

Course Code	TKIT163106	
Course Name	Distributed System	
Course Instructors	Selo	
Course Type	Required	
Course Classification	Engineering Topics	
Credit / Contact Hour per Week	3 / 150 minutes per Week	
Course Description	Computer networks as distributed systems infrastructure, techniques and support in the management of distributed systems, and software and application components. Computer network material discusses generally about network components and how they work. Material engineering and distributed systems management support discusses distributed file systems, replication techniques, and transaction handling and concurrency. Topics of software and application components discuss the web as a distributed computing platform, interoperability issues, and examples of distributed computing architectures.	
Prerequisites Courses	-	
Covered Student Outcome	<b>Fundamental Engineering Knowledge (a)</b> <b>Development of Engineering Solution (b)</b> <b>Engineering Design (c)</b> <b>Modern Tools Utilization (e)</b>	
Learning Outcome		
		Study Program Student Outcome
No	Learning Outcome	SO (a) – SO (k)
1.	Students are able to explain about the notion of distributed computer system, its components, and its characteristics. Students can also provide examples of distributed systems in everyday life.	Fundamental Engineering Knowledge
2.	Students are able to explain the role and function of computer networks as distributed system infrastructure, including computer network components and how they work in providing support for applications running on it. Students can also explain about new technologies in computer networks such as wireless local networks and P2P networks.	Development of Engineering Solution
3.	Students are able to explain about primitive-primitive communication in distributed systems and how they work.	Fundamental Engineering Knowledge
4.	Students are able to design various implementation of distributed system in real world applications.	Engineering Design
5.	Student able to describe up-to-date technology of distributed system.	Modern Tools Utilization
6.		Choose an item.
Topic	1. Introduction to distributed systems <ul style="list-style-type: none"> <li>o Characteristics</li> <li>o Utilization</li> <li>o Examples</li> <li>o Trend and direction of development</li> </ul> 2. Computer network <ul style="list-style-type: none"> <li>• Variety of computer networks</li> <li>• Technology in computer networks</li> <li>• Protocols in computer networks</li> <li>• Addressing, switching, and routing mechanisms and operations</li> <li>• Wireless network and ad-hoc network</li> <li>• P2P and JXTA networks</li> </ul> 3. Primitive communication in distributed systems	

	<ul style="list-style-type: none"> <li>• Communication models</li> <li>• The client-server model</li> <li>• Inter-process communication (IPC)</li> <li>• Remote procedure call (RPC)</li> <li>• Remote method invocation (RMI)</li> </ul> <p>4. Distributed Components and Objects</p> <ul style="list-style-type: none"> <li>o Distributed Objects</li> <li>o Case study: CORBA</li> <li>o From Object to Component</li> </ul> <p>5. Web Services</p> <ul style="list-style-type: none"> <li>o Introduction</li> <li>o Service description</li> <li>o XML technology</li> </ul> <p>6. Security</p> <ul style="list-style-type: none"> <li>o Introduction</li> <li>o Cryptography</li> <li>o Digital Signatute</li> <li>o Public key</li> </ul> <p>7. Replication</p> <ul style="list-style-type: none"> <li>o Modeling and replication architecture</li> <li>o Coordination and ordering of messages</li> <li>o Fault tolerance</li> <li>o Replication techniques</li> </ul> <p>8. Transaction and concurrency</p> <ul style="list-style-type: none"> <li>o Transactions in a distributed system</li> <li>o Problems related to concurrency</li> <li>o Serial equivalence</li> <li>o Locking</li> </ul> <p>9. Fault Tolerance</p> <ul style="list-style-type: none"> <li>o Introduction</li> <li>o Resilience</li> <li>o Recovery</li> </ul> <p>10. Distributed File Systems</p> <ul style="list-style-type: none"> <li>o Introduction</li> <li>o File service architecture</li> <li>o Case Study</li> </ul> <p>11. Mobile Ubiquitos</p> <ul style="list-style-type: none"> <li>o Introduction</li> <li>o Interoperation</li> <li>o Sensing and context awareness</li> </ul> <p>12. Cloud Technology</p> <ul style="list-style-type: none"> <li>o Fundamentals</li> <li>o Architecture</li> <li>o Technology</li> </ul>								
<b>Direct Assesment</b>	<table border="1"> <thead> <tr> <th data-bbox="456 1745 891 1776"><b>Direct Assesment Plan</b></th> <th data-bbox="891 1745 1360 1776"><b>Measured Learning Outcome</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="456 1776 891 1808">Mid Exam</td> <td data-bbox="891 1776 1360 1808">LO1,LO2</td> </tr> <tr> <td data-bbox="456 1808 891 1839">Final Exam</td> <td data-bbox="891 1808 1360 1839">LO3,LO4,LO5</td> </tr> <tr> <td data-bbox="456 1839 891 1864"></td> <td data-bbox="891 1839 1360 1864"></td> </tr> </tbody> </table>	<b>Direct Assesment Plan</b>	<b>Measured Learning Outcome</b>	Mid Exam	LO1,LO2	Final Exam	LO3,LO4,LO5		
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Mid Exam	LO1,LO2								
Final Exam	LO3,LO4,LO5								
Indirect Assesment	Questionnaire and direct communication								

References	<ol style="list-style-type: none"><li>1. Coulouris, G., Dollimore, J., dan Kindberg, T. Distributed Systems: Concepts and Design. 5rd edition. Addison-Wesley, 2011.</li><li>2. Editors by Borko Furht ·Armando Escalante, Handbook of Cloud Computing , Springer</li><li>3. Andrew S Tanenbaum, Distributed Systems; Principle and Paradigms, 2005</li><li>4. Some sources from the Internet.</li></ol>
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