

30.1.4

**UNIVERSITY SCHOOL
OF
INFORMATION AND COMMUNICATION TECHNOLOGY**
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROGRAMME STRUCTURE

B.TECH. COMPUTER SCIENCE AND ENGINEERING
SPECIALIZATION : CYBER SECURITY

2023-2027

30.1.4

08.09.23



GAUTAM BUDDHA UNIVERSITY
GAUTAM BUDH NAGAR, GREATER NOIDA, UP, INDIA

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Greater Noida, (U.P.)

SEMESTER I

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	MA101	Engineering Mathematics-I	3	1	0	4	GE1
2	PH102	Engineering Physics	3	1	0	4	GE2
3	EE102	Basic Electrical Engineering	3	1	0	4	GE3
4	ME101	Engineering Mechanics	3	1	0	4	GE4
5	ES101	Environmental Studies	3	1	0	4	OE1 / AECC
6	PH104	Engineering Physics Lab	0	0	2	1	GE-L1
7	EE104	Basic Electrical Engineering Lab	0	0	2	1	GE-L2
8	EN151	Language Lab	0	0	2	1	OE-L1 / SEC
9	ME102	Workshop Practice	1	0	2	2	GE-L3 / SEC
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			16	5	8	25	

SEMESTER II

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CS101	Fundamentals of Computer Programming	3	1	0	4	CC1 / FC
2	CCC02	Introduction to Cyber Security	2	0	0	2	CC2 / FC
3	MA102	Engineering Mathematics-II	3	1	0	4	GE5
4	EC101	Basic Electronics Engineering	3	1	0	4	GE6
5	CS102	Computer Organistaion and Architecure	3	1	0	4	CC3
6	EN101	English Proficiency	2	0	0	2	OE2 / AECC
7	CE103	Engineering Graphics Lab	1	0	2	2	GE-L4
8	CS181	Computer Programming Lab	0	0	2	1	CC-L1 / SEC
9	CC182	Cyber Security Lab	0	0	2	1	CC-L2 / SEC
10	EC181	Basic Electronics Engineering Lab	0	0	2	1	GE-L5
11	GP	General Proficiency	Non Credit				
Total Hours and Credits			14	3	8	25	

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SEMESTER III

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CC201	Internet Technology	3	0	0	3	CC4 / SEC
2	CC203	Operating Systems	3	0	0	3	CC5
3	CC205	Data Structure & Algorithms	3	0	0	3	CC6 / SEC
4	CC207	Introduction to Python	3	0	0	3	CC7
5	CC209	Cyber Security Law and Standards	3	0	0	3	CC8
6	MA201	Engineering Mathematics-III	3	1	0	4	GE7
7	CC281	Internet Technology Lab	0	0	3	2	CC-L3
8	CC283	Data Structure & Algorithms Lab	0	0	3	2	CC-L4 / SEC
9	CC285	Python Programming Lab	0	0	3	2	CC-L5 / SEC
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			18	1	9	25	

SEMESTER IV

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CC202	Software Engineering	3	0	0	3	CC9
2	CC204	Database Management System	3	0	0	3	CC10 / SEC
3	CC206	Java Programming	3	0	0	3	CC11
4	CC208	Artificial Intelligence	3	0	0	3	CC12
5	CC210	Theory of Automata	3	0	0	3	CC13
6	CC212	Biometric Security	3	1	0	4	CC14 / SEC
7	CC282	Database Management System Lab	0	0	3	2	CC-L6 / SEC
8	CC284	Java Programming Lab	0	0	3	2	CC-L7 / SEC
9	CC286	Biometric Security Lab	0	0	3	2	CC-L8 / SEC
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			18	1	9	25	

SEMESTER V

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CC301	Compiler Design	3	0	0	3	CC15 / AECC
2	CC303	Soft Computing Techniques	3	0	0	3	CC16
3	CC305	Analysis and Design of Algorithms	3	0	0	3	CC17 / SEC
4	CC307	Cryptography and Data Privacy	3	0	0	3	CC18
5	CC309	Machine Learning Computer Networks	3	1	0	4	CC19 / SEC
6		Elective 1	3	0	0	3	E1 / DSE
7	CC381	Analysis and Design of Algorithms Lab	0	0	3	2	CC-L9 / SEC
8	CC383	Cryptography and Data Privacy Lab	0	0	3	2	CC-L10 / SEC
9	CC385	Machine Learning Lab	0	0	3	2	CC-L11 / SEC
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			18	2	9	26	

SEMESTER VI

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CC302	Web Development using PHP	3	0	0	3	CC20
2	CC304	Network Defense for Cyber Security - Risk Management and Audit	3	0	0	3	CC21
3	CC306	Cloud Computing	3	1	0	4	CC22
4	CC308	Digital Forensic, Audit and Investigations	3	0	0	3	CC23
5	CC310	Data Privacy and Database Security	3	0	0	3	CC24 / SEC
6		Elective 2	3	0	0	3	E2 / DSE
7	CC382	Web Development using PHP Lab	0	0	3	2	CC-L12 / SEC
8	CC384	Network Defense for Cyber Security Lab	0	0	3	2	CC-L13
9	CC386	Data Privacy and Database Security Lab	0	0	3	2	CC-L14
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			18	1	9	25	

Industrial Training will be done by candidate individually after third year during the summer break and it will be of minimum 4 weeks. It will be evaluated as per University Examination in VII semester.

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SEMESTER VII

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CC401	Parallel Processing and CUDA Programming	3	1	0	4	CC25
2	CC403	Blockchain Technology	3	0	0	3	CC26
3	CC405	AI Enabled Cyber Security	2	0	0	2	CC27 / SEC
4		Elective 3	3	0	0	3	E3 / DSE
5		Elective 4	3	0	0	3	E4 / DSE
6	CC481	AI Enabled Cyber Security Lab	0	0	3	2	CC-L15
7	CC491	Minor Project	0	0	10	5	MP1 / E
8	CC493	Industrial Training	0	0	6	3	IT1 / E
9	GP	General Proficiency	Non Credit				
Total Hours and Credits			14	1	19	25	

SEMESTER VIII

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CC490	Seminar	0	0	3	2	S / E
2	CC492	Major Project	0	0	16	8	MP2 / E
3	CC494	Internship	0	0	30	15	I / E
4	GP	General Proficiency	Non Credit				
Total Hours and Credits			0	0	49	25	

GRAND TOTAL OF CREDITS = 201

In the Seminar, student need to study and present individually, on latest research paper of their specialized area and It will be evaluated as per University Examination Rules.

The Internship in Industry will be done by candidate individually during the 8th semester and it will be for a minimum of 4 (-6) months. It will be evaluated as per University Examination Rules.

Minor and Major Project will be in a group and It will be evaluated as per University Examination Rules.

USICT will provide a mentor/supervisor for industrial training, seminar, internship, minor and major projects.

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ELECTIVES FROM DCSE

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CC311	Security Information & Event Management	3	0	0	3	E1
2	CC313	Intrusion Detection and Prevention System	3	0	0	3	E1
3	CC315	Cryptography	3	0	0	3	E1
4	CC317	Biometric System and Security	3	0	0	3	E1
5	CC319	Ethical Hacking	3	0	0	3	E1
6	CC312	Mobile Security	3	0	0	3	E2
7	CC314	Cloud Architecture and Security	3	0	0	3	E2
8	CC316	Principle of Secure Coding	3	0	0	3	E2
9	CC318	Information Warfare	3	0	0	3	E2
10	CC320	Social Network Security	3	0	0	3	E2
11	CC407	Physical Security of IT Infrastructure	3	0	0	3	E3
12	CC409	NISTA 800-53 (Security Control)	3	0	0	3	E3
13	CC411	Operating Systems Security	3	0	0	3	E3
14	CC413	Mobile and Wireless Network Security	3	0	0	3	E3
15	CC415	Enterprise Security and Management	3	0	0	3	E3
16	CC417	Malware Analysis	3	0	0	3	E4
17	CC419	Android Security Design and Internals	3	0	0	3	E4
18	CC421	Data and Database Management Security	3	0	0	3	E4
19	CC423	Web Application and Penetration Testing	3	0	0	3	E4
20	CC425	Access Control and Identity Management Systems	3	0	0	3	E4

CC Computer Science & Engineering / Cyber Security for Course Code

CC Core Course from USICT for Type of Course

GE General Elective from related discipline of other Deptt./School

GE L General Elective Lab from related discipline of other Deptt./School

OE Open Elective from other discipline of other Deptt./School

AECC Ability Enhancement Compulsary Course

DSE Discipline Specific Course

SEC Skill Enhancement Course

E Elective from USICT

CC-L Core Course Lab from USICT

IT1 Industrial Training

MP Minor / Major Project

S Seminar

I Internship

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COMPUTER NETWORKS			
Course Code:	CC309	Course Credits:	3
Course Category:	CC	Course (U / P)	U
Course Year (U / P):	3U	Course Semester (U / P):	5U
No. of Lectures + Tutorials (Hrs/Week):	03 + 00	Mid Sem. Exam Hours:	1
Total No. of Lectures (L + T):	45 + 00	End Sem. Exam Hours:	3
COURSE OBJECTIVES			
1. Describe how computer networks are organized with the concept of layered approach.			
2. Implement a simple LAN with hubs, bridges and switches.			
3. Analyze the contents in a given Data Link layer packet, based on the layer concept.			
4. Describe what classless addressing scheme is.			
5. Describe how routing protocols work.			
COURSE OUTCOMES			
At the end of the course the students should be able to:			
1. Analyse the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.			
2. Have a basic knowledge of the use of cryptography and network security.			
3. Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols.			
4. Analyse, specify and design the topological and routing strategies for an IP based networking infrastructure			
5. Have a working knowledge of datagram and internet socket programming			

UNIT I INTRODUCTION AND PHYSICAL LAYER

Key concepts of computer network, transmission media, network devices, network topology, topology design issues, types of network: LAN, MAN, WAN, PAN, ISDN systems and ATM network, OSI-reference model, open system standards, characteristics of network, TCP/IP model, protocols and standards, encoding technique.

UNIT II SWITCHING AND DATA LINK LAYER

Circuit switching, packet switching, message switching, hybrid switching, and ATM switching, multiplexing techniques: TDMA, FDMA, WDMA, CDMA, data link layer: LLC & MAC level protocols and design issues, issues IEEE 802 LAN Standards, framing, CRC, error control, flow control, HDLC, ALOHA and performance issues. Frames relay networks and performance parameters.

UNIT III NETWORK LAYER

Network layer design issues, overview of IPv4 and IPv6, addressing: class full and classless, static and dynamic, subnet and super net, auto configuration through DHCP, routing protocols:

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RIP, DVR, LSR, OSPF, BGP, congestion control algorithm, subnet concept, virtual LAN, ICMP, multicasting, mobile IP.

UNIT IV TRANSPORT LAYER

Port addressing schemes, connectionless and connection oriented services: TCP and UDP, wireless TCP, Congestion control, queue management, NAT, PAT, socket format at transport level, socket interface and programming.

UNIT V APPLICATION LAYER

Client server architecture, domain name services, application services: HTTP, TELNET, RLOGIN, FTP, CBR, NFS, SMTP, POP, IMAP, MIME, voice and video over IP, social issues- privacy, freedom of speech, copy right.

Text Books:

1. S. Tanenbaum, Computer Networks, 4th edition, Prentice Hall, 2008
2. Forouzan, B.A., Data Communication and Networking, Tata McGraw-Hill.
3. W. Stallings, Data and Computer Communications, 8th edition, Prentice Hall, 2007
4. Douglas E. Comer TCP/IP Principles, Protocols and Architecture, Pearson Education

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COMPUTER NETWORKS LAB			
Course Code:	CC385	Course Credits:	2
Course Category:	CC-P	Course (U / P)	U
Course Year (U / P):	3U	Course Semester (U / P):	5U
No. of Labs (Hrs/Week):	2(3 hrs)	Mid Sem. Exam Hours:	
Total No. of Labs:	10	End Sem. Exam Hours:	3
COURSE OBJECTIVES			
1. Practical knowledge of working principles of various communication protocols.			
2. Analyze structure and formats of TCP/IP layer protocols.			
3. Understanding of networking fundamentals.			
4. Understanding of learning the process of Internet of Things applications planning.			
5. Understanding of configuration of various end devices, server, routers and switches.			
COURSE OUTCOMES			
At the end of the course the students should be able to:			
1. Understand the practical approach to network communication protocols.			
2. Understand network layers, structure/format and role of each network layer.			
3. Able to design and implement various network application such as data transmission between client and server, file transfer, real-time multimedia transmission.			
4. Understand the various Routing Protocols/Algorithms and Internetworking.			
5. Learn to configure server.			

List of Experiments:

1. Introduction to transmission media(CAT5, OFC, COAXIAL CABLE Wireless)
2. Introduces network interfaces(Wired and Wireless)
3. Configure and installing a Ethernet(10/100)
4. Performance evaluation of Ethernet(10/100)
5. Topology design(Ring, Bus)
6. Generation of data packet and measurement(CBR, VBR, Poison)
7. Implement the following:
 - a) Router configuration
 - b) Switch configuration
 - c) Server configuration
8. Congestion control of network and QoS of network
9. Protocols and the configuration
10. Security (WEP, WPA) and Qualnet.

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