University of Asia Pacific (UAP)
Department of Computer Science & Engineering (CSE)

Course Outline: CSE 320

Program:	Computer Science & Engineering
Course Title:	Computer Networks Lab
Course Code:	CSE 320
Semester:	Fall, 2022
Level:	3-2 (Section A1 and A2)
Credit Hour:	1.50
Name & Designation of Teachers:	Sk. Tanzir Mehedi, Lecturer
Office/Room:	7th Floor, UAP Campus
Class Hours:	Monday (14:00-16:50) Tuesday (8:00-10:50)
Consultation Hours:	Thursday (12:30 – 13:50)
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Rationale:	It will help to understand the core computer networking and its application in modern technology.
Pre-requisite:	CSE 303 (Data Communication)
Course Synopsis:	This course covers the hands-on practical working experiences of building computer networks, applying routing protocols, implementing access control list, and IoT integration.
Course Objectives:	The objectives of this course are to: **1.** **Understand** the working differences between straight cable and cross over cable, peer-to-peer and client-server network. **2.** **Develop** an understanding of different components of computer networks, various protocols, modern technologies and their applications. **3.** **Use** the Packet Tracer, NS3, MATLAB Simulink to simulate various computer networks, and wireless sensor networks.

Course Outcomes (CO) and their mapping with Program outcomes (PO) and Teaching-Learning Assessment methods:

CO No.	CO Statements: Upon successful completion of the course, students should be able to:	Corresponding POs (Appendix-1)	Bloom's taxonomy domain/level (Appendix-2)	Delivery methods and activities	Assessment Tools
CO1	**Demonstrate** the concept of Computer Networking and its applications, VLSM, client-server programming	3	1/Apply	Lecture, multimedia, simulation	Quiz, Time-bound network configuration exam on simulator, Oral Exam
CO2	**Implement** the concept of routing protocols and its application in corporate network, VLAN	3	1/Apply	Lecture, multimedia, simulation	Quiz, Time-bound network configuration exam on simulator, Oral Exam
CO3	**Identify** the requirements of a corporate network and its functionality, access control list, integration of IoT	3	1/Analyze	Lecture, multimedia, simulation	Quiz, Time-bound corporate network configuration exam on simulator, Oral Exam
CO4	**Develop** the network with the modern simulation tools, i.e., packet tracer, ns3, Matlab Simulink	5	1/Evaluate	Lecture, multimedia, simulation	Quiz, Timebound network configuration exam on simulator, Oral Exam
CO5	**Design** a project based on networking ideas to solve real-life problems.	9	1/Create	Lecture, multimedia, simulation, research article discussion	Project evaluation based on rubrics

Weighting COs with Assessment methods:

Assessment Type	% weight	CO1	CO2	CO3	CO4	CO5
Final Exam will be based on time-bound network configuration exam and oral exam	**30%**	5	10		15	
Mid Term will be based on time-bound network configuration exam and oral exam	**30%**	5	15		10	
Assignment, Class Test, Presentation, Class Performance	**40%**	5	5	10	10	10
Total	**100%**	15	30	10	35	10

Grading Policy: As per the approved grading policy of UAP (Appendix-3)

Course Content Outline and mapping with COs:

Lecture	Topic	Course Outcome	Reading assignment	Work assignment
Lab 1	Introduction to networking and the Internet, basic commands ipconfig, ipconfig/all ping, tracert etc.	CO1	TCP/IP protocol	Prepare a report on basic commands of Internet
Lab 2	Intranet configuration	CO1, CO2, CO4	Intranet	Prepare a report on Intranet configuration

Lab 3	Internet configuration	CO1, CO2, CO4	Internet	Prepare a report on Internet configuration
Lab 4	Installing and setting up Packet Tracer simulator, Introduce network devices, protocols and topology i.e., HUB, Router, Switch	CO1, CO2, CO4	Network devices configurations	Prepare a report on different network devices configuration
Lab 5	Building a Local Area Network (LAN)	CO1, CO2, CO4	Local Area Network (LAN)	Designing a corporate network with branch offices in different region
Lab 6	Concept of network IP address	CO1, CO2, CO4	Network devices configurations	Prepare a report on IP configuration
Lab 7	Midterm Exam CO2, CO4			
Lab 8	FTP server configuration	CO1, CO2, CO4	Network devices configurations	Prepare a report on FTP server configuration
Lab 9	Mail server (SMTP) configuration	CO1, CO2, CO4	Network devices configurations	Prepare a report on SMTP server configuration
Lab 10	RIP and RIPV2 configuration	CO2, CO3, CO4	Distance vector routing protocol	Implement the designed network in Packet Tracer simulation
Lab 11	SSL Configuration	CO1, CO4	SSL	Prepare a report on SSL configuration
Lab 12	Creating client and server in Java	CO1, CO4	Client-server programming (socket programming)	Lab Report on communication between client and server
Lab 13	IoT simulation	CO2, CO3, CO4	IoT technology	

Lab 14	Project presentation and Final exam Evaluation	CO5		Project show, presentation and viva
Semester Final Exam CO2, CO4				

Required Reference(s): Computer Networking A Top-Down Approach (CNA) - *James F. Kurose*

Recommended Reference(s): Computer Networks - *ANDREW S. TANENBAUM*

Simulation Tool(s):

1. **Cisco Packet Tracer**
2. **XAMPP**
3. **NGROK**
4. **Network Simulator (NS3)**
5. **Matlab Simulink**

Special Instructions:

- Minimum Required Attendance: 70% class attendance is mandatory for a student in order to appear at the final examination.
- Late presence: Consecutive two days late presence in the class will be counted as one day absent
- Assignment submission rules: Have to submit before the midnight of the submission date through email.

Prepared by	Checked by	Approved by
Sk. Tanzir Mehedi	Chairman, PSAC committee	Head of the Department

Appendix-1:

Washington Accord Program Outcomes (PO) for engineering programs:

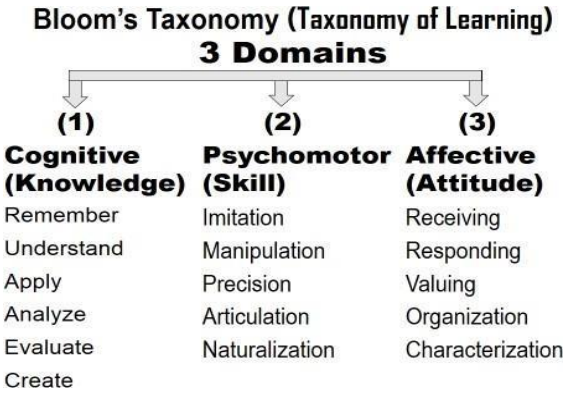
No.	PO	Differentiating Characteristic
1	Engineering Knowledge	Breadth and depth of education and type of knowledge, both theoretical and practical
2	Problem Analysis	Complexity of analysis
3	Design/ development of solutions	Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified
4	Investigation	Breadth and depth of investigation and experimentation
5	Modern Tool Usage	Level of understanding of the appropriateness of the tool
6	The Engineer and Society	Level of knowledge and responsibility
7	Environment and Sustainability	Type of solutions.
8	Ethics	Understanding and level of practice
9	Individual and Team work	Role in and diversity of team
10	Communication	Level of communication according to type of activities performed
11	Project Management and Finance	Level of management required for differing types of activity
12	Lifelong learning	Preparation for and depth of Continuing learning.

Generic Skills (Detailed):

1. **Engineering Knowledge (T)** -Apply knowledge of mathematics, sciences, engineering fundamentals and manufacturing engineering to the solution of complex engineering problems;
2. **Problem Analysis (T)** – Identify, formulate, research relevant literature and analyze complex engineering problems, and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences;
3. **Design/Development of Solutions (A)** –Design solutions, exhibiting innovativeness, for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues.
4. **Investigation (D)** Conduct investigation into complex problems, displaying creativeness, using research-based knowledge, and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions;
5. **Modern Tool Usage (A & D)** -Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations;
6. **The Engineer and Society (ESSE)** -Apply reasoning based on contextual knowledge to assess societal, health, safety, legal, cultural, contemporary issues, and the consequent responsibilities relevant to professional engineering practices.
7. **Environment and Sustainability (ESSE)** -Understand the impact of professional engineering solutions in societal, global, and environmental contexts and demonstrate knowledge of and need for sustainable development;

8. **Ethics (ESSE)** –Apply professional ethics with Islamic values and commit to responsibilities and norms of professional engineering code of practices.
9. **Communication (S)** -Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
10. **Individual and Team Work (S)** -Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
11. **Life Long Learning (S)** -Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
12. **Project Management and Finance (S)** -Demonstrate knowledge and understanding of engineering management and financial principles and apply these to one's own work, as a member and/or leader in a team, to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship.

Appendix-2: Bloom's Taxonomy



Appendix-3: Grading Policy

Numeric Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00