Computer Network

Module name	Computer Network	
Module level	Undergraduate	
Code	IF221116	
Courses (if applicable)	Computer Network	
Semester	4	
Lecturer	Yisti Vita Via, S.ST, M.Kom (PIC) Achmad Junaidi, S.Kom, M.Kom Chrystia Aji Putra, S.Kom, M.T Henni Endah Wahanani, S.T, M.Kom	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program; compulsory; 4th semester	
Type of teaching, contact hours	Lectures, < 60 students	
Teaching Methods	Simulation, case study, collaborative learning, project-based learning, problem-based learning	
Workload	1. Lectures: 3 sks x 50 = 150 minutes (2 hours 30 minutes) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week	
Credit points	3 credit points (sks)	
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.	
Mandatory prerequisites	Operating System	
Courses description	In this course, students learn how computer communication works. Student will also study how data can be transmitted from one computer to another is based on the OSI Layer and TCP/IP reference model, network devices, cable types, IP addressing, subnetting, routing protocols (Static and Dynamic Routing), Virtual Local Area Networks (VLAN), and IP management.	
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to:	
	CO1 Students are able to describe the history of computer networks, understand how the communication inter-computer, and are able to identify network devices and diagnose performance issues. (C1, C2, C3, C5)	PLO3
	CO2 Students are able to perform subnetting and configuration on networks. (C2, C3, C4, P2)	PLO3
	CO3 Students are able to identify routing concepts, approach how routing concepts work, and configure them in networks. (C1, C2, P2)	PLO3
	CO4 Students are able to conceptualize VLANs and design IP management within networks across various case studies. (C3, C6, P2, P4, P5, A2)	PLO3
Content	The topics covered in this course include: the history of computer networks, the impact of computer networks on human life, computer network equipment/components, transmission media, network performance (loss, delay, jitter, throughput, loss calculation, delay, jitter, throughput), OSI Reference Model, TCP/IP Reference Model, the role of protocols in computer networks, the functions of each layer in the OSI and TCP/IP models, the advantages of the OSI and TCP/IP reference models on a per-layer basis, binary and hexadecimal	

	numbering, Private and Public IP addresses, addressing schemes, introduction to IP versions 4 and 6 (IPv4 and IPv6), fundamentals of subnetting, comparison of classful and classless addressing, subnetting terminology, network address, broadcast address, usable host addressing, subnetting for Class A, B, and C, concepts and mechanisms of routing in computer networks, introduction to different types of routing protocols, static routing concept in computer networks, dynamic routing concept in computer networks, types of dynamic routing protocols, Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), VLAN principles, VLAN configuration, maintenance, and troubleshooting, routing principles, subnetting, and determination of the number of hosts in a network.
Media employed	LCD, whiteboard, websites, books (as references), online meeting, etc.
Assessments and Evaluation	One written Midterm assessment (60 minutes) and one final oral exam (30 minutes), two short computer-based quizzes, takehome written assignments
Study and examination requirements and forms of examination	The final grade in the module is composed of: • Two short computer-based quizzes: 15% x 2 = 30% • Take-home written assignments: 15% • Written Midterm assessment: 25% • Final oral exam: 30% Students must have a final grade of 55.6% or higher to pass.
Reading List	• L. Peterson, B. S. Davie, Computer Networks: A Systems Approach, Six Edition. Morgan Kaufman, 2021. • J. Kurose, K. Ross, Computer Networking: A TopDown Approach, 8th edition. Pearson, 2021. • A. Elahi, A. Cushman, Computer Networks - Data Communications, Internet and Security. Springer, 2024. • A. K. Rangisetti, Future Networking Essentials: A Practical Guide for Exploring Cloud, Edge, and 5G core Networking Environments. Apress, 2024. • R. Herrero, Practical Internet of Things Networking: Understanding IoT Layered Architecture. Springer, 2023. • Qaiser, Zeeshan, Computer networking. Toronto Academic Press, 2021. ISBN: 9781774697559. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/ARCLER0001558?searchid=1754979127599Cu6OjaEjIsi5cNtCfmjtX • Zhang, Hong, Topological structure of road networks : models and computation methods. World Scientific, 2024. ISBN: 9789811294259. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/WSPCB0011827?searchid=1754979127599Cu6OjaEjIsi5cNtCfmjtX • Jaswal, Nipun, Mastering Network Forensics : A practical approach to investigating and defending against network attacks. BPB Publications, 2024. ISBN: 9789355516206. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/BPB0000565?searchid=1754979127599Cu6OjaEjIsi5cNtCfmjtX • Wilson, Kevin, Exploring computer hardware: the illustrated guide to understanding computer hardware, components, peripherals & networks, 2024 edition. Packt Publishing, 2024. ISBN: 9781836649748. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/PACKT0007516?searchid=1754979127599Cu6OjaEjIsi5cNtCfmjtX • Singh, Brahampal, Data communication and networking : understanding network architecture, design, and management. BPB Publications, 2024. ISBN:

	9789355517487. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/BPB0000639?searchid=1754979785805M8HBJK4umnBOIlFhLxhjp • Brooks, T. Tyson, Cloud to edgeware : wireless grid applications, architecture and security for the internet of things. World Scientific, 2024. ISBN: 9789814630801. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/WSPCB0011634?searchid=1754982193478O0PGUCVINwpsLCy~KiYge