monday: 1200 – 1300 (IFLT) Tuesday: 0900 – 1100 (IFLT)
<b>Tutors</b>	<ol style="list-style-type: none"><li>1. Dr. Amit Ramkissoon</li><li>2. Mr. McKeane Thomas</li><li>3. Mr. Clifton McCook</li><li>4. Mr. Anthony Drummonds (WJC)</li></ol>
<b>Tutorial Locations and Times</b>	<ol style="list-style-type: none"><li>1. Monday: 1300—1400 (AD)</li><li>2. Tuesday: 1200—1300 (DF)</li><li>3. Wednesday: 1000 – 1100 (AD)</li><li>4. Wednesday: 1100—1200 (AD)</li><li>5. Wednesday: 1200—1300 (AD)</li><li>6. Wednesday: 1500—1600 (MT)</li><li>7. Thursday: 0900—1000</li><li>8. Thursday: 1100—1200</li><li>9. Monday: 0900—1000</li></ol>
<b>Office hours</b>	Monday: 1400 – 1500, or by appointment

## Rationale

Advances in computer and telecommunications networking, security, and the pervasiveness of the Internet have increased the importance of the related underlying technologies in the computing discipline. As a result, the Association for Computing Machinery (ACM)/IEEE-CS curriculum recommendations for computer science make Net Centric Computing a core requirement for a computing degree. This Net Centric Computing course allows students to understand the foundations upon which computer networks are built and how to secure these networks.

## Course Description

Net Centric computing covers a wide range of sub-specialities including: computer communication network concepts and protocols, mobile and wireless computing, and distributed systems. The Net-Centric Computing course also exposes students to important aspects of secure systems development including cryptography, intrusion detection and malware detection. Finally, this course will also expose students to Web technologies including: basic server-side and client-side scripts.

## Outcomes

Upon successful completion of this course, students should be able to:

- Discuss the evolution of early networks and the Internet.
- Explain the hierarchical, layered structure of a typical network architecture.
- Identify the protocols between a range of common networked applications including e-mail, telnet, FTP, wikis, and Web browsers, online Web courses and instant messaging.
- Describe the responsibilities of the physical, data link, network, transport, and application layers.
- Explain how a network can detect and correct transmission errors.
- Explain how a packet is routed over the Internet.
- Create and configure a simple network with two clients and a single server using standard host configuration software tools such as DHCP and DNS.
- Identify protocols used to enhance Internet communication and choose the appropriate protocol for a particular case.
- Discuss intrusions and intrusion detection.
- Discuss the fundamental ideas of cryptography, with particular emphasis on public-key cryptography and its use in contemporary communication.
- Generate and distribute a key pair to be used to send an encrypted e-mail message.
- Describe and discuss recent successful security attacks.
- Summarize the strengths and weaknesses associated with different approaches to security.
- Explain the different roles and responsibilities of clients and servers for a range of possible applications.
- Design and build a simple interactive Web-based application that incorporates fundamental security considerations.
- Describe emerging technologies in the Net-centric computing area and assess their current capabilities, limitations and near-term potential.

## Course Outline

- ❖ Introduction
  - Background and history of network and the Internet
  - Network architectures
  - Networks and protocols
  - Client/server and peer-to-peer paradigms
  - Mobile and wireless computing
- ❖ Network Communication
  - Network standards and standardization bodies
  - The ISO 7-layer reference model in general and its instantiation in TCP/IP.
  - Overview of physical and data link layer concepts (framing, error control, flow control, and protocols)

- Data link layer access control concepts.
- Internetworking and routing (routing algorithms, internetworking, and congestion control).
- Transport layer services (connection establishment, performance issues, flow and error control).
- Web protocols with particular emphasis on HTTP.
- ❖ Distributed computing
- ❖ Network Security
  - Fundamentals of cryptography
    - Secret-key algorithms
    - Public-key algorithms
  - Authentication protocols
  - Network attack types, e.g., denial of service, flooding, sniffing, and traffic redirection.
  - Basic network defence tools and strategies
    - Intrusion detection
    - Firewalls
    - Detection of malware
    - Kerberos
    - IPSec
    - Virtual Private Networks
    - Network Address Translation
- ❖ Web technologies
  - Basic server-side programs (php, MySQL)
  - Basic client-side scripts (XHTML, XML, JavaScript, CSS)
  - Nature of the client-server relationship
  - Support tools for Web site creation and Web management

## Assessment

Coursework	50%
<ul style="list-style-type: none"> <li>• In-course test</li> <li>• Quizzes</li> <li>• Written assignments</li> <li>• Projects</li> </ul>	<ul style="list-style-type: none"> <li>• 10%</li> <li>• 5%</li> <li>• 10%</li> <li>• 25%</li> </ul>
Final exam, 2-hours	50%

## Readings

1. Computer Networking: A Top-Down Approach, 7/E  
James F. Kurose and Keith W. Ross  
Addison Wesley, 2017, 864pp, paper, ISBN-13: 978-0133594140
2. Web Programming Step by Step, 2/E  
Marty Stepp, Jessica Miller, and Victoria Kirst  
Step by Step Publishing, 2012, 668pp, paper, ISBN-13: 9781105578786

## Administrative Information

1. In order to fully participate in this course, it is expected that each student will have access to the following:
  - a. A laptop with the following minimum specifications:
    - i. Intel i5 or equivalent processor
    - ii. 8 GB RAM
    - iii. 13" screen and keyboard
  - b. A reliable Internet connection with a speed of at least 2 Mbps down/1 Mbps up.
2. Email communication must be sent from your UWI email address. I will not acknowledge email sent from personal email addresses.
3. Please **TURN OFF** your cell phones during lectures, tutorials, and labs. You will have ample time to use your phones outside of class.
4. Plagiarism will not be tolerated. Programming assignments will be checked for possible plagiarism using software.
5. Students are responsible for all material presented in lectures and tutorials. If you are not present, it is your responsibility to check with your peers for the material covered. Students are also responsible for all the questions on a tutorial sheet.
6. In accordance with Department of Computing practice, students need to pass both coursework and the final exam in order to pass this course. Students who fail one or the other component will receive an FC or FE grade, respectively.
7. No extensions will be given for project submissions once we are within 24 hours of the submission date.
8. All late assignments or projects will be assessed with a 10% lateness penalty per day that they are late. Unless stated otherwise, late assignments or projects will **NOT** be accepted after three (3) days.
9. You are welcome to raise questions about your grades, but such questions will only be entertained *within five (5) days* of your grades being posted. Your grades are final five (5) days after posting.
10. In keeping with Faculty Regulations, students must have been in satisfactory attendance at the course. Students with unsatisfactory class attendance can be subject to debarment by the relevant Academic Board. Satisfactory attendance is defined as presence in at least 70% of the lectures **and** tutorials in this course.
11. Feeling stressed, anxious or just need someone to talk to? The FST Wellness Office (fstwellnessoffice@gmail.com) & The University Counselling Service (876-970-1992) are safe spaces for all students to explore challenges and receive support.

## Tentative Schedule

Week #	Lecture Topics and Readings	Tutorial	Quiz	Projects
1	0: Introduction & Course overview		Quiz 0 Quiz -1	

	I: History & Architecture I <b>Readings:</b> KR 1.1—1.7			
2	I: History & Architecture II <b>Readings:</b> KR 1.1—1.7	Tutorial 0	Quiz 1	
3	II: Application Layer I <b>Readings:</b> KR 2.1—2.2.4	Tutorial 1	Quiz 2	
4	II: Application Layer II <b>Readings:</b> KR 2.4, 2.7	Tutorial 2	Quiz 3	Project I (Application layer due)
5	III: Transport Layer <b>Readings:</b> KR 3.1—3.3, 3.5	Tutorial 3	Quiz 4	
6	IV: Network Layer <b>In-course test: Monday (12 – 1 PM)</b> <b>Readings:</b> KR 4.1, 4.3	Tutorial 4		
7	V: Link Layer and Wireless <b>Readings:</b> KR 6.1, 6.4.1—6.4.3, 7.3—7.3.4	Tutorial 5	Quiz 5	
8	VI: Security <b>Readings:</b> KR 8.1—8.4	Tutorial 6	Quiz 6	
9	VI: Security <b>Readings:</b> KR 8.5, 8.7	Tutorial 7	Quiz 7	
10	VII: Web technologies I <b>Readings:</b> Handouts	Tutorial 8	Quiz 8	Project II (Security Project due)
11	VII: Web technologies II (Server-side) <b>Readings:</b> Handouts	Tutorial 9	Quiz 9	
12	VII: Web technologies III (Databases and Web) <b>Readings:</b> Handouts	Tutorial 10	Quiz 10	
13	Course wrap-up	Tutorial 11	Quiz 11	Project III (Web technologies due)