

Course Code	TKIE163101	
Course Name	Network and Data Communications	
Course Instructors	Sujoko Sumaryono; Wahyu Dewanto; I Wayan Mustika; Widyawan	
Course Type	Required	
Course Classification	Engineering Topics	
Credit / Contact Hour per Week	2 / 100 minutes per Week	
Course Description	After following this course students are expected to have sufficient principle to design, analyse, and configure the data network system to develop knowledge in this field independently.	
Prerequisites Courses	-	
Covered Student Outcome	Fundamental and Engineering Knowledge (a) Development of Engineering Solution (b) Modern Tools Utilization (e)	
Learning Outcome		
		Study Program Student Outcome
No	Learning Outcome	SO (a) - SO (k)
1.	Students are able to explain various aspects of data transmission and can use the concept of width and rapid field of data in transmitting signals.	Fundamental and Engineering Knowledge (a)
2.	Students are able to choose the data encoding technique that is appropriate with the signal transmission technique.	Fundamental and Engineering Knowledge (a)
3.	Students are able to explain and know how to overcome the emergence of errors in transmitting signals.	Fundamental and Engineering Knowledge (a)
4.	Students are able to compare routing techniques in data communications networks.	Modern Tools Utilization (e)
5.	Students are able to explain the network protocol and can compare 2 entity addressing techniques in the network.	Development of Engineering Solution (b)
Topic	<p>Topic 1 : Introduction</p> <ul style="list-style-type: none"> - Models of communication in general <p>Topic 2: Aspects in data transmission</p> <ul style="list-style-type: none"> - Concepts and terminology in data transmission - Transmission of digital and analog data - Media transmission and constraints - Bandwidth and data rate <p>Topic 3: Simple data encoding</p> <ul style="list-style-type: none"> - Encoding of Digital data-digital signal - Encoding of digital data-analog signal - Encoding of analog data digital signal - Encoding of Analog-data analog signal <p>Topic 4: Digital data communication techniques</p> <ul style="list-style-type: none"> - Asynchronous and synchronous transmission - Error detection techniques - The interface and its process <p>Topic 5 : Full data path</p> <ul style="list-style-type: none"> - Network configuration and topology - Basic Flow control and Error control - Data path control protocol <p>Topic 6 : Multiplexing Process</p> <ul style="list-style-type: none"> - Frequency Division Multiplexing, Time Division, and Code Division <p>Topic 7: The basic network of data communications</p> <ul style="list-style-type: none"> - Network communication and various switching - Basics of Circuit switching and Packet Switching 	

	<ul style="list-style-type: none"> - Basics of Signaling in communication <p>Topic 8 : Basics of Local and Metropolitan Area Networks</p> <ul style="list-style-type: none"> - LAN / MAN technology - A wide range of network topologies and protocols - Media access control protocol <p>Topic 9 : Packet Switching in Networks)</p> <ul style="list-style-type: none"> - Characteristics and performance - Various Routing Techniques - Various Flow Control Techniques <p>Topic 10 : Network Protocols</p> <ul style="list-style-type: none"> - OSI Model Protocol and TCP / IP - X-25, Frame Relay and Cell Relay <p>Topic 11: Internetworking</p> <ul style="list-style-type: none"> - The principle of Internetworking - Network Connection Devices - Backbone Network and Virtual LAN <p>Topic 12 : Network Addressing</p> <ul style="list-style-type: none"> - IPv4 and IPv6 - Domain name system 												
Direct Assessment	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Direct Assessment Plan</th> <th style="text-align: left;">Measured Learning Outcome</th> </tr> </thead> <tbody> <tr> <td>Mid Exam</td> <td>LO1, LO3</td> </tr> <tr> <td>Final Exam</td> <td>LO3, LO4, LO5</td> </tr> <tr> <td>Quiz and assignment</td> <td>LO2, LO4</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Direct Assessment Plan	Measured Learning Outcome	Mid Exam	LO1, LO3	Final Exam	LO3, LO4, LO5	Quiz and assignment	LO2, LO4				
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Mid Exam	LO1, LO3												
Final Exam	LO3, LO4, LO5												
Quiz and assignment	LO2, LO4												
Indirect Assessment	Questionnaire and direct communication												
References	<p>[1] Stallings, W., 1994, Data and Computer Communications, 4th Edition, Prentice Hall. International Editions, Singapore</p> <p>[2] Forouzan, B.A., 2007, Data Communications and Networking, 4th Edition, McGraw Hill International Edition, Singapore</p>												