

**Institute of Technology of Cambodia**

**Information and Communication Engineering**

**Syllabus of Course**

**Networks I**

**Year 2023-2024**

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| **Course Information** |

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| Course: Networks I | Course’s Code: GICI41RES |
| Semester: 1, Year: 4 | Number of Credit: 1.5 |
| Instructor’s name: Mr. NOP Phearum | Latest Degree Obtained: Master |
| Pre-requisites | Introduction to Computer Systems and Networks |
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1. **Course Description**

This course designed to equip students with the essential skills and knowledge needed to effectively configure and troubleshoot routers and switches in a network environment. The course offers a blend of theoretical understanding and practical experience, focusing on the fundamental aspects of network architecture, operation, and management. Students will engage in hands-on labs to apply concepts such as network configuration, protocol implementation, and network services management. Ideal for aspiring network professionals, this course lays the groundwork for advanced studies in network administration and engineering.

1. **Course Learning Outcomes (CLOs)**

Upon completing this course, students will be able to

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| --- | --- | --- | --- |
| No | Course Learning Outputs (CLOs) | PLOs | Bloom’s taxonomy |
| CLO1 | Understand and explain fundamental networking concepts and network protocol | PLO1, PLO2, PLO3 | Remembering, Understanding,  Applying, |
| CLO2 | Configure, Manage, and Troubleshoot Network Infrastructure | PLO3, PLO8, PLO9 | Applying, Analyzing,  Evaluating, |
| CLO3 | Analyze, Design, and Evaluate Network Solutions | PLO3, PLO4, PLO5 | Analyzing, Evaluating, Creating |

1. **Teaching Approaches**

* Give Lecture
* Practice tutorial
* Make group discussion and Presentation
* Give homework
* Give project/Assignment
* Have Quiz

1. **Assessment Policy**

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| --- | --- | --- | --- |
| **No** | **Assessment Task** | **Weighting (%)** | **Responded Course Learning Outcomes** |
| 1 | Attendance | 10 |  |
| 2 | Class Activities and Quiz | 10 | CLO1, CL02, CLO3 |
| 3 | Assignment/Report and Presentation | 10 | CLO1, CL02, CLO3 |
| 4 | Midterm | 30 | CLO1, CL02, CLO3 |
| 5 | Final | 40 | CL01, CLO2, CLO3 |

1. **Grading and Evaluation Criterion**

To pass this subject, student need to

* Get total score of at least 30 (in 100) if the average score more than 50%
* Get total score of at least 50 (in 100) if the average score lower than 50%
* Otherwise, it will be judged by the jury of the department.

1. **Details of Contents, CLOs, LLOs, Teaching and Learning Activities, Assessment, and Supported Materials**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Weeks** | **Session (h)** | **CLOs** | **LLOs** | **Content** | **Teaching Activities** | **Learning Activities** | **Assessment** | **Materials** |
| 1 | 1-4 | CLO1  CLO2 | * Explain the historical development of computer networks and key milestones in network technology. * Identify and describe different types of networks (LAN, WAN, PAN, etc.). * Explain the function and importance of various network topologies and devices. * Demonstrate basic network setup and connectivity troubleshooting. | Lecture 1: Introduction to Computer Networking | * Lecture Presentation * Tutorials Practice * Class Facilitating * Case Study * Q&A | * Listen and Note Taking * Indiviudal Homework * Group Discussion and Presentation * Report/Project Presentation * Q&A | * Attendance * Class Activities * Formative Assement * Q&A | * Slide Presentation * LCD Projector * Laptop * Slide Pointer * Writting Board |
| 2 | 5-8 | CLO1 | * Outline the layers of the OSI and TCP/IP models and describe the functions of each layer. * Apply packet analysis tools to trace data packets through each layer of the models. * Understand encryption and decryption. | Lecture 2: OSI and TCP/IP Model | * Lecture Presentation * Tutorials Practice * Class Facilitating * Case Study * Q&A | * Listen and Note Taking * Indiviudal Homework * Group Discussion and Presentation * Report/Project Presentation * Q&A | * Attendance * Class Activities * Formative Assement * Q&A | * Slide Presentation * LCD Projector * Laptop * Slide Pointer * Writting Board |
| 3 | 9-12 | CLO2 | * Configure basic switch settings and VLAN setups. * Understand the operational mechanisms of network switches. * Analyze and resolve VLAN and switch configuration issues. | Lecture 3: Switching | * Lecture Presentation * Tutorials Practice * Class Facilitating * Case Study * Q&A | * Listen and Note Taking * Indiviudal Homework * Group Discussion and Presentation * Report/Project Presentation * Q&A | * Attendance * Class Activities * Formative Assement * Quiz and Q&A | * Slide Presentation * LCD Projector * Laptop * Slide Pointer * Writting Board |
| 4 | 13-16 | CLO2 | * Explain switching concepts such as STP * Implement VLAN trunking * Troubleshoot common problems related to network segmentation and switching. | Lecture 4: Switching | * Lecture Presentation * Tutorials Practice * Class Facilitating * Case Study * Q&A | * Listen and Note Taking * Indiviudal Homework * Group Discussion and Presentation * Report/Project Presentation * Q&A | * Attendance * Class Activities * Formative Assement * Q&A | * Slide Presentation * LCD Projector * Laptop * Slide Pointer * Writting Board |
| 5 | 17-18 |  | Midterm Exam |  |  |  |  |  |
| 5-6 | 19-22 | CLO2  CLO3 | * Perform basic router configurations and troubleshoot routing issues. * Configure static and dynamic routing protocols including RIPv1 and RIPng. * Evaluate the effectiveness of different routing protocols for specific network scenarios. | Lecture 5: Routing | * Lecture Presentation * Tutorials Practice * Class Facilitating * Case Study * Q&A | * Listen and Note Taking * Indiviudal Homework * Group Discussion and Presentation * Report/Project Presentation * Q&A | * Attendance * Class Activities * Formative Assement * Q&A | * Slide Presentation * LCD Projector * Laptop * Slide Pointer * Writting Board |
| 6-7 | 23-26 | CLO2 CLO3 | * Understand and apply routing concepts to optimize network traffic and performance. * Implement OSPF in both single and multi-area networks. * Configure and troubleshoot inter-VLAN routing, emphasizing the setup of router-on-a-stick and Layer 3 switch configurations. | Lecture 6: Routing | * Lecture Presentation * Tutorials Practice * Class Facilitating * Case Study * Q&A | * Listen and Note Taking * Indiviudal Homework * Group Discussion and Presentation * Report/Project Presentation * Q&A | * Attendance * Class Activities * Formative Assement * Quiz and Q&A | * Slide Presentation * LCD Projector * Laptop * Slide Pointer * Writting Board |
| 7-8 | 27-30 | CLO1  CLO2  CLO3 | * Configure and manage DHCP servers to dynamically assign IP addresses. * Set up and manage DNS servers for effective domain name resolution. * Diagnose and resolve common DHCP and DNS configuration issues. | Lecture 7: DHCP and DNS Servers | * Lecture Presentation * Tutorials Practice * Class Facilitating * Case Study   Q&A | * Listen and Note Taking * Indiviudal Homework * Group Discussion and Presentation * Report/Project Presentation   Q&A | * Attendance * Class Activities * Formative Assement * Q&A * Mini project | * Slide Presentation * LCD Projector * Laptop * Slide Pointer * Writting Board |
| 8 | 31-32 |  | Final Exam | | | | | |

1. **Internal Regulation Related to Students’ Learning and Assessment**

To preserve the learning good environment in our classrooms, students are expected to adhere to the following rules:

* Students are expected to come to class punctually and regularly. Punctuality reflects that you are ready and willing to undertake the task at hand and are respectful of others involved. If you are late, please come in quietly and take a seat in the back of the room.
* Treat everyone in the classroom with respect and be tolerant of questions asked by fellow classmates. This is a diverse community, and we need to respect each other’s differences.
* Be respectful when engaging in online discourse.
* Pay attention and participate actively in classroom conversation. Participation in class discussion is highly encouraged.
* Refrain from talking to other students during class or interrupting others. No “sidebars.”
* Come to class prepared: always have your assignments, textbook, notebook, and pen.
* If you must leave during class, exit and re-enter as quietly as possible.
* Do not leave class during exam sessions.
* Do not litter in the classroom. Clean up around your desk before you leave.
* Wait until class has ended before you pack up your bags

1. **References**

**Main Books**

* J. F. Kurose and K. W. Ross, Computer Networking: A Top-down Approach. Noida, Uttar Predesh, India: Pearson India Education Services Pvt. Ltd., 2022.
* T. McMillan, Cisco Networking Essentials. Sybex, 2015.

**Remark: This syllabus is intended to provide guidance on students’ and the instructor’s obligations for this course and to outline topics to be covered during the semester.** However, the instructor reserves the right to modify syllabus items as needs arise. Students will be notified of any changes.