**Course Outline**

**Course: SWE 411 (Computer Networks with Lab)**

**Teaching Staff:**

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| --- | --- |
| **Category** | **Description** |
| Corse Teacher with Section and Semester | Md. Fahad Bin Zamal; Sec: (A,B) Summer-2019 |
| Course Code | SWE 411 |
| Title | Computer Networks with Lab |
| Credit | 4 |
| Total Cr. Hour | 9 |
| Class room | 601AB, 605AB |
| Class time | TBA |
| Office Hour | TBA |
| Counseling Hour | TBA |
| Email | fahad.swe@diu.edu.bd |
| Google Classroom Code | A: ngzpq2 ; B: in0cmk; D: zz8bqd |

**Course Objectives (CO’s):**

1. The students will learn the basic concept of computer network.
2. The students will learn how computer network constructed in each layer of TCP/IP protocol.
3. The students will learn different kinds of guided media as a part of physical layer.
4. The students will learn how to make Ethernet cable and will able to use it to data share.
5. The students will learn the Error Detection mechanism to understand the responsibility of data link layer.
6. The students will learn the concept of IP address, subnetting, VLSM, CIDR and different types of routing algorithm as a part of network layer.
7. The students will learn the concept of TCP and UDP protocol to understand transport layer.
8. The students will learn different application layer protocol to understand its functionality.

**Prerequisite:** Data Communication

**Learning Outcomes (LO’s):**

|  |  |
| --- | --- |
| No. | Outcomes (LO’s) |
| **Knowledge** | |
| 1 | Understand communication architecture, protocol, data representation and data flow. |
| 2 | Understand how network devices works when we use our device to communicate with each other. |
| 3 | Understand how different protocol runs to establish network. |
| **Skill** | |
| 4 | They will able to describe how one message goes from one device to other by the set up of computer network. |
| 5 | To be able to make Ethernet cable and by using it share contents between devices. |
| 6 | To be able to create messaging application by using socket programming |
| **Self Development** | |
| 7 | To be able to take decision that which topology is best for a specific network. |
| 8 | To be able to create virtual network by using different network algorithm |
| **Role in Context** | |
| 9 | Inspire others to study and involved in job sector in the field of computer network |
| **Attitude** | |
| 10 | To be able to be confident about network structure, protocol, algorithm and will be ready to set career as a network engineer. |

**Course Description:**

Data Communication course will help student to understand how data goes from one device to another device. Its helps to understand how our data became information and goes through a transmission media as a signal. This course contains how our devices are detected by IP address and how we use one IP address to many more users. This course helps to know how our signal is affected by noise and how to minimize it. Overall this course helps to know total communication architecture between two or more devices.

**Course Methodology:**

1. Class size of 35-40 Students
2. Classroom with a projector, a computer and a white marker board
3. Industrial visit may be required for the course at the end of the semester
4. Students may need to attend workshop during the turner of the course

**Assessment:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Assessment Methods | Weighing | | | Remarks |
| 1 | Continuous Assessment | 35% | 5% | Attendance | To measure how well students have learned throughout the semester. |
| 15% | Quiz (Min 4 Quizzes) |
| 5% | Presentation |
| 5% | Assignment |
|  |  |  | 5% | Google Classroom |  |
|  | | | | | |
| 2 | Examinations | 65% | 25% | MID term exam | To measure how far students have achieved the learning outcomes. |
| 40% | Final Exam |

**Mapping of Assessment with Learning Outcomes (LO’s):**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Learning Outcome | Course Assessment Methods | | | | | |
| (LO’S) | | Attendance | Quiz | Presentation | Assignment | MID | FINAL |
| 1 | Understand communication architecture, protocol, data representation and data flow. | x | x | x |  | x |  |
| 2 | Understand how our device works when we use our device to communicate with each other. | x | x | x |  | x |  |
| 3 | Understand signal conversion and layers for standard communication. | x | x | x | x | x |  |
| 4 | To be able to understand how our message go from my device to my desired destination through the internet. | x | x | x | x | x | x |
| 5 | To be able to understand how our device converts our data into signal and vice versa. | x | x | x |  | x | x |
| 6 | To be able to do sub-netting. | x | x | x | x | x |  |
| 7 | To be able to take decision that which topology is best for a specific network. |  |  |  |  |  |  |
| 8 | To be able to decide which data flow we should use to communicate in a specific case. | x | x | x | x | x |  |
| 9 | To be able to decide which data flow and topology is best for a specific context. | x | x | x |  | x |  |
| 10 | To be able to be confident about internet connection, dish connection, mobile communication or wireless communication is takes place. | x | x | x |  | x | x |

**Rubrics:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Weighing | Letter Grade | Category | Description |
| 1 | 80% | A+ | Outstanding | Very Strong evidence of having achieved all the LO’s and demonstration of exceptional mastery of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 2 | 75% | A | Excellent | Strong evidence of having achieved all the LO’s and demonstration of mastery of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 3 | 70% | A- | Very Good | Evidence of having achieved 90% of the LO’s with good understanding of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 4 | 65% | B+ | Good | Evidence of having achieved 80% of the LO’s with understanding of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 5 | 60% | B | Satisfactory | Evidence of having achieved 70% of the LO’s with basic understanding of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 6 | 55% | B- | Above Average | Evidence of having achieved 60% of the LO’s with minimal understanding of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 7 | 50% | C+ | Average | Evidence of having achieved 50% of the LO’s with minimal understanding of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 8 | 45% | C | Below Average | Evidence of having achieved 40% of the LO’s with minimal understanding of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 9 | 40% | D | Pass | Evidence of having achieved 30% of the LO’s with little understanding of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |
| 10 | <40 | F | Fail | Evidence of having achieved below 30% of the LO’s with very little understanding of data communication knowledge and skills.  Able to do sub netting, understand communication architecture, develop correct topology to specific cases, Understand OSI layers, know specific data conversion process. |

**Teaching Method (TM):**

|  |  |  |  |
| --- | --- | --- | --- |
| No. | **Method Name** | **Description** | **Medium Used** |
|  | **Authority, or lecture style** | This traditional, formal approach to teaching is sometimes referred to as “the sage on the stage.” | **white board, marker** |
|  | **Demonstrator, or coach style** | This style retains the formal authority role while allowing teachers to demonstrate their expertise by showing students what they need to learn | **use projector, PC, presenter** |
|  | **Facilitator, or activity style** | This approach encourages teachers to function as advisors who help students learn by doing. | **Use VIP card, Marker, provide sheet** |
|  | **Developer, or group style** | This style allows teachers to guide students in a group setting to accomplish tasks and learn what works or doesn’t. | **use card and poster and presentation in a group** |
|  | **Hybrid, or blended style** | This approach incorporates different aspects of the various styles and gives teachers flexibility to tailor a personal style that’s right for their coursework and students | **use multiple approaches together** |
|  | **Virtual Learning** | Use Google classroom or Learning feedback system to provide distant learning to students. | **Use internet, computer network, web site** |

**Mapping of Lesson plan to the Learning Outcomes and Teaching Methods:**

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| --- | --- | --- | --- | --- |
| No. | Session | Topic/ Content | Teaching Method  (TM) | Learning Outcomes (LO’s) |
| 1 | Session 1 | **Course Objective**  **Class 1:** Discuss course objectives, grading policies, etc. **Class 2:** Introduction of computer networks | 4 | 1 |
| 2 | Session 2 | **Physical Layer**  **Class 1:** Making own Ethernet Cable  **Class 2:** Hub, Switch, Router | 1, 2 | 1, 2 |
| 3 | Session 3 | **Application Layer**  **Class 1:** Web, HTTP  **Class 2:** FTP, DNS | 1, 2,5 | 6,7,9,10 |
| 4 | Session 4 | **Application Layer**  **Class 1:** Socket Programming  **Class 2:** Socket Programming | 1, 2,6 | 1,2,3,7,10 |
| 5 | Session 5 | **Transport Layer**  **Class 1:** TCP & UDP  **Class 2:** TCP & UDP | 1, 2,6 | 1,2,3,7,10 |
| 6 | Session 6 | **Network Layer**  **Class 1:** Basics of IP Address  **Class 2:** Subnet | 1, 2,3 | 6 |
| 7 | Session 7 | **Network Layer**  **Class 1:** Subnet  **Class 2:** FLSM | 1,2,3,4,5,6 | 1,2,3,6,7,9,10 |
| 8 | Session 8 | **Network Layer**  **Class 1:** VLSM  **Class 2:** CIDR | 1, 2,4 | 4,5 |
| 9 | Session 9 | **Network Layer**  **Class 1:** RIP  **Class 2:** RIP | 1, 2,4 | 4,5 |
| 10 | Session 10 | **Data Link Layer**  **Class 1:** Error Detection  **Class 2:** Single Parity, Double Parity | 1, 2,5 | 1,2,8 |
| 11 | Session 11 | **Data Link Layer**  **Class 1:** Error Detection  **Class 2:** Checksum, CRC | 1, 2,5 | 2,8 |
| 12 | Session 12 | **Physical Layer**  **Class 1:** Topology  **Class 2:** Data analysis | 1, 2,4 | 2,8 |
| 13 | Session 13 | Review for Final Exam | 1,2,4,5 | 1,2,4,5,7,8 |

**Reference:**

1. Computer Network: A Top Down Approach, Kurose Ross
2. Data Communication and Networking By Forouzan

**Disclaimer:**

While every effort has been made to ensure that the information contained in this document is accurate, the information is subject to change. Changes will be notified in class and/or tutorials, via Google Classroom or email. Students are encouraged to check Google Classroom or email for any changes. It is your responsibility to be informed.