## Module Description

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| **Module name** | Computer Network |
| **Module level, if applicable** | Bachelor of Informatics |
| **Code, if applicable** | 21D12121403 |
| **Subtitle, if applicable** | - |
| **Course, if applicable** | - |
| **Semester(s) in which the module is taught** | 4th |
| **Person responsible for the module** | Dr.Eng.Ir. Muhammad Niswar, ST., M.InfoTech |
| **Lecturer** | Dr.Eng. Ir. Muhammad Niswar, ST., M.InfoTech<br>Dr. Eng. Ady Wahyudi Paundu., ST., MT<br>Dr. Eng. Zulkifli Tahir., ST., MT |
| **Language** | Indonesian Language [Bahasa Indonesia] |
| **Relation to Curriculum** | This course is a compulsory course and offered in the 4th semester. |
| **Type of teaching, contact hours** | Teaching methods: [group discussion], [simulation], [collaborative learning], [problem-based learning].<br><br>Teaching forms: [lecture], [tutorial], [practicum].<br><br>CH : 08.00 - 16.00 |
| **Workload** | For this course, students are required to meet a minimum of 136.00 hours in one semester, which consist of:<br>- 40.00 hours for lecture,<br>- 48.00 hours for structured assignments,<br>- 48.00 hours for private study |
| **Credit points** | 3 credit points (equivalent with 5.1 ECTS) |

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| **Requirements according to the examination regulations** | Students have participated in at least 80% of the learning activities (Academic Regulations, Chapter VII) |
| **Recommended prerequisites** | Digital System |
| **Module objectives/intended learning outcomes** | After completing the course, Students are able:<br><br>**Intended Learning Outcomes (ILO):**<br>**ILO 1 :** Have the knowledge of fundamental in Computing Science that includes basic theory and concepts of computer science, Mathematics and Statistics, Programming Algorithm, Software Engineering, Information Management and Digital Resilience, also the advance topics of either Artificial Intelligence, Data Science, Computer Network, Cloud Computing or Internet of Things<br>**ILO 4 :** Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements by applying computer science theory and software development fundamentals.<br>**ILO 7 :** Perform a logical systematic procedure to solve problems, then communicate their ideas in a convincing and effective manner, either in written or orally, to propose solutions.<br><br>**Course Learning Objective (CLO):**<br>After completing this course, students should be able to understand how the computer networks work and design a small-scale computer network.<br><br>**Sub CLO :**<br>ILO 1 => CLO 1 :Students should be able to explain and understand how computer networks work, TCP/IP Protocol layers and service model<br>ILO 4 => CLO 2 : Students should be able to design and implement a small scale computer network.<br>ILO 7 => CLO 3 :Students should be able to complete the network design assignment, meet a given set of requirements and present the result to lecturer and other students. |
| **Content** | Students will learn about :<br>1. Internet History, Network Protocols layers and service models in computer networks: OSI and TCP/IP model |

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| | 2. Circuit vs. Packet Switching, Network Performance Metrics<br>3. Application Layer Protocol: HTTP, SMTP, FTP, TELNET, DNS<br>4. Transport Layer Protocol: TCP and UDP<br>5. Transport Layer Protocol: Socket Programming<br>6. Network Layer Protocol: IP Addressing & Subnetting<br>7. Network Layer Protocol: Routing Protocol (RIP, OSPF, EIGRP, BGP)<br>8. Link Layer Protocol: Error detection. Multiple access protocols. IEEE 802.3 Ethernet.<br>9. Link Layer Protocol: Switching Protocol (STP, RSTP)<br>10. Link Layer Protocol: VLAN<br>11. Network Security<br>12. Brief Overview of Advanced Networking: SDN and IoT |
| **Forms of Assessment** | Assessment techniques: [observation], [participation], [written test].<br><br>Assessment forms: [final term exam], [assignment], [presentation].<br><br>Quizzes & Final term exam = 40%, Assignment = 50%, Presentation = 10%<br><br>CLO 1 => ILO 1: 70% (Quizzes & Final term exam: written test)<br>CLO 2 => ILO 4: 20% (Assignment: participation)<br>CLO 3 => ILO 7: 10% (Presentation: observation) |
| **Study and examination requirements and forms of examination** | **Study and examination requirements:**<br>- Students must attend 15 minutes before the class starts.<br>- Students must switch off all electronic devices.<br>- Students must inform the lecturer if they will not attend the class due to sickness, etc.<br>- Students must submit all class assignments before the deadline.<br>- Students must attend the exam to get a final grade.<br>**Form of examination:**<br>Written exam: Essay |
| **Media employed** | Video conference, slide presentation, Learning Management System (LMS). |
| **Reading list** | **Main :**<br>1. Andrew S. Tanenbaum, David J. Wetherall, 2011, Computer Networks, 5th edition, Prentice Hall. |

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| | 2. Tod Lammie, 2007, CCNA: Cisco Certified Network Associate Study Guide, Wiley Publishing |