COURSE OUTLINE: CSD122 - HARDWARE/OS/NETWORKS

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Course Code: Title	CSD122: HARDWARE, OPERATING SYSTEMS & NETWORKS
Program Number: Name	2095: COMPUTER PROGRAMMING
Department:	COMPUTER STUDIES
Academic Year:	2023-2024
Course Description:	Students receive an overview of computer hardware, software, and networking to expose them to the foundational technologies on which all computer software operates. The hardware components of a typical computer system are studied as well as system level software such as operating systems and device drivers. An introduction to assembly language gives students an understanding of how the software they create is compiled and executed. The essentials of networking are studied using working hardware to experiment with networking communication, resource sharing, and encryption.
Total Credits:	5
Hours/Week:	5
Total Hours:	70
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**2095 - COMPUTER PROGRAMMING** VLO 1 Identify, analyze, develop, implement, verify and document the requirements for a computing environment. VLO 2 Contribute to the diagnostics, troubleshooting, documenting and monitoring of technical problems using appropriate methodologies and tools. VLO 3 Implement and maintain secure computing environments. VLO 13 Contribute to the integration of network communications into software solutions by adhering to protocol standards.
Essential Employability Skills (EES) addressed in this course:	EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. EES 10 Manage the use of time and other resources to complete projects.
Course Evaluation:	Passing Grade: 50%, D

	A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	Students are expected to be present to write all tests in class, unless otherwise specified. If a student is unable to write a test due to illness or a legitimate emergency, that student must contact the professor prior to class and provide reasoning. Should the student fail to contact the professor, the student shall receive a grade of zero on the test. If a student is not present 10 minutes after the test begins, the student will be considered absent and will not be given the privilege of writing the test. Students exhibiting academic dishonesty during a test will receive an automatic zero. Please refer to the College Academic Dishonesty Policy for further information. In order to qualify to write a missed test, the student shall have: a.) attended at least 75% of the classes to-date. b.) provide the professor an acceptable explanation for his/her absence. c.) be granted permission by the professor. NOTE: The missed test that has met the above criteria will be an end-of-semester test. Labs / assignments are due on the due-date indicated by the professor. Notice by the professor will be written on the labs / assignments and verbally announced in the class. Labs and assignments that are deemed late will have the following penalty: 1 day late - 10% reduction, 2 days late, 20% reduction, 3 days late, 30% reduction. After 3 days, no late assignments and labs will be accepted. It is the responsibility of the student who has missed a class to contact the professor immediately to obtain the lab / assignment. Students are responsible for doing their own work. Labs / assignments that are handed in and are deemed identical or near identical in content may constitute academic dishonesty and result in a zero grade. Students are expected to be present to write in-classroom quizzes. There are no make-up options for missed in-class quizzes. Students have the right to learn in an environment that is distraction-free, therefore, everyone is expected to arrive on-time in class. Should lectures become distracted due to students walking in late, the professor may deny entry until the 1st break period, which is 50 minutes into the class or until that component of the lecture is complete. Grade Definition Grade Point Equivalent A+ 90 - 100% 4.00 A 80 - 89% B 70 - 79% 3.00 C 60 - 69% 2.00 D 50 - 59% 1.00 F (Fail) 49% and below 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.

Books and Required Resources:

This course uses Free Open Educational Resources only

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Describe the fundamental components of computer architecture	1.1 Identify components of a computer, including key components on the motherboard, and describe their role/function 1.2 Draw and discuss process flow diagram for a computer 1.3 Describe the sequence of events that occur when a computer starts up
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Write simple assembly language programs	2.1 Explain how a CPU manipulates data and executes program code 2.2 Describe the binary number system, and explain its importance in computer systems 2.3 Explain how machine, assembly, and high-level languages relate to each other 2.4 Describe registers and their use in assembly code 2.5 Explore basic assembly instructions, and describe what they do 2.6 Write a simple assembly program for an emulator 2.7 Discuss the advantages of high-level languages, and how they relate to assembly language
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Describe the role of operating systems	3.1 Explain how operating systems coordinate running applications and system resources 3.2 Describe the purpose of device controllers 3.3 Compare popular operating systems, and highlight important differences 3.4 Connect and configure peripheral devices
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Describe networks in general and begin building a telecommunications vocabulary.	4.1 List and describe the elements common to all networks. 4.2 Define and distinguish LAN, WAN 4.3 List and describe the 7 layers of the OSI model and 4.4 Identify various protocols at each layer and describe their purpose 4.5 Identify the method of addressing at various layers and the associated protocol data units
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Describe the features of the Network layer and explain the fundamental concepts of routing	5.1 Identify the role of the Network layer 5.2 Examine the Internet Protocol (IP), and its features for providing connectionless and best-effort service 5.3 Describe the principles used to guide the division, or grouping, of devices into networks. 5.4 Describe the hierarchical addressing of hosts and how this

	allows communication between networks. 5.5 Describe the fundamentals of routes, next-hop addresses, and packet forwarding to a destination network. 5.6 utilize switches and TRUNK ports to build VLANs and use a router to carry traffic between them 5.7 Explain the structure of IP addressing and demonstrate the ability to convert between 8-bit binary and decimal numbers. 5.8 Explain how addresses are assigned to networks by ISPs and within networks by administrators. 5.9 Verify and test connectivity and operational status of the IP protocol stack on a device using common testing utilities
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. List the features of the Transport layer protocols and services	6.1 Explain the need for the Transport layer. 6.2 Describe the role of two TCP/IP Transport layer protocols: TCP and UDP. 6.3 Explain the key functions of the Transport layer, including reliability, port addressing, and segmentation. 6.4 Identify when it is appropriate to use TCP or UDP and provide examples of applications that use each protocol.
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Describe and utilize the Application Layer and its protocols.	7.1 Describe how the functions of the three upper OSI model layers provide network services to end user applications. 7.2 Define how the Application Layer provides communication across the telecommunication network. 7.3 Identify the function of well-known TCP/IP applications, such as the World Wide Web and email, and their related services (HTTP, DNS, SMB, DHCP, SMTP, SNMP, and Telnet). 7.4 Explain how protocols ensure services running on one kind of device can send to and receive data from many different network devices.
Course Outcome 8	**Learning Objectives for Course Outcome 8**
8. Describe the nature of Encryption/Decryption and implement secure communications	8.1 Describe the nature of cryptography 8.2 Describe a hash and where it is used in cryptography 8.3 Distinguish between secret key vs public/private key encryption 8.4 Send a secure message across a communications channel 8.5 Describe how a firewall is used to secure a network 8.6 Explore other topics in security such as digital signatures and VPNs.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	10%
Labs	30%
Quizzes	10%
Test 1	16%
Test 2	17%

	Test 3 | 17%
Date:	May 31, 2023
Addendum:	Please refer to the course outline addendum on the Learning Management System for further information.