

ITEM	DETAILS	
1. Title of subject	WAN DESIGN AND PROTOCOLS	
2. Subject code	CSS202	
3. Status of subject	Major	
4. Stage	Year 2	
5. Credit Hour	4	
6. Pre-Requisite	CSS201 Advanced Router Configuration & Network Management	
7. Assessment	<b>Coursework : 50%</b> <b>Final Examination : 50%</b>	
8. Semester	Semester 2	
9. Objective of subject	To enable students to: Understand the concept of WAN design and various protocols used in a WAN.	
10. Synopsis of subject	Review, WAN (1), WAN (2), WAN Design, Point to Point Protocol, ISDN (1), ISDN (2), Frame Relay (1), Frame Relay (2), Network Management, Network + Certification Overview, CCNA Certification Preparation (1), CCNA Certification Preparation (2)	
11. Details of subject	<b>Contents</b>	<b>Hours</b>
Week 1 and 2	<b>Topic:</b> <b>1. Review</b> <ul style="list-style-type: none"> <li>• LAN Switching, LAN Design, ACLs, Routing</li> </ul> <b>2. WAN (1)</b> <ul style="list-style-type: none"> <li>• WAN Services, WAN Devices</li> </ul>	8
	<b>Learning Outcomes:</b> At the end of the lesson, students will be able to: <ul style="list-style-type: none"> <li>• Describe WAN standards.</li> <li>• Explain the WAN connection methods.</li> </ul>	

<p><b>Week 3 and 4</b></p>	<p><b>3. WAN (2)</b></p> <ul style="list-style-type: none"> <li>• WAN and OSI Model, WAN Encapsulation</li> <li>• WAN options</li> </ul> <p><b>4. WAN Design</b></p> <ul style="list-style-type: none"> <li>• WAN Design Issues</li> </ul> <p><b>Learning Outcomes:</b> At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand WAN data link protocols</li> <li>• Understand the WAN physical layer</li> </ul>	<p>8</p>
<p><b>Week 5 and Week 6</b></p>	<p><b>5. Point to Point Protocol</b></p> <ul style="list-style-type: none"> <li>• PPP, PPP Session Establishment, PPP Authentication</li> </ul> <p><b>6. ISDN (1)</b></p> <ul style="list-style-type: none"> <li>• ISDN and OSI Model</li> <li>• ISDN uses, ISDN Services</li> </ul> <p><b>Learning Outcomes:</b> At the end of the lessons, students will be able to :</p> <ul style="list-style-type: none"> <li>• Describe PPP encapsulation.</li> <li>• Configure PPP encapsulation.</li> </ul>	<p>8</p>
<p><b>Week 7 and Week 8</b></p>	<p><b>7. ISDN (2)</b></p> <ul style="list-style-type: none"> <li>• ISDN configuration, Dial on Demand Routing</li> </ul> <p><b>8. Frame Relay (1)</b></p> <ul style="list-style-type: none"> <li>• Frame Relay Technology</li> <li>• LMI, LMI features</li> </ul> <p><b>Learning Outcomes:</b> At the end of the lessons, students will be able to :</p> <ul style="list-style-type: none"> <li>• Describe and enable PPP multilink.</li> <li>• Understand Frame Relay standards and equipment.</li> </ul>	<p>8</p>
<p><b>Week 9 and Week 10</b></p>	<p><b>9. Frame Relay (2)</b></p> <ul style="list-style-type: none"> <li>• Frame Relay Subinterface</li> <li>• Basic Frame Relay Configuration</li> </ul> <p><b>10. Network Management</b></p> <ul style="list-style-type: none"> <li>• Network Administration, Monitoring, and Troubleshooting</li> </ul>	<p>8</p>

	<b>Learning Outcomes:</b> At the end of the lessons, students will be able to : <ul style="list-style-type: none"> <li>• Configure and monitor Frame Relay.</li> <li>• Manage the network, diagnose problem, prevent situations from occurring, and provide the best network performance possible for the users.</li> </ul>		
<b>Week 11 and Week 12</b>	<b>Activity:</b> Questions and Answers		8
<b>Week 13 and Week 14</b>	<b>11. CCNA Certification Preparation</b> <ul style="list-style-type: none"> <li>• Review CCNA examination questions</li> </ul> <b>12. Revision</b> <ul style="list-style-type: none"> <li>• Review CCNA examination questions</li> </ul>		8
	<b>Activity:</b> Questions and answers		
	<b>Total</b>		56
<b>12. Text</b>	<b>Compulsory</b>	Cisco Network Academy Program, CCNA semester 1 course material.	
	<b>Reference</b>	Caudle, K., & Cannon, K. (2004). <i>CCNA Guide to Cisco Networking..</i> (3 <sup>rd</sup> ed.). Thomson Course Technology	