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** 2020
Level:	3-2 (All sections)
Credit Hour:	1.50
Name & Designation of Teachers:	Dr. A S M Touhidul Hasan, Assistant Professor
Office/Room:	
Class Hours:	**Sunday** (2:00-4:50) PM, *Sec A2* **Tuesday** (9:30-10:50) AM, *Sec B1*; **Wednesday** (2:00-4:50) PM, *Sec A2*
Consultation Hours:	
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Mobile:	+8801819698279 (Touhid),
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	1	1/Apply	Live Video Lecture and Live simulation	Online Quiz, Time-bound network configuration exam on simulator, Oral Exam
CO2	**Implement** the concept of routing protocols and its application in corporate network, VLAN	2	1/Apply	Live Video Lecture and Live simulation	Online 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	Live Video Lecture and Live simulation	Online 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	Live Video Lecture and Live simulation	Online Quiz, Timebound network configuration exam on simulator, Oral Exam
CO5	**Design** a project based on networking ideas to solve real-life problems.	9,10	1/Create	Live Video Lecture and 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%**		15		15	
Mid Term will be based on time-bound network configuration exam and oral exam	**30%**		20		10	
Class Performance includes daily task completion, and assignment submission	**20%**	10		10		
Project and weekly evaluation	**20%**					20
Total	**100%**	10	35	10	25	20

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
Class 1	Introduction to Networking and the Internet	CO1	TCP/IP Protocol	Prepare a report on applications of Internet
Class 2	Creating client and server in python/java	CO1, CO4	Client-server programming	Create a chat application

Class 3	Introducing LAN cables, connectors, cable tester, crimping tools, and preparing cross-over and straight cable for a LAN	CO1	Cross-over and straight cable configuration	
Class 4	Project Discussion	CO5	Networking and related articles	Prepare project proposal
Class 5	Configuring Local Area Network, IPV4 VLSM calculation, Static Routing	CO1, CO2, CO4	IPV4 class full addressing	Designing a corporate network with branch offices in different region
Class 6	Introduce network devices, i.e., Router, Switch	CO1, CO2, CO4	Network devices configurations	
Class 7	Midterm Exam CO2, CO4			
Class 8	RIP and RIPV2 configuration	CO2, CO3, CO4	Distance vector routing protocol	Implement the designed network in Packet tracer simulation
Class 9	EIGRP	CO2, CO3, CO4	Link state routing protocol	
Class 10	OSPF	CO2, CO3, CO4	OSPF and Multi-access network	
Class 11	Layer 2 switching, ACL	CO2, CO3, CO4	VLAN, Access control list, firewall	Write the ACL lists for the designed network
Class 12	IoT simulation	CO2, CO3, CO4		
Class 13	Project	CO5		Project show, presentation and

	Evaluation			viva
Class 14	Semester Final Exam CO2, CO4			

Required Reference(s): **(1)** Computer Networking A Top-Down Approach (CNA)
- *James F. Kurose*

Recommended Reference(s): **(1)** Computer Networks
- *ANDREW S. TANENBAUM*

Simulation Tool(s): **(1) Cisco Packet Tracer**
(2) Network Simulator (NS3)
(3) 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
Course Teacher	Chairman, PSAC committee	Head of the Department

Appendix-1:
Washington Accord Program Outcomes (PO) for engineering programs:

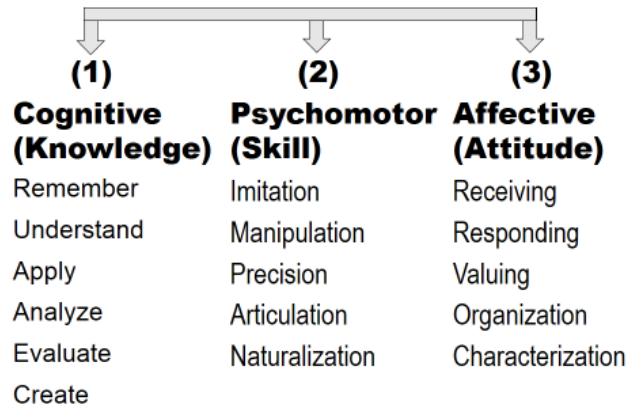| No.	PO	Differentiating Characteristic
1	Engineering Knowledge	Breadth and depth of education and type of knowledge, both theoretical and practical
2	Problem Analysis	Complexity of analysis
3	Design/ development of solutions	Breadth and uniqueness of engineering problems i.e. the extent to which problems 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 (Taxonomy of Learning)
3 Domains

(1) Cognitive (Knowledge)	(2) Psychomotor (Skill)	(3) Affective (Attitude)
Remember	Imitation	Receiving
Understand	Manipulation	Responding
Apply	Precision	Valuing
Analyze	Articulation	Organization
Evaluate	Naturalization	Characterization
Create		

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