

## OUTCOMES BASED LEARNILNG MATRIX

**Course:** CTIM278 Data Communications **(3 credits, 45 hours)**  
**Department:** Computer Technology and Information Management

**Description:**

**This course provides an overview of the broad area of business data communications. The fundamental concepts of communications in the computer and telecommunications field are covered. Specific equipment and hardware, such as multiplexers, concentrators, and front-end processors are studied. Various types of transmission will be discussed such as modulation, duplex transmission, and errors. Basic network concepts like topologies, architecture, protocols, and media are discussed in detail.**

Prerequisite: None

While completing the table below, remember that the individual outcomes you list in the first column should answer this question: **What must the learner know and be able to do at the end of the course?** Items in the third column should answer the question: **How do we know?** The second column is where teachers can be most creative; it's for pedagogy. Each rectangle in column one should contain just one outcome; the corresponding rectangles in columns two and three, however, may contain more than one item. Using the code at the end of the matrix, indicate the core competencies being strengthened by the outcomes activities and the assessment tools.

*COURSE OUTCOMES	OUTCOMES ACTIVITIES	ASSESSMENT TOOLS
1. The student will be able to identify the various definitions for data communications and networking and how they are used in the communications industry.	1. Define data communications. (R) 2. Define telecommunications. ( R) 3. Define LAN, WAN, MAN, and wireless networking. (R) 4. Identify the components of a	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>• Chapter Review Quiz (ILW)</li> </ul>

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	<p>communication system. (R)</p> <p>5. Identify data communications effect on our daily lives. (R)</p>	
<p>2. The student will be able to identify the different types of signals and data codes and the structure of the telephone network.</p>	<p>1. Define bit and baud rate and frequency and bandwidth. (R)</p> <p>2. Define digital and analog signals. (R)</p> <p>3. Define a modem. (R)</p> <p>4. Define data codes. (R)</p>	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>• Chapter Review Quiz (ILW)</li> </ul>
<p>3. The student will be able to identify the different types of communications media and the advantages and disadvantages of each and explain the differences among servers and clients.</p>	<p>5. Define the difference between conducted and radiated media. (R)</p> <p>6. Define the different types of hardwire cabling; UTP, coax, and fiber. (R)</p> <p>7. Define the difference between softwire cabling; microwave and broadcast radio. (R)</p> <p>8. Identify servers and clients. (R)</p>	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>Research various hardwire cabling: Generate comparison spreadsheet. (ILW, IG)</li> <li>Scenarios: Select best cable choice. (IL WC, CCT IG)</li> <li>• Chapter Review Quiz (ILW)</li> </ul>
<p>3. The student will be able to identify the different types of communications media and the advantages and disadvantages of each and explain the differences among servers and clients.</p>	<p>9. Define the difference between conducted and radiated media. (R)</p> <p>10. Define the different types of hardwire cabling; UTP, coax, and fiber. (R)</p> <p>11. Define the difference between</p>	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>Research various hardwire cabling: Generate comparison spreadsheet. (ILW, IG)</li> <li>Scenarios: Select best cable choice. (IL WC, CCT IG)</li> </ul>

	<p>software cabling; microwave and broadcast radio. (R)</p> <p>12. Identify servers and clients. (R)</p>	<ul style="list-style-type: none"> <li>• Chapter Review Quiz (ILW)</li> </ul>
<p>5. The student will learn the development of network connections.</p>	<ol style="list-style-type: none"> <li>1. Identify the WAN and MAN topologies. (R)</li> <li>2. Identify IBM's System Network. (R)</li> <li>3. Identify System Application Architecture. (R)</li> <li>4. Identify the differences among layered architectures. (R)</li> </ol>	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>• Chapter Review Quiz (ILW)</li> </ul>
<p>6. The student will learn the components of a Local Area Network.</p>	<ol style="list-style-type: none"> <li>1. Identify the hardware/ in a LAN. (R)</li> <li>2. Identify the topology in a LAN. (R)</li> <li>3. Identify access methods in a LAN. (R)</li> <li>4. Identify the NOS used in a LAN. (R)</li> <li>5. Define gateway, bridge, and router in the context of a LAN. (R)</li> </ol>	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>• Design a LAN topology. (ILW,IG, QL)</li> <li>• Assignment of a TERM Paper: Design a LAN. (IL WC, IG, QL)</li> <li>• Chapter Review Quiz (ILW)</li> </ul>
<p>7. The student will learn what other hardware devices are used to combine data signals before they are transmitted, to direct and monitor network traffic, and to</p>	<ol style="list-style-type: none"> <li>1. Define the role of multiplexers. (R)</li> <li>2. Identify forms of multiplexing. (R)</li> <li>3. Define concentrators, front-end</li> </ol>	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>• Chapter Review Quiz (ILW)</li> </ul>

convert the data to an appropriate format for the receiving devices.	processors, and controllers. (R) 4. Identify the role of protocol conversion. (R) 5. Identify monitoring equipment and different ports. (R)	
8. The student will learn how today's networks connect different types of terminals, computers, and devices from many different manufacturers across different type of networks.	1. Define the role of software in a network. (R) 2. Define protocol and how it's used. (R) 3. Define the OSI model. (R) 4. Identify the different types of protocols. (R)	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>• Chapter Review Quiz (ILW)</li> </ul>
9. The student will learn the communication services categorized by bandwidth and circuit switching.	1. Define the difference between narrowband and wideband. (R) 2. Identify switching offices. (R) 3. Identify the type of exchange carriers. (R)	<ul style="list-style-type: none"> <li>• Review Questions. (ILW)</li> <li>• Term Paper Due</li> <li>• Labs (CCT IG, OC, QL, IL WC)</li> <li>• Chapter Review Quiz (ILW)</li> </ul>
To strengthen Core Competencies** in order to increase success in this and other courses and in the workplace.	Referenced above	Referenced above.

\*Try to express an outcome as an infinitive phrase that concludes this sentence: **At the end of the course, the students should be able to . . .** Finding the line between too general and too specific can be difficult. In an English Composition course, for instance, it is probably too general to say, "The student should be able to write effective essays." It is probably too specific to say, "The student should be able to write an introductory paragraph of at least 50 words, containing an attention-getting device, an announcement of the narrowed topic, and an explicit thesis sentence." Just right might read, "The student will write introductions that gather attention and focus the essay."

\*\*Indicate the Core Competencies that apply to the outcomes activities and assessment tools: critical and creative thinking (CCT); oral communications (OC); quantitative literacy (QL); information literacy (IL); written communication (WC); civic engagement (CE); integrative learning (IG); global learning (GL).