



**Flow up of  
implementation  
syllabus**

<b>Course Instructor</b>	Dr. Ali Basim Yousif
<b>E_mail</b>	ali.alkhafaji.eps@utq.edu.iq
<b>Title</b>	Communications and Computer Networks
<b>Course Coordinator</b>	
<b>Course Objective</b>	<ol style="list-style-type: none"> <li>1. Build an understanding of the fundamental concepts of computer networking.</li> <li>2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.</li> <li>3. Introduce the student to advanced networking concepts, preparing the student for entry advanced courses in computer network technology.</li> <li>4. Independently understand basic computer network technology.</li> <li>5. Identify the different types of network topologies and protocols.</li> <li>6. Enumerate the layers of the OSI model and TCP/IP.</li> <li>7. Explain the different protocols.</li> <li>8. Describe the functions of Network Layer i.e. Logical addressing, subnetting &amp; Routing.</li> <li>9. Explain types of errors, error detection and correction, and error correction methods.</li> <li>10. Explain analog and digital signals, digital transmission, and digital-to-digital encoding.</li> <li>11. Explain analog transmission, digital-to-analog conversion, and multiplexing.</li> </ol>
<b>Course Description</b>	<p>Syllabus:</p> <p><b>Part 1</b></p> <ul style="list-style-type: none"> <li>• Introduction to Data Communication</li> <li>• Network Benefits and Criteria</li> <li>• Network Topology</li> <li>• Categories of Networks</li> <li>• Protocols and Standards</li> </ul> <p><b>Part 2</b></p> <ul style="list-style-type: none"> <li>• Layered Architecture, The OSI Model (7 Layers)</li> <li>• TCP/IP Model</li> </ul>

- The TCP/IP Protocol Suite, SMTP, HTTP, FTP, NFS, SNMP, DNS, DHCP, MIME, Telnet, RPC, iSCSI
- TCP, UDP, IP, ICMP, ARP, RARP, CSMA/CD

### **Part 3**

- Network Layer
- Addressing, Internet Address and Classful Addressing
- Subnetting
- Routing
- Routing Table

### **Part 4**

- Data link layer
- Error detection and correction, Types of Errors
- Error correction methods (Parity Check, Two-Dimensional Parity, Cyclic Redundancy Check-CRC, Checksum, Hamming Code)

### **Part 5**

- Physical Layer
- Analog and Digital Signals and Data
- Digital Transmission
- Digital-to-Digital Encoding
  - Unipolar encoding
  - Polar encoding (NRZ-L, NRZ\_1, RZ, Manchester, Differential Manchester)
  - Bipolar encoding (AM1, BnZS, HDB3)
- Analog-to-Digital Encoding
  - Pulse Code Modulation (PCM)
- Digital Data Transmission Mode (Parallel mode, Serial mode)

### **Part 6**

- Analog Transmission
- Digital-to-Analog Conversion (Modulation)
  - ASK
  - FSK
  - PSK
  - QAM
- Analog-to-Analog Conversion
  - AM
  - FM
  - PM
- Multiplexing
  - Frequency-division Multiplexing (FDM)
  - Time-division Multiplexing (TDM)

<b>Textbook</b>					
<b>References</b>	Data Communications and Networking By Behrouz A. Forouzan (Fourth Edition).				
<b>Course Assessment</b>	Term Tests	Laboratory	Quizzes	Project	Final Exam
	First Semester (30) Second Semester (30)	First Semester (15) Second Semester (15)	First Semester (5)	Second Semester (5)	(50)
<b>General Notes</b>					



**Flow up of  
implementation  
syllabus**

## Course weekly Outline

week	Date	Topics Covered	Lab. Experiment Assignments	Notes
1	17/9/2023	Introduction to Data Communication	Introduction to Computer Networks	
2	24/9/2023	Networks Benefits and Criteria	Definition of Cisco Packet Tracer Program	
3	01/10/2023	Network Topology	Internet Protocol (IP)	
4	08/10/2023	Categories of Networks	Address Classes in Networking	
5	15/10/2023	Protocols and Standards	Design and Implementation of a virtual computer network	
6	22/10/2023	Layered Architecture, The OSI Model (7 layers)	Hub Device	
7	29/10/2023		Design and Implementation of network consist of computers and switches devices	
8	05/11/2023		Client and Server	
9	12/11/2023	TCP/IP Protocol Suite	Design and Implementation of network consist of computers and server	
10	19/11/2023		Domain Name System (DNS) and HTTP (Hyper Text Transfer Protocol)	
11	26/11/2023	Network Layer	Design and Implementation of network consist of computer and server using DNS and HTTP	
12	03/12/2023		Router and Modem	

<b>13</b>	10/12/2023	IPv4 Address	Design and Implementation of computer network using router device	
<b>14</b>	17/12/2023		Design and Implementation of computer network using wireless router device	
<b>15</b>	24/12/2023	<b>Exams</b>		
<b>16</b>	11/1/2024	<b>Exams</b>		

## Half-year Break

<b>17</b>	28/1/2024	Classful Addressing	Design and Implementation of network consist of two routers	
<b>18</b>	04/2/2024			
<b>19</b>	11/2/2024	Subnetting	Design and Implementation of network consist of three routers	
<b>20</b>	18/2/2024	Routing and Routing Table		
<b>21</b>	25/2/2024	Data Link layer Error Detection and Correction Error Correction Methods	Routing Table of router device	
<b>22</b>	03/3/2024			
<b>23</b>	10/3/2024			
<b>24</b>	17/3/2024	Physical Layer Analog and Digital Signals		
<b>25</b>	24/3/2024			
<b>26</b>	31/3/2024	Digital Transmission		
<b>27</b>	07/4/2024	Digital-to-Digital Encoding		
<b>28</b>	14/4/2024	Analog-to-Digital Encoding		
<b>29</b>	21/4/2024	Analog Transmission		
<b>30</b>	28/4/2024	Digital-to-Analog Conversion (Modulation)		
<b>31</b>	05/5/2024	Multiplexing		
<b>32</b>	12/5/2024	<b>Exams</b>		

The Ministry of Higher Education  
& Scientific Research  
**2024-2023**



**Flow up of  
implementation  
syllabus**

**University: Thi-Qar  
College: Education for Pure Science  
Department: Computer Science  
Stage: Fourth  
Lecturer name: Dr. Ali Basim Yousif  
Academic Status: Lecturer  
Qualification: Ph.D.  
Place of work: University of Thi-Qar**

تؤيد اللجنة العلمية مطابقة الخطة التدريسية لمفردات منهج المادة الدراسية

.....  
**Instructor Signature(Lab.)**

.....  
**Instructor Signature(Theoretical)**

.....  
**1<sup>st</sup> Scientific committee member**

.....  
**2<sup>nd</sup> Scientific committee member**

.....  
**3<sup>rd</sup> Scientific committee member**

.....  
**Head of Scientific committee**

.....  
**Dean**