

ITEM	DETAILS	
1. Title of subject	DATA COMMUNICATIONS & OPERATING SYSTEMS	
2. Subject code	STC206	
3. Status of subject	Core	
4. Stage	Year 2	
5. Credit Hour	4	
6. Pre-Requisite	None	
7. Assessment	<b>40% Coursework</b> 10% Test 1 10% Test 2 10% Assignment 1 10% Assignment 2  <b>60% Examination</b>	
8. Semester	Semester 2	
9. Objective of subject	To enable students to: Understand the basic concepts of Operating Systems, structure, memory organisation, components of OS and the basics of data communication.	
10. Synopsis of subject	Organisation of operational system; Memory organisation; Processing management; File management; I/O management; Basic concepts of data communication; Internet & applied networks; Basic network technology.	
11. Details of subject	<b>Contents</b>	<b>Hours</b>
Week 1	<b>Topic:</b> <b>Introduction To Operating System</b> <ul style="list-style-type: none"> <li>• A1: Operating System.</li> <li>• A2: Types of operating system.</li> <li>• A3: Development history of operating system.</li> </ul>	4

	<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 the various components of modern Operating Systems</li> <li>• Understand the history of Operating Systems development</li> <li>• Give some examples of common Operating Systems.</li> </ul> <p><b>Further reading for this lesson:</b> Flynn &amp; McHoes. (2001). Chapter 1.</p>	
<p><b>Week 2 and 3</b></p>	<p><b>Memory Management 1</b></p> <ul style="list-style-type: none"> <li>• B1: Fixed, Dynamic and Relocatable Dynamic partitions.</li> <li>• B2: Paged Memory Allocation.</li> <li>• B3: Paging requirements.</li> </ul> <p><b>Memory Management 2</b></p> <ul style="list-style-type: none"> <li>• C1: Page replacement concepts and policies.</li> <li>• C2: Segmented Memory Allocation.</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 how the various memory management schemes function</li> <li>• Describe and compare various memory management schemes</li> <li>• Solve numerical problems using specific memory management algorithms.</li> </ul> <p><b>Further reading for this lesson:</b> Flynn &amp; McHoes. (2001). Chapters 2 &amp; 3.</p>	<p>8</p>
<p><b>Week 4</b></p>	<p><b>Process Management</b></p> <ul style="list-style-type: none"> <li>• D1: Job Scheduling vs Process scheduling</li> <li>• D2: Process scheduling algorithms and policies.</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 how the various process management schemes function</li> <li>• Describe and compare various process management techniques</li> <li>• Solve numerical problems using specific process management algorithms.</li> </ul> <p><b>Further reading for this lesson:</b> Flynn &amp; McHoes. (2001). Chapter 4.</p>	<p>4</p>

<p><b>Week 5</b></p>	<p><b>4. Device Management</b></p> <ul style="list-style-type: none"> <li>• E1: System devices, sequential and Direct Access Storage.</li> <li>• E2: I/O subsystem components &amp; interdevice.</li> <li>• E3: Communications.</li> <li>• E4: I/O request management.</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 how the various device management schemes function</li> <li>• Describe and compare various device management techniques</li> <li>• Solve numerical problems using specific device management algorithms.</li> </ul> <p><b>Further reading for this lesson:</b> Flynn &amp; McHoes. (2001). Chapter 7.</p>	<p>4</p>
<p><b>Week 6 and 7</b></p>	<p><b>File Management</b></p> <ul style="list-style-type: none"> <li>• F1: File organisation &amp; interaction with file manager.</li> <li>• F2: Physical storage allocation and access methods.</li> <li>• F3: Levels in a file management system.</li> <li>• F3: Access control verification module.</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 how the various file management schemes function</li> <li>• Describe and compare various file management techniques</li> <li>• Solve numerical problems using specific file management algorithms.</li> </ul> <p><b>Further reading for this lesson:</b> Flynn &amp; McHoes. (2001). Chapter 8.</p>	<p>8</p>
<p><b>Week 8</b></p>	<p><b>Data Communications and Computer Networks.</b></p> <ul style="list-style-type: none"> <li>• G1: Introduction and features of computer networks.</li> <li>• G2: Network architecture model.</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 the role of computer networks</li> <li>• Define and differentiate the Network Architecture Models.</li> </ul> <p><b>Further reading for this lesson:</b> White. (2002). Chapter 1.</p>	<p>4</p>

<p><b>Week 9 and Week 10</b></p>	<p><b>Local Area Network (LAN)</b></p> <ul style="list-style-type: none"> <li>• H1: Function and Basic Topology of LAN</li> <li>• H2: Medium Access Control Protocol</li> <li>• H3: Examples of LANs and LAN Internetworking</li> </ul> <p><b>LAN Software</b></p> <ul style="list-style-type: none"> <li>• I1: Networking Operating Systems</li> <li>• I2: Networked Software</li> </ul> <hr/> <p><b>Learning Outcomes:</b> At the end of the lessons students will be able to:</p> <ul style="list-style-type: none"> <li>• Define and explain the different types of network topologies, MAC protocols and network equipments used for setting up LANs</li> <li>• Define and explain roles of hubs, MAUs, bridges and switches in Internetworking</li> <li>• Create network topology diagrams to address the requirements of a particular organisation or user</li> <li>• Understand the different Network Operating Systems</li> <li>• List the various software and applications used in a network.</li> </ul> <hr/> <p><b>Further reading for this lesson:</b> White. (2002). Chapters 7, 8 &amp; 9.</p>	<p>8</p>
<p><b>Week 11 and Week 12</b></p>	<p><b>Wide Area Network (WAN)</b></p> <ul style="list-style-type: none"> <li>• J1: WAN Basics, Routing and Network congestion</li> <li>• J2: PSTN, ISDN, Frame Relay, ATM, DSL</li> </ul> <p><b>Internet</b></p> <ul style="list-style-type: none"> <li>• K1: Internet Services and Protocols</li> <li>• K2: The Future of the Internet</li> </ul> <hr/> <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 the role of WANs</li> <li>• Differentiate between circuit switched and packet switched networks</li> <li>• Describe and differentiate the different telecommunications technologies</li> <li>• Name the TCP/IP standards and its influence on the Internet</li> <li>• Give examples of the various protocols used in each layer of the OSI Model.</li> </ul> <hr/> <p><b>Further reading for this lesson:</b> White. (2002). Chapters 10, 11 &amp; 12.</p>	<p>8</p>
<p><b>Week 13 and Week 14</b></p>	<p><b>Security and Network Management</b></p> <ul style="list-style-type: none"> <li>• L1: Security, Network Attacks and Firewalls</li> <li>• L2: Network Management and Monitoring</li> </ul>	<p>8</p>

		<p><b>Learning Outcomes:</b> At the end of the lessons students will be able to:</p> <ul style="list-style-type: none"> <li>• Explain the importance of network security and some basic means of protecting a network</li> <li>• Understand the methods and tools used for network management and monitoring.</li> </ul>	
		<p><b>Further reading for this lesson:</b> White. (2002). Chapters 13 &amp; 14.</p>	
		<b>Total</b>	56
<b>12. Text</b>	<b>Compulsory</b>	<ol style="list-style-type: none"> <li>1. I. Flynn, I. M., &amp; McHoes, A. (2001). <i>Understanding Operating Systems</i> (3<sup>rd</sup> ed.). PWS Publishing.</li> <li>2. White, C. (2002). <i>Data Communications and Computer Networks: A Business User's Approach</i> (2<sup>nd</sup> ed.). Course Technology, Thomson Learning.</li> </ol>	
	<b>Reference</b>	<ol style="list-style-type: none"> <li>1. Beyda, W. (2000). <i>Data Communications - From Basic to Broadband</i> (3<sup>rd</sup> ed.). Prentice-Hall.</li> <li>2. Gelber, S. (1997). <i>Data Communications Today: Networks, the Internet, and the Enterprise</i> (2<sup>nd</sup> ed.). Prentice Hall.</li> <li>3. Silberschatz, A., &amp; Galvin, P. (1998). <i>Operating System Concepts</i> (5<sup>th</sup> ed.). Addison Wesley.</li> <li>4. Nutt, J. (1997). <i>Operating Systems: A Modern Perspective</i>. Addison Wesley.</li> </ol>	