هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

# Course Specification

| | |
|---|---|
| Course Title: | **Computer Networks** |
| Course Code: | **165 CIS-3** |
| Program: | **Programming and Database** |
| Department: | **Computer** |
| College: | **Applied College** |
| Institution: | **Najran University** |
| Version: | **version 4** |
| Last Revision Date: | 7 Aug 2023 |

# Table of Contents:

# A. General information about the course:

| Course Identification | | | | | |
|---|---|---|---|---|---|
| **1. Credit hours:** | 3 (2+1) | | | | |
| **2. Course type** | | | | | |
| a. | University ☐ | College ☐ | Department☒ | Track☐ | Others☐ |
| b. | Required ☒ | Elective☐ | | | |
| **3. Level/year at which this course is offered:** | **Level: 3rd** | | | | |
| **4. Course general Description** | | | | | |
| This course introduces the principles, design, and implementation of computer networks. This course is based on layering architecture. Topics include: Overview of Computer Networks, communication models, TCP/IP Protocol suit, Network Performance Management, Transmission Media, Network Devices, Network Addressing, Network Protocols. | | | | | |
| **5. Pre-requirements for this course (if any):** | | | | | |
| None | | | | | |
| **6. Co- requirements for this course (if any):** | | | | | |
| None | | | | | |
| **7. Course Main Objective(s)** | | | | | |
| • Introduce the main concepts of Data communications and computer networks.<br>• Introduce the network layers' services and protocols, devices, and Mediums.<br>• Design and implement LAN and WAN network and appropriate IPv4 addressing schemes.<br>• Use the appropriate network hardware and software to construct various networks | | | | | |

## 1. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1. | Traditional classroom | 4 hours per week | 95% |
| 2. | E-learning | | 5% |
| 3. | Hybrid<br>• Traditional classroom<br>• E-learning | | |
| 4. | Distance learning | | 100% |

## 2. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|---|---|---|
| **1.** | **Lectures** | **30** |
| **2.** | **Laboratory/Studio** | **30** |
| **3.** | **Field** | |
| **4.** | **Tutorial** | |
| **5.** | **Others (specify)** | |
| | Total | 60 |

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| 1.0 | Knowledge and understanding | | | |
| 1.1 | Explain the key terminologies and concepts of data-communications and networking | K1 | • Lecture<br>• Discussion | •Exam<br>•Assignments<br>•Quizzes |
| 1.2 | Classify the various network layers services and protocols, devices, Mediums and types that can be used in a real-world network | K2 | | |
| … | | | | |
| 2.0 | Skills | | | |
| 2.1 | Design different types of networks based on IP classes and network topologies | S2 | •Lecture<br>•Discussion<br>•Lab work<br>•Brainstorming | •Exam<br>•Assignments<br>•Quizzes |
| 2.2 | Setup different types of network and manage them using proper network simulator and software | S1 | | |
| 2.3 | Analyze and Implement different network protocols in TCP/IP | S1 | | |
| 3.0 | Values, autonomy, and responsibility | | | |
| 3.1 | Demonstrate the ability to work in group laboratory activities, delivers presentations. | C1 | • Discussion<br>• Project | •Assignments<br>•Report |
| 3.2 | | | | |
| ... | | | | |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|
| 1. | • Background and overview of the course<br>• Overview of Data communications<br>• Lab: Introduction to Cisco Packet Tracer and create simple topology | 4 |
| 2. | • Networks<br>• Type of Connection<br>• Physical Topology<br>• Lab: Ethernet cable types and connecting Network devices | 4 |
| 3. | • NETWORK TYPES<br>• Protocols and standards<br>• Lab: Connecting Networks with different IP<br>• Lab: Design network topologies | 4 |
| 4. | • Network models<br>• Layered tasks<br>• TCP/IP protocol suite<br>• Addressing<br>• Lab: Network Devices | 6 |
| 5. | • Physical layer concepts.<br>• Digital Signals and its representation blocks. Using Switch | 3 |
| 6. | • Transmission media<br>• Wired and wireless<br>• Lab: Connecting Networks with different IP blocks. Using Router | 4 |
| | • Data link layer Concepts | 4 |
| 7. | • Network layer concepts<br>• Network layer services<br>• Lab: Prepare DHCP-server at a server | 6 |
| 8. | • Ipv4 Addresses<br>• DHCP and NAT<br>• Lab: Prepare DHCP-server at a server to support many networks over router | 6 |
| 9. | • IP Protocol | 4 |
| 10. | • ICMP Protocol | 3 |
| | • Unicast Routing Protocols | 4 |
| | • Transport layer Concepts | 4 |
| | • Application Layer Concepts | 4 |
| Total | | 60 |

## D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|
| 1. | Assignment | 4, 7, 11 | 10% |
| 2. | Mid Monthly Exam | 8 | 20% |
| 3. | Practical exam | 15 | 20% |
| 4. | Final exam | 17 | 50% |
| 5. | Total | | 100% |

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

## E. Learning Resources and Facilities

### 1. References and Learning Resources

| | |
|---|---|
| Essential References | Behrouz A. Forouzan, Data communications and networking, 5th Edition, McGraw-Hill, 2013, ISBN:9780-07-337622-6 |
| Supportive References | William Stallings Data and Computer Communications, 10th Edition, Pearson, 2014, ISBN-10: 0-13-350648-7 |
| Electronic Materials | http://www.nu.edu.sa/web/guest/979<br>• Najran University E.Library<br>• Saudi Digital Library |
| Other Learning Materials | Manuals of Network simulators and network managements software |

### 2. Required Facilities and equipment

| Items | Resources |
|---|---|
| facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Computer Lab with 25 seats + A Lecture room with 30 seats per section |
| Technology equipment (projector, smart board, software) | 25 PCs, Data show, Cisco Packet Tracer Software, Network Simulators, Software to manage networks. |
| Other equipment (depending on the nature of the specialty) | Networks cabling tools, Switches and routers |

## F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| Effectiveness of teaching | Head of the department and Departmental Council discussions | Directly |
| Effectiveness of students Assessment | Students | End term Questionnaire |
| Quality of learning resources | instructor | Direct (software) CLO assessment |
| The extent to which CLOs have been achieved | | |
| Other | | |

**Assessor** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval Data

| | | |
|---|---|---|
| COUNCIL /COMMITTEE | | |
| REFERENCE NO. | | |
| DATE | | |