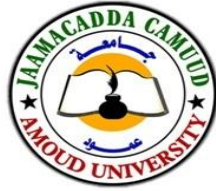

AMOU UNIVERSITY
“A Vehicle for Peace and Development”
AMOU UNIVERSITY



FACULTY OF COMPUTING AND ICT

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY PROGRAMME

ACADEMIC YEAR 2015/ 2016

COURSE DESCRIPTION

BIT 223	Data Communications
Contact Hours	52
Prerequisite	BIT 215 Network Essentials
Purpose/Aim	This course will discuss basic principles of data communication and computer networks.
Course Objective (Indicative Learning Outcomes)	Students should appreciate media types and standards, and how data is encoded and transmitted. Students are also introduced to the terminology and basic concepts of each network operating system. The Open Systems Interconnection (OSI) model is introduced and revisited throughout the course, and then examined in detail at the end of the course. TCP/IP and another to subnetting are two other focal points of importance in this course.
	<ul style="list-style-type: none"> • Network Media – Copper Core Cable Network Media; Analog and Digital Signals – Frequency, Attenuation, Interference, Latency Data Transmission - Bandwidth, Baseband, Broadband Simplex, Full-Duplex, and Half-Duplex Communication; Electronic Terms - Direct Current and Alternating Current, Resistance and Impedance, Reflected Loss, Crosstalk Copper Core Cables - Coaxial Cable, Twisted Pair IEEE 802.3 and 802.5 Standards - IEEE 802.3, IEEE 802.5 ARCnet Standard; Wiring Faults – Short, Open, Ground, Reversed, Crossed and Split Pairs • Fiber-Optic Cable Characteristics of Fiber-Optic Cable; Security, Immunity to Electromagnetic Interference, Weight and Size, Safety, Bandwidth, Corrosion and Water Resistance, Greater Distances The Nature of Light; Fiber-Optic Cable Construction; Fiber-Optic Cable Transmission Characteristics – Attenuation; IEEE 802.3 Standards Fiber Distributed Data Interface (FDDI); Fiber-Optic Cable Connectors • Wireless Technology Electromagnetic Waves - Radio and Microwave Transmission, Infrared Transmission, Radio Interference Antenna Styles – Omni, Dipol, Yagi, Flat Panel, Parabolic Radio Wave Transmission Techniques and Networking - Radio Wave-Based Transmission Techniques Radio Wave-Based Networking - The IEEE 802.11 Standard, IEEE 802.11 Access Method, New IEEE Wireless Standards, Bluetooth, Cellular Technology;



AMOU UNIVERSITY
“A Vehicle for Peace and Development”

	<p>Microwave Transmission and Networking; Infrared Transmission and Networking; Advantages and Disadvantages of Wireless Technology Wireless Security - 802.1X Authentication, 802.1X Encryption, Wi-Fi Protected Access</p> <ul style="list-style-type: none"> • Digital encoding and Data Transmission <p>Digital Encoding and Transmission; Data Packaging and Transmission Parity Checks; Cyclic Redundancy Check (CRC); Segmentation and encapsulation; Connection-Oriented and Connectionless Communication Circuit Switching/ Packet Switching; Data Codes – ASCII, BCD, EBCDIC, Unicode; HTML; Protocol Frame Structures; UDP Frame Structure Ethernet Frame Structure; Data Encoding, Transmission, and the OSI Model - Application Layer, Presentation Layer, Session Layer, Transport Layer, Data Link Layer, Physical Layer</p> <ul style="list-style-type: none"> • Wireless Technology <p>Electromagnetic Waves; Radio and Microwave Transmission; Infrared Transmission; Radio Interference; Antenna Styles – Omni, Dipol, Yagi, Flat Panel, Parabolic; Radio Wave Transmission Techniques and Networking Radio Waved-Based Transmission Techniques; Radio Wave-Based Networking; The IEEE 802.11 Standard; IEEE 802.11 Access Method New IEEE Wireless Standards; Bluetooth; Cellular Technology; Microwave Transmission and Networking; Infrared Transmission and Networking Advantages and Disadvantages of Wireless Technology; Wireless Security, 802.1X Authentication, 802.1X Encryption, Wi-Fi Protected Access</p> <ul style="list-style-type: none"> • Digital encoding and Data Transmission <p>Digital Encoding and Transmission; Data Packaging and Transmission Parity Checks; Cyclic Redundancy Check (CRC); Segmentation and encapsulation; Connection-Oriented and Connectionless Communication Circuit Switching/ Packet Switching; Data Codes – ASCII, BCD, EBCDIC, Unicode; HTML; Protocol Frame Structures; UDP Frame Structure; Ethernet Frame Structure; Data Encoding, Transmission, and the OSI Model - Application Layer, Presentation Layer, Session Layer, Transport Layer, Data Link Layer Physical Layer</p> <ul style="list-style-type: none"> • Network Operating Systems and Network Communications <p>Common Network Operating System Traits; Network Operating Systems and Hardware Protocols; Ethernet, AppleTalk, Token Ring, Token Bus, ARCnet Network Operating Systems and Networking Protocols; NetBIOS, NetBEUI, IPX/SPX, TCP/IP</p> <ul style="list-style-type: none"> • Microsoft Network Operating Systems <p>A Brief History of Microsoft Network Operating Systems; Common Window Server Administrative Components; User Account, Group Account, Security Policy, Network Share, Disk Management; Administrative Tools ; Window NT Windows NT Network Administrative Models; The Domain Model Windows NT Administration; Windows 2000 Server and Windows Server 2003; Active Directory; Windows 2000/2003 Administration; Major Differences in Windows Server 2003; POSIX; Interoperability Gateways and Services; Microsoft Operating System Client Configuration</p> <ul style="list-style-type: none"> • Novell Network Operating Systems <p>A Brief History of NetWare, Novel Kernel and NetWare Loadable Modules</p>
--	--



AMOU UNIVERSITY
“A Vehicle for Peace and Development”

	<p>(NLM), NetWare Process; NetWare Console; Console Commands; Servetop ConsoleOne; Monitor; NetWare File Systems; eDirectory; eDirectory; Organization; eDirectory Tree Structure; NetWare Security; NetWare 6 Administration; NetWare Connectivity and Interoperability, Novel Client; Native File Access Pack (NFAP); Web-Based Access,</p> <ul style="list-style-type: none"> • UNIX/Linux Operating Systems <p>UNIX; Linux; Linux Advantages; Linux Disadvantages; Copyright and Copyleft; UNIX/Linux Basics; LILO and GRUB; Shells; Commands File Systems; File Structure; Common Files and Directories File and Directory Security; Network Authentication; File and Print Sharing; Remote Access Features; X Window System; Interoperability; Samba; Windows and NFS; MAX OS X Server</p> <ul style="list-style-type: none"> • TCP/IP Fundamentals <p>IP Addressing ; Network Class ; Subnet Mask ; Reserved IP Addresses Viewing IP Configuration Settings ; Domain Name System (DNS) Internet Corporation for Assigned Names and Numbers (ICANN) Fully Qualified Domain Name (FQDN); DNS Structure and Operation Hosts and Lmhosts Text Files ; The IP, TCP, and UDP Protocols Relationship to the OSI Model ; Frame Formats ; Assigning IP Addresses Windows Internet Naming Service (WINS); Dynamic Host Configuration Protocol (DHCP) ; DHCP Lease ; Automatic Private IP Addressing (APIPA) Bootstrap Protocol (BOOTP) ; TCP/IP Ports and Sockets TCP/IP Troubleshooting Utilities; Netstat; Ntstat ; Ping; Tracert or Traceroute; ARP ; Nslookup; The IPv6 Standard ; Loopback Address ;IPv6 MAC Address</p> <ul style="list-style-type: none"> • Remote Access and Long Distance Communications <p>Introduction to Telecommunications Systems; Remote Connection Technologies and Media; Public Switched Telephone Network (PSTN); ISDN; Cable Internet Service; Satellite; T-Carrier; FDDI; SONET; X.25; Frame Relay; Dial-Up Networking; Dial-In Only; Dial-Out Only; Full-Service Remote Desktop Protocol; Remote Access Protocols; Virtual Private Networks (VPN) ; Designing a Small Network.</p>														
Learning & Teaching Methodologies	Lectures, tutorials and computer laboratory exercises														
Instructional Materials/Equipment	Classroom with audio visual aids Computer laboratory														
Course Assessment	<table border="1"> <thead> <tr> <th>Type</th> <th>Weighting (%)</th> </tr> </thead> <tbody> <tr> <td>Final Examination</td> <td>60</td> </tr> <tr> <td>Mid Term Examinations</td> <td>20</td> </tr> <tr> <td>Continuous Assessment(Assignments)</td> <td>10</td> </tr> <tr> <td>Attendance</td> <td>10</td> </tr> <tr> <td>Total</td> <td>100</td> </tr> </tbody> </table>		Type	Weighting (%)	Final Examination	60	Mid Term Examinations	20	Continuous Assessment(Assignments)	10	Attendance	10	Total	100	
Type	Weighting (%)														
Final Examination	60														
Mid Term Examinations	20														
Continuous Assessment(Assignments)	10														
Attendance	10														
Total	100														
Recommended Reading	<table border="1"> <thead> <tr> <th>Title</th> <th>Author</th> <th>Publisher</th> </tr> </thead> <tbody> <tr> <td>Networking Fundamentals</td> <td>Richard M. Roberts</td> <td>Goodheart-Willcox Publisher, Inc., Tinley Park, IL.</td> </tr> </tbody> </table>	Title	Author	Publisher	Networking Fundamentals	Richard M. Roberts	Goodheart-Willcox Publisher, Inc., Tinley Park, IL.								
Title	Author	Publisher													
Networking Fundamentals	Richard M. Roberts	Goodheart-Willcox Publisher, Inc., Tinley Park, IL.													
Additional Reading															
Other Support Material	A variety of multimedia systems and electronic information resources as prescribed by the lecturer. Various application manuals, URL search and journals.														