Telephone No. 2419677/2419361
Fax: 0821-2419363/2419301

e-mail : registrar@uni-mysore.ac.in
www.uni-mysore.ac.in

UNIVERSITY OF MYSORE

Estd. 1916

VishwavidyanilayaKaryasoudha
Crawford Hall, Mysuru- 570 005

No.AC2(S)/55/2024-25 Dated: 20.07.2024

Notification

Sub:- Modification of the Syllabus and Scheme of Examinations of Information Technology And Multimedia (CIST) (PG) programme from the Academic year 2024-25.

Ref:-1. Decision of Board of Studies in Information Technology and Multimedia (CIST) (PG) meeting held on 08-06-2024.
2. Decision of the Faculty of Science & Technology meeting held on 19-06-2024.
3. Decision of the Academic Council meeting held on 28-06-2024.

*****

The Board of Studies in Information Technology and Multimedia (CIST) (PG) which met on 08-06-2024 has resolved to recommend & approved the Modified Syllabus and Scheme of examinations of Information Technology and Multimedia (CIST) (PG) programmewith effect from the Academic year 2024-25.

The Faculty of Science & Technology and Academic Council at their meetings held on 19-06-2024 and 28-06-2024 respectively has also approved the above said modified Syllabus and Scheme of examinations hence it is hereby notified.

The Syllabus and Scheme of Examinations content may be downloaded from the University Website i.e., www.uni-mysore.ac.in.

Registrar

Registrar
University of Mysore
Mysore

To;

1. The Registrar (Evaluation), University of Mysore, Mysuru.
2. The Chairman, BOS/DOS in Information Technology and Multimedia (CIST) MGM.
3. The Dean, Faculty of Science & Technology, DOS in Mathematics, MGM.
4. The Director, Distance Education Programme, Moulya Bhavan, Manasagangotri, Mysuru.
5. The Director, PMEB, Manasagangothri, Mysore.
6. Director, College Development Council, Manasagangothri, Mysore.
7. The Deputy Registrar/Assistant Registrar/Superintendent, Administrative Branch and Examination Branch, University of Mysore, Mysuru.
8. The PA to Vice-Chancellor/ Registrar/ Registrar (Evaluation), University of Mysore, Mysuru.
9. Office Copy.

UNIVERSITY OF MYSORE

REGULATIONS AND SYLLABUS

FOR

M. Sc. IN
INFORMATION TECHNOLOGY
(M.Sc.IT)

CHOICE BASED CREDIT SYSTEM

EFFECTIVE FROM THE ACADEMIC YEAR 2024-25

UNIVERSITY OF MYSORE

REGULATIONS AND SYLLABUS FOR THE PROGRAM
M.Sc. IN INFORMATION TECHNOLOGY (M.Sc.IT)

SEMESTER SCHEME - CHOICE BASED CREDIT SYSTEM (CBCS)

Effective from the Academic Year 2024-25

Regulations: The existing regulations governing the Postgraduate Degree (Science) courses of the University of Mysore are applicable to this course.

Eligibility for admission to M.Sc.IT: B. Sc degree with Computer Science or Mathematics as one of the optional/Any degree with Diploma in Computer Application/B.Sc degree with Computer Application subject as one the optional/Post Graduate Diploma in Software Development, Post Graduate Diploma in Multimedia Technology/ B.C.A/ B.Tech/ B.E in any discipline with minimum of 45% marks in aggregate (40% in case of SC/ST and Cat-1). The selection of candidates for this course will be based on entrance test.

Duration: Two years (Four Semester)

Faculty: Science and Technology

PROGRAM OBJECTIVES:

- During the last decade, the rate of change in information technology has increased. Indeed it is clear that we are now entering an era where explosive change in Information technology combined with ever increasing computing power will lead to profound changes in information systems that support the organizations.

- Managing with Information Technology and Systems, Introduction and diffusion of Information Technology, Strategic impact of Information Technology, Economics of Information Science, New Information Technologies and their impact on Organizations, human factors in information systems.
- Studying Information Technology is to gain the knowledge of the Problem Solving, Data Modeling; Database Management Systems, Data Mining, Object Oriented Design Methodologies, System Design Methodologies, Artificial Intelligence, Electronic data interchange, Internet and WWW Applications.

PROGRAM OUTCOMES:

- Graduates will acquire the knowledge about current technology, trends, designing, developing, implementing, support or management of computer based information systems particularly software applications and computer hardware.

- Graduates will able to demonstrate basic knowledge in the areas such as, Software Engineering, Data communication and Networking, Database management System, Web Technology and Operating Systems for building Information Technology applications.

- Graduates will be able to deploy application software through mini-projects and will inculcate the skills of communication proficiently.

CREDIT PATTERN

SL NO	PAPER TYPE	CREDIT	CBCS REGULATION
1	HARDCORE (HC) INCLUDING PROJECT	48	A minimum of 42, Core but not exceeding 52
2	SOFTCORE (SC)	24	A minimum of 16
3	OPEN ELECTIVE (OE)	04	A minimum of 04
TOTAL		76	

PROGRAM STRUCTURE

FIRST SEMESTER

EXISTING PROGRAM STRUCTURE						MODIFIED PROGRAM STRUCTURE					REMARKS
SL NO.	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	SL NO.	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	
HARDCORE						**HARDCORE**						
1	Computer Organisation and Architecture	**3**	**1**	**0**	**4**	1	Computer Organisation and Architecture	**3**	**1**	**0**	**4**	**No Change**
2	Problem Solving and Programming in C	**2**	**0**	**2**	**4**	2	Problem Solving and Programming in C	**2**	**0**	**2**	**4**	**No Change**
3	Data Structures and Algorithms	**2**	**0**	**2**	**4**	3	Discrete Mathematics	**3**	**1**	**0**	**4**	**No Change**
4	Discrete Mathematics	**3**	**1**	**0**	**4**	-	-	-			-	.
SL NO	**SOFTCORE**					**SL NO**	**SOFTCORE**					
5	Web Technologies	**2**	**0**	**2**	**4**	**5**	Computer Graphics	**3**	**0**	**1**	**4**	**Shifted from II Sem**
6	IoT	**3**	**0**	**1**	**4**	**6**	Internet of Things (IoT)	**3**	**0**	**1**	**4**	**No Change**
7	E-Commerce	**3**	**1**	**0**	**4**	**7**	E-Commerce and Enterprise Resource Planning (ERP)	**3**	**1**	**0**	**4**	**Title is Modified**
TOTAL CREDITS=24						**TOTAL CREDITS=20**						

SECOND SEMESTER

EXISTING PROGRAM STRUCTURE						MODIFIED PROGRAM STRUCTURE					REMARKS
SL NO.	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	SL NO	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	
HARDCORE						**HARDCORE**						
1	DBMS	**2**	**0**	**2**	**4**	1	Data Structures and Algorithms	**2**	**0**	**2**	**4**	**Shifted from I Sem**
2	Operating System	**3**	**0**	**1**	**4**	2	Operating System	**3**	**1**	**0**	**4**	**No Change**
3	Mobile computing and its Applications	**2**	**1**	**1**	**4**	3	Java Programming	**2**	**0**	**2**	**4**	**Shifted from III Sem**
4	Python Programming	**2**	**0**	**2**	**4**	-	-	-			-	.
SL NO	**SOFTCORE**						**SOFTCORE**					
5	Probability and Statistics	**3**	**1**	**0**	**4**	**5**	Web Technologies	**2**	**0**	**2**	**4**	**Shifted from I Sem**
6	Computer Graphics	**2**	**0**	**2**	**4**	**6**	Data Communication and Computer Networks	**3**	**0**	**1**	**4**	**Shifted from III Sem**
7	ERP	**3**	**1**	**0**	**4**	**7**	Communication and Soft Skills	**3**	**1**	**0**	**4**	**New Subject Added**
TOTAL CREDITS=24						**TOTAL CREDITS=20**						

THIRD SEMESTER

EXISTING PROGRAM STRUCTURE						MODIFIED PROGRAM STRUCTURE					REMARKS
SL NO	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	SL NO	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	
HARDCORE						**HARDCORE**						
1	Cloud Computing	**3**	**1**	**0**	**4**	1	Cloud Computing	**3**	**0**	**1**	**4**	**No change**
2	Object Oriented Programming in JAVA	**2**	**0**	**2**	**4**	2	Python Programming	**2**	**0**	**2**	**4**	**Shifted from II Sem**
3	Data Communication and Computer Networking	**3**	**0**	**1**	**4**	3	Database Management System(DBMS)	**3**	**0**	**1**	**4**	**Shifted from II Sem**
4	.NET Technologies	**2**	**0**	**2**	**4**	**-**	**-**	**-**			**-**	**.**
SL NO.	**SOFTCORE**						**SOFTCORE**					
5	Artificial Intelligence	**3**	**1**	**0**	**4**	5	Artificial Intelligence	**3**	**1**	**0**	**4**	**No Change**
6	Software Project Management	**3**	**1**	**0**	**4**	6	Mobile Computing and its Applications	**3**	**0**	**1**	**4**	**Shifted from II Sem**
7	Cyber laws and Network Security	**3**	**1**	**0**	**4**	7	Software Project Management & Documentation	**3**	**1**	**0**	**4**	**No Change**
TOTAL CREDITS=24						**TOTAL CREDITS=20**						

Note: The students are advised to take one Open Elective(OE) course offered by other departments/SWAYAM and one Softcore(SC) offered in the department in the Third Semester.

FOURTH SEMESTER

EXISTING PROGRAM STRUCTURE						MODIFIED PROGRAM STRUCTURE					REMARKS
SL NO.	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	SL NO	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	
HARDCORE						**HARDCORE**						
1	PROJECT	**0**	**2**	**6**	**8**	1	PROJECT	**0**	**2**	**6**	**8**	**No Change**
2							Data Mining	**3**	**0**	**1**	**4**	**New Subject Added**
SOFTCORE						**SOFTCORE**						
2	-		**-**		**-**	2	**.**NET Technology	**2**	**0**	**2**	**4**	**Shifted from III Sem**
4							Cryptography and Network Security	**3**	**1**	**0**	**4**	**New Subject Added**
3	-		**-**		**-**	3	-	**-**	**-**	**-**	**-**	**-**
TOTAL CREDITS=08						**TOTAL CREDITS=16**						

OPEN ELECTIVE OFFERED FOR OTHER DEPARTMENT STUDENTS

EXISTING OPEN ELECTIVE PROGRAM STRUCTURE						MODIFIED OPEN ELECTIVE PROGRAM STRUCTURE						REMARKS
SL NO	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	SL NO	TITLE OF THE PAPER	CREDIT PATTERN L	T	P	CREDIT VALUE	
1	Web Designing	**2**	**0**	**2**	**4**	1	No Change					
2	Multimedia Technologies	**2**	**0**	**2**	**4**	2	Basics of Information Technology	**2**	**0**	**2**	4	New Subject Added

DETAILED SYLLABUS FOR
M.Sc. IN INFORMATION TECHNOLOGY

FIRST SEMESTER

SL. NO.	EXISTING SYLLABUS	MODIFIED SYLLABUS	PERCENTAGE OF CHANGE IN SYLLABUS
1	**COMPUTER ORGANISATION AND ARCHITECTURE (HC)** **UNIT-1** Basic of computer, Generation of computer, classification of computers, Von Neumann architecture, Micro operations, Register Transfer Micro operations, arithmetic micro operations, logic micro operations, shift micro operations, floating point arithmetic operations. **UNIT-2** Computer registers, computer instructions, register transfers, instruction execution, instruction cycle, instruction format-3 address, two addresses, single address and zero address, addressing modes, data transfer and manipulation, stack organisation, Timing and control, processor bus organisation, input and output devices, central processing unit. **UNIT-3** RISC and CISC machine characteristics, data transfer and manipulation, memory hierarchy, main memory, cache memory, virtual memory, address space and memory space, associate memory, multi-port memory, interconnection structure time shared common bus, characteristics of multiprocessors. **UNIT-4** Types of parallel processor systems, pipelining, clusters, cluster configuration, crossbar switch, mainframe and mini	**1. COMPUTER ORGANISATION AND ARCHITECTURE (HC)** **UNIT-1** Basics of computer, Generation of computer, classification of computers, Von Neumann architecture, Input-Output Organization Accessing Input/Output devices; Interrupts; Data transfer schemes - programmed I/O and DMA transfer; data transfer schemes for microprocessors. **UNIT - 2** CPU Organization CPU Building Blocks, CPU Registers and BUS Characteristics, Registers and System Bus Characteristics; Instruction Format; Addressing Modes; Interrupts: Concepts and types; Instruction and Execution Interrupt cycle; Hard wired and Micro Program control; Introduction to RISC and CISC. **UNIT - 3** Memory Unit Memory Hierarchy; Primary memory, Secondary Memory : Magnetic Tape, Magnetic Disk, Optical disk, Magneto-Optical Disk; Concepts of auxiliary, Associative, Cache And Virtual Memory, sequential access, direct access storage devices. **UNIT - 4** Multi-Processor Organization Parallel	**25**

	computers, wearable computers, the future of computer architecture, Laptop configuration, i3,i5,i7 processor advantages and disadvantages.	Processing, Concept and Block Diagram, Types (SISD, SIMD, Interconnect network, MIMD, MISD), Future Directions for Parallel Processors, Performance of Processors. Pipelining Data Path, Time Space Diagram, Hazards. Instruction Pipelining, Arithmetic Pipelining. ***Reference sources:*** 1) Carl Hamacher, Zvonks Vranesic, SafeaZaky (2002), Computer Organization, 5th edition, McGraw Hill, New Delhi, India. 2) Mohamed Rafiquzzaman and Rajan Chandra (2005): Modern Computer Architecture. Golgotia Publications Pvt.Ltd. 2) William Stallings (2010), Computer Organization and Architecture- designing for performance, 8th edition, Prentice Hall, New Jersy. 3) Anrew S. Tanenbaum (2006), Structured Computer Organization, 5th edition, Pearson Education Inc. 4) Computer System Architecture- M. Moris Mano (PHI publication) 5) Computer Organisation and architecture- Pal Chaudhary. 6) Vincent P. Heuring, University of Colorado, Boulder, Harry F.Jordan, Late. of the University of Colorado, Boulder Computer System Design and Architecture: Pearson Prentice Hall.	
2	**PROBLEM SOLVING AND PROGRAMMING IN C (HC)**	**2. PROBLEM SOLVING AND PROGRAMMING IN C (HC)** NO CHANGE	**NIL**

3	**DATA STRUCTURES AND ALGORITHMS (HC)**	**3. DATA STRUCTURES AND ALGORITHMS (HC)** SHIFTED TO SECOND SEM & NO CHANGE IN THE SYLLABUS	**NIL**
4	**DISCRETE MATHEMATICS (HC)**	**4.DISCRETE MATHEMATICS (HC)** NO CHANGE	**NIL**
5	**WEB TECHNOLOGIES (SC)**	**5. WEB TECHNOLOGIES (SC)** SHIFTED TO SECOND SEM & NO CHANGE IN THE SYLLABUS	**NIL**
6	**INTERNET OF THINGS (IOT)-(SC)**	**6. INTERNET OF THINGS (IOT)-(SC)** NO CHANGE	**NIL**
7	**E-COMMERCE (SC)** **UNIT-1** Introduction to E-commerce, Evolution of E-commerce: History of E-commerce, Advantages and Disadvantage of E-commerce, E-commerce Infrastructure: Hardware, Software, Network, Website. Managing the e-Enterprise: e-business Enterprise, Comparison between Conventional Design and e-organisation, Organisation of Business in an e-Enterprise. **UNIT-2** E-Commerce Process Models: Business Models, E-business Models Based on the Relationship of Transaction Parties, e-commerce Sales Life Cycle (ESLC) Model. The Life Cycle of Site Building-From Page to Stage, Building a Web Site, E-Commerce B2B Models and B2B Tools. Electronic Data Interchange (EDI): Meaning of EDI, History of EDI, EDI Working Concept, Implementation difficulties of EDI, Financial EDI, EDI and Internet.	TITLE IS MODIFIED AS **7. E-COMMERCE AND ENTERPRISE RESOURCE PLANNING (ERP)-(SC)** **UNIT-1** Introduction to E-commerce, Advantages and Disadvantage of E-commerce, E-commerce Infrastructure: Hardware, Software, Managing the e-Enterprise: Comparison between Conventional Design and E-organisation, Organisation of Business in an e-Enterprise. **UNIT-2** E-Commerce business Models, e-commerce Sales Life cycle (ESLC) Model. The Life cycle of Site Building-From Page to Stage, Building a Web Site, E-Commerce B2B Models. Electronic Data Interchange (EDI), Online Shopping, The E-Cycle of Internet Marketing, Attracting customers to your site. Electronic Payment Systems, Risks associated with Internet and Transactions, Management of risk, Online Shopping, Marketing on the internet.	**7**

	UNIT-3 E-Marketing: B2C and B2B Marketing, Branding Strategies, Advertising, E-Commerce Retailing & Services, Social Networking, Communities, & Actions. Marketing on the Internet: Online Shopping, Internet Marketing Techniques. The E-Cycle of Internet Marketing, Attracting customers to your site. Electronic Payment Systems, Requirements for Internet-Based Payments, Electronic Payment Media - Electronic Cash, Credit cards, Debit cards and Smart Cards. **UNIT-4** Electronic Payment Systems: Risks associated with Internet and Transactions, Management of Risk: Disaster Recovery Plans, Risk Management Paradigm. Security in cyberspace, designing for security, Virus: Security Protection and Recovery. Digital Signature. Future Directions: Software Agents. E-Commerce & Ethics. Roadmap of e-commerce in India.	**UNIT-3** Introduction Business Intelligence , E-Commerce and E-Business, Business Process Reengineering, Implementation Challenges, Strategies, Life Cycle, Pre-implementation Tasks, Requirements Definition-Methodologies, Package selection, Project Teams – Process Definitions, Vendors and Consultants, Data Migration, Project management– Post Implementation Activities. Role of ERP in Purchasing, Purchase Module: Features of purchase module; Benefits of purchase module, ERP Purchase System. **UNIT-4** Finance, Sales and Distribution, Manufacturing and Production Planning- Material and Capacity Planning; Shop Floor Control; Quality Management; JIT/Repetitive Manufacturing; Cost Management, Role of ERP in Finance, Accounting and Finance Processes: Cash management; Capital budgeting, Features of ERP Financial Module, Benefits of ERP Financial Module. Quality Management - Functions of Quality Management; CAQ and CIQ; Latest ERP Implementation Methodologies. ***References Sources:*** 1. Bhatia, V. (2000). E-Commerce (Includes E-Business). *New Delhi: Khanna Book*. 2. Gupta, M. P. (2004). Promise of e-Governance: operational challenges. 3. Kalakota, R., & Whinston, A. B. (1997). *Electronic commerce: a manager's guide*. Addison-Wesley	

		Professional. 4. Laudon, K. C., & Traver, C. G. (2016). *E-commerce: business, technology, society*. 5. Lee, J. K., Liang, T. P., Turban, D. C., Turban, E., & King, D. (2015). Electronic Commerce: A Managerial and Social Networks Perspective. 6. Minoli, D., & Minoli, E. (1997). *Web commerce technology handbook*. McGraw-Hill School Education Group. 7. Rosenborg, V. (2005). *PayPal for dummies*. Wiley. 8. Whiteley, D. (2000). *E-commerce: strategy, technologies and applications*. McGraw- Hill Publishing Company. 9. Bradford, M. (2014). *Modern ERP: select, implement, and use today's advanced business systems*. Lulu. com. 10. Leon, A. (2008). *ERP demystified*. Tata McGraw-Hill Education. 11. Leon, A. (2014). *Enterprise resource planning*. McGraw-Hill Education. 12. Monk, E., & Wagner, B. (2012). *Concepts in enterprise resource planning*. Cengage Learning. 13. Shields, M. G. (2004). *E-business and ERP: Rapid implementation and project planning*. John Wiley & Sons.	

SECOND SEMESTER

SL. NO.	EXISTING SYLLABUS	MODIFIED SYLLABUS	PERCENTAGE OF CHANGE IN SYLLABUS
1	**DBMS (HC)**	**1. DATABASE MANAGEMENT SYSTEM (DBMS) (HC)** SHIFTED TO III SEM, NO CHANGE IN THE SYLLABUS	**NIL**
2	**OPERATING SYSTEM (HC)**	**2. OPERATING SYSTEM (HC)** NO CHANGE	**NIL**
3	**MOBILE COMPUTING AND ITS APPLICATIONS (HC)** **UNIT-1** Introduction: Current Wireless Systems: Overview of Paging Systems, Cordless Phones, Cellular Telephone Systems, Satellite Communication, Wireless LANs, Blue tooth. Medium access control, Telecommunication Systems – SDMA, TDMA, CDMA, GSM. **UNIT-2** Mobile computing through Internet- Mobile-enabled Applications, Mobile Applications – Multichannel and Multi modal user interfaces – Synchronization and replication of Mobile Data - SMS architecture, GPRS – Mobile Computing through Telephony - Synchronization protocol. **UNIT-3** Wireless LAN – IEEE 802.11 –Infrared vs Radio Transmission, Infrastructure Networks, Ad-hoc Networks, Bluetooth Wireless ATM,	**3. MOBILE COMPUTING AND ITS APPLICATIONS (HC)** SHIFTED TO III SEM **UNIT-1** Introduction to Current Wireless Systems, Mobile Computing — Applications of Mobile Computing- Generations of Mobile Communication Technologies- Multiplexing — Spread spectrum - MAC Protocols — SDMA- TDMA- FDMA- CDMA. **UNIT-2** Mobile computing through Internet- Mobile-enabled Applications, Mobile Applications – Multichannel and Multi modal user interfaces – Synchronization and replication of Mobile Data - SMS architecture, GPRS – Mobile Computing through Telephony - Synchronization protocol. **UNIT-3** Wireless LAN – IEEE 802.11 – Infrared vs Radio Transmission, Infrastructure Networks, Ad-hoc Networks, Bluetooth Wireless ATM,	**20**

	Radio Access Layer, Handover, Location Management, Addressing Mobile Quality of Service, Access Point, Control Protocol. Mobile Communication: Wireless Transmission – Medium Access Control – Telecommunication Systems – Satellite Systems – Broadcast system – Wireless LAN. **UNIT-4** MAC protocol – Routing protocols - Transport Layer Protocol-QOS-Energy Management. Overview of Cellular IP-Options of Cellular IP -Key, Mechanism in Cellular IP-route Optimization. Overview of TCP/IP-Structure of TCP/IP. Advert-Hoc Primary ideas – Traits Purposes.	Radio Access Layer, Handover, Location Management, Addressing Mobile Quality of Service, Access Point, Control Protocol. Mobile Communication: Wireless Transmission – Medium Access Control – Telecommunication Systems – Satellite Systems – Broadcast system – Wireless LAN. **UNIT-4** Mobile TCP-WAP-Architecture Mobile Device Operating Systems, Special Constraints & Requirements- Commercial Mobile Operating Systems- Software Development Kit: iOS, Android, BlackBerry, Windows Phone-M-Commerce-structure-Pros & Cons - Mobile Payment System-Security Issues. ***Reference Sources:*** 1. Adelstein, F., Gupta, S. K., Richard, G., & Schwiebert, L. (2005). Fundamentals of mobile and pervasive computing (Vol. 1). New York: McGraw-Hill. 2. Burkhardt, J., Schaeck, T., Henn, H., Hepper, S., & Rindtorff, K. (2001). Pervasive computing: technology and architecture of mobile Internet applications. Addison- Wesley Longman Publishing Co., Inc. 3. Karahoca, A. (Ed.). (2012). Advances and Applications in Mobile Computing. BoD– Books on Demand. 4. Pattnaik, P. K., & Mall, R. (2015). Fundamentals of Mobile Computing. PHI Learning Pvt. Ltd.. 5. Talukdar, A. K. (2010). Mobile Computing, 2E. Tata McGraw-Hill Education.	

4	**PYTHON PROGRAMMING (HC)** **UNIT-1** Introduction: What is a Program, The Python Programming Language, History, features, Installing Python, Running a Python program, the first program, Arithmetic operators, Variables, data types and Operators. Conditional Statements, Looping, String Manipulation. **UNIT-2** Lists- Introduction, Accessing list, Operations, Working with lists, Function and Methods. Tuple- Introduction, Accessing tuples, Operations. Dictionaries, Regular Expressions. **UNIT-3** Input-Output- Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files. Functions- Defining a function, Calling a function, Types of functions. **UNIT-4** Classes and objects, Classes and functions, Classes and methods.	**4. PYTHON PROGRAMMING (HC)** SHIFTED TO III SEM **UNIT-1** **Introduction** to Python, Python **Basics** Data Types, Operations on Data Types, Data Type Conversions, Basic I/O, Basic Formatting Python, Input and output functions, **Control Structures** Decisions, Loops , Operators: Operators, String handling functions and String Manipulation. **UNIT- 2** Data structures in python: Lists- Introduction, Accessing list, Operations, Working with lists, Function and Methods. Tuple- Introduction, Accessing tuples, Operations. Dictionaries, Regular Expressions. **UNIT-3** **Object Oriented Programming:** OOP Concepts, Class Definitions, Class Instantiation, Class and Instance Variables, Class Functions and Instance Methods, Constructors and Destructors, Inheritance. **UNIT-4** Exception Handling, Exceptions, Raising Exceptions, Exception Propagation, User-Defined Exceptions. File handling: Reading From Text Files, Writing to Text Files, Reading from Binary Files, Writing to Binary Files, Seeking Within Files. Introduction to numpy, pandas, frames. ***Reference Sources:*** 1. Ascher, D., & Lutz, M. (1999). Learning Python. O'Reilly. 2. Beazley, D. M. (2009). Python essential reference. Addison-Wesley Professional. 3. Brown, F., & George, P. (2001). Python: the complete reference. Brown: 2001. 4. Chun, W. (2001). Core python	**25**

		programming (Vol. 1). Prentice Hall Professional. 5. Lutz, M. (2014). Python Pocket Reference: Python In Your Pocket. " O'Reilly Media, Inc.". 6. Van Rossum, G., & Drake, F. L. (2011). The python language reference manual. Network Theory Ltd. 7. Dr. R Nageshwar Rao-Core Python Programming: Dreamteach Press. 8. Martin C Brown: The Complete reference Python.	
5	**PROBABILITY STATISTICS (SC)**	**5.PROBABILITYSTATISTICS(SC)** REMOVED	**NIL**
6	**COMPUTER GRAPHICS (SC)**	**6. COMPUTER GRAPHICS (SC)** SHIFTED TO FIRST SEM & NO CHANGE IN SYLLABUS	**NIL**
7	**ERP (SC)**	**ERP (SC)** REMOVED AND NEW PAPER ADDED **7. PAPER TITLE: COMMUNICATION AND SOFT SKILLS** **UNIT 1:** Definition of Communication, Importance of Communication, Process of Communication, Objectives of Communication, Barriers to effective Communication, Practice of pronunciation and listening skills, Vocabulary building, Public speaking, Extempore: method and practice, Group discussion: method and practice, Mock interview: types of interview, preparation and common questions, Curriculum vitae/ resume writing. **UNIT 2:** Direction of Communication: Downward, Upward, Lateral or Horizontal, Diagonal, Grammar: Articles, Preposition, Verbs, Tenses, Part of speech, Auxiliary, Vocabulary Words. **UNIT 3:** Introduction to soft skills Meaning, Predictability Soft Skills as a competitive weapon Making formal presentation. Listening skills Self Confidence and courage Problem solving Leadership,	**100**

		Teamwork & Interpersonal Skill Understanding the role of teams in organizations. **UNIT 4:** Defining types of groups, teams ensuring team success, becoming a high performing team, difference between teams and groups. Work ethic and commitment maintaining a professional workspace managing time and managing stress, taking advantage of professional opportunities. ***Reference Sources:*** 1. Ascher, D., & Lutz, M. (1999). Learning Python. O'Reilly. 2. Beazley, D. M. (2009). Python essential reference. Addison-Wesley Professional. 3. Brown, F., & George, P. (2001). Python: the complete reference. Brown: 2001. 4. Chun, W. (2001). Core python programming (Vol. 1). Prentice Hall Professional. 5. Lutz, M. (2014). Python Pocket Reference: Python In Your Pocket. " O'Reilly Media, Inc.". 6. Van Rossum, G., & Drake, F. L. (2011). The python language reference manual. Network Theory Ltd.	

THIRD SEMESTER

SL. NO.	EXISTING SYLLABUS	MODIFIED SYLLABUS	PERCENTAGE OF CHANGE IN SYLLABUS
1	**CLOUD COMPUTING (HC)** **UNIT-1** Cloud Computing definition, private, public and hybrid cloud. Cloud types: IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits	**1. CLOUD COMPUTING (HC)** **UNIT-1** Cloud Computing definition, private, public and hybrid cloud. Cloud types: IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public and private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. application availability, performance, security and disaster recovery, next generation Cloud applications.	

	and challenges to Cloud architecture. Application availability, performance, security and disaster recovery, next generation Cloud applications. **UNIT-2** Cloud Services Management: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics: Cloud Computing infrastructures available for implementing cloud based services. Economics of choosing a Cloud platform for an organization, based on application. **UNIT-3** Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages. **UNIT-4** Analysis of Case Studies when deciding to adopt cloud computing architecture. How to decide if the cloud is right for your requirements. Cloud based service.	**UNIT-2** Cloud Services Management: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics: Cloud Computing infrastructures available for implementing cloud based services. **UNIT-3** Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages. **UNIT-4** Cloud Applications – Moving Applications to the Cloud – Microsoft Cloud Services – Google Cloud Applications – Amazon Cloud Services – Cloud Applications. ***Reference sources:*** 1. Velte, T., Velte, A., & Elsenpeter, R. (2009). Cloud computing, a practical approach. McGraw-Hill, Inc.. 2. Miller, M. (2008). Cloud computing: Web-based applications that change the way you work and collaborate online. Que publishing. 3. Beard, H. (2008). Cloud Computing Best Practices for Managing	**10**

		and Measuring Processes for On-demand Computing, Applications and Data centers in the Cloud with SLAs. Emereo Pty Ltd. 4. Polze, A. (2009). A comparative analysis of cloud computing environments. Hasso- Plattner-Institute for Software Engineering, Tech. Rep. 5. Talukder, A. K., & Zimmerman, L. (2010). Cloud economics: Principles, costs, and benefits. In Cloud computing (pp. 343-360). Springer, London.	
2	**OBJECT ORIENTED PROGRAMMING IN JAVA (HC)**	TITLE MODIFIED AS **2. JAVA PROGRAMMING (HC)** NO CHANGE IN THE SYLLABUS	**5**
3	**DATA COMMUNICATION AND COMPUTER NETWORKING (HC)** **UNIT-1** Introduction: Data Communications, Networks, The Internet, Protocols and Standards, Network Models, Layered Tasks, The OSI Model, Layers in the OSI Model, TCP/IP Protocol Suite, Addressing, Physical Layer and Media, Data and Signals, Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission impairment, Data Rate Limits, Performance, Digital Transmission, Digital-to-Digital Conversion, Analog-to-Digital Conversion, Analog Transmission, Digital-to-analog Conversion, Analog-to-analog Conversion. **UNIT-2** Bandwidth utilization: Multiplexing and Spreading, Multiplexing, Spread Spectrum, Network Topologies: Bus, Star, Ring, Tree and Mesh topologies.	TITLE MODIFIED AS **3. DATA COMMUNICATION AND COMPUTER NETWORKS (HC)** **UNIT-1** Introduction: Data Communications, Networks, Network Types, Internet History, Standards and Administration Networks Models: Protocol Layering, TCP/IP Protocol suite, The OSI model Introduction to Physical Layer-1: Data and Signals, Digital Signals, Transmission Impairment, Data Rate limits, Performance Digital Transmission: Digital to digital conversion (Only Line coding: Polar, Bipolar and Manchester coding). **UNIT-2** Network Topologies: Bus, Star, Ring, Tree and Mesh topologies. Wired Transmission Media, Magnetic Media, Twisted Pairs, Coaxial Cable, Power Lines, Fiber Optics, Wireless	**5**

	Wired Transmission Media, Magnetic Media, Twisted Pairs, Coaxial Cable, Power Lines, Fiber Optics, Wireless Transmission Media, Radio Frequencies, Microwave Frequencies, Infrared Waves. Network technologies: Local Area Network Technologies, Ethernet Technologies, Ethernet Versions, Token Ring Technologies, Wide Area Network Technologies. **UNIT-3** Error Detection and Correction, Introduction, Block Coding, Liner Block Codes, Cyclic Codes, Checksum, Data Link Control, Framing, Flow and Error Control, Protocols, Noiseless Channels. Network Layer: Logical Addressing, IPv4 Addresses, IPv6 Addresses, Network Layer: Internet Protocol, Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6, Network Layer: Address Mapping, Error Reporting and Multicasting, Address Mapping, ICMP, IGMP, ICMPv6. **UNIT-4** Multiple Access Protocols: CSMA/CA,CSMA/CD, Switching, Circuit-Switched Networks, Datagram Networks, Virtual-Circuit Networks, Structure of a Switch, Transport Layer: Process-Process Delivery: UDP, TCP and SCTP, Process-to-Process Delivery, User Datagram Protocol (UDP),Domain Name System, Electronic mail, FTP,WWW and HTTP, Network Security, Satellite Communication.	Transmission Media, Radio Frequencies, Microwave Frequencies, Infrared Waves. Network technologies: Local Area Network Technologies, Ethernet Technologies, Ethernet Versions, Token Ring Technologies, Wide Area Network Technologies. **UNIT-3** **Error Detection and Correction:** Introduction, Block coding, Cyclic codes, Checksum, Forward error correction. **Data link control:** DLC services, Data link layer protocols, HDLC, and Point to Point protocol (Framing, Transition phases). **UNIT-4** CSMA/CA,CSMA/CD, Switching, Circuit-Switched Networks, Datagram Networks, Virtual-Circuit Networks, Structure of a Switch, Transport Layer: Process-Process Delivery: UDP, TCP and SCTP, Process-to-Process Delivery, User Datagram Protocol (UDP),Domain Name System, Electronic mail, FTP,WWW and HTTP, Network Security, Satellite Communication. Network layer Protocols: Internet Protocol. Next generation IP: IPv6 addressing, The IPv6 Protocol, The	

		ICMPv6 Protocol and Transition from IPv4 to IPv6. ***Reference Sources:*** 1.Beasley, J. S., & Nilkaew, P. (2012). Networking essentials. Indianapolis Ind.: Pearson. 2.Forouzan, B. A. (2013). Data communications and networking. New York, NY: McGraw-Hill. 3.Moussavi, M. (2011). Data Communication and Networking: A Practical Approach. Cengage Learning. 4.Sharma, S (2015). Data Communication and Computer Networks. S.K. Kataria & Sons; First Edition. 5.Stallings, W. (2006). Computer Networking With Internet Protocols and Technology. Beijing: Publishing House of Electronics Industry. 6.Tomsai, W. (2007). Introduction to data communication and networking (1st ed.). Place of publication not identified: New Central Book Agency. 7.White, C. M. (2011). Fundamentals of Networking and Data Communications. Course technology Cengage learning. 8.Behrouz A. Forouzan, Data Communications and Networking 5E, 5th Edition, Tata McGraw-Hill, 2013.	
4	**.NET TECHNOLOGY (HC)**	**4. .NET TECHNOLOGY(HC)** SHIFTED TO IV SEM NO CHANGE IN THE SYLLABUS	**NIL**
5	**ARTIFICIAL INTELLIGENCE (SC)**	**5. ARTIFICIAL INTELLIGENCE (SC)** NO CHANGE	**NIL**

6	**SOFTWARE PROJECT MANAGEMENT & DOCUMENTATION (SC)**	**7. SOFTWARE PROJECT MANAGEMENT & DOCUMENTATION (SC)** NO CHANGE	**NIL**
7	**CYBER LAWS & NETWORK SECURITY (SC)**	**8. CYBER LAWS & NETWORK SECURITY(SC)** REMOVED	**NIL**

FOURTH SEMESTER

SL. NO.	EXISTING SYLLABUS	MODIFIED SYLLABUS	PERCENTAGE OF CHANGE IN SYLLABUS
1	**PROJECT(HC)**	**1. PROJECT(HC)** NO CHANGE	**NIL**
		2. NEW PAPER ADDED **PAPER TILTE: DATA MINING(HC)** **UNIT-1** Importance of Data Mining, What is Data Mining, Data Mining – Types of Data, Data Mining Functionalities, Issues in Data Mining, Data Preprocessing: Types of Data, Need of preprocess data, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization. **UNIT-2** Data Warehouse and OLAP Technology: An overview –A multidimensional Data model, Data Warehouse Architecture, Data Warehouse implementation, Mining Frequent Patterns, Associations, and Correlations: Basic concepts, Efficient and scalable frequent item set mining , Mining various kind of Association rules. **UNIT-3** Classification and Prediction: Introduction, Issues regarding classification and Prediction, Classification by Decision Tree induction, Bayesian Classification Rule Based Classification, Classification by Backpropagation, Support Vector machines, Prediction, Accuracy and Error measures. **UNIT-4** Cluster Analysis: Introduction, Categorization of major clustering methods, Partitioning methods, Cluster Analysis, Hierarchical methods, Density Based methods, Outlier Analysis.	**100**

		Reference Sources: 1) Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Person Education, 2007. 2) K.P. Soman, Shyam Diwakar and V. Aja, "Insight into Data Mining Theory and Practice", Eastern Economy Edition, Prentice Hall of India, 2006. 3) G. K. Gupta, "Introduction to Data Mining with Case Studies", Eastern Economy Edition, Prentice Hall of India, 2006. 4) Daniel T.Larose, "Data Mining Methods and Models", Wiley-Interscience, 2006. Kamber and Han, "Data Mining Concepts and Techniques", Hartcourt India P. Ltd., 5) A Guide to Data Warehousing – Hochit 6) Data Warehousing in Real World – anahory 7) Data Mining – Addsiaans (Addison Wesley). **3. .NET TECHNOLOGIES(SC)** SHIFTED FROM III SEM NO CHANGE IN THE SYLLABUS **4. NEW PAPER ADDED:** **PAPER TITLE: CRYPTOGRAPHY AND NETWORK SECURITY(SC)** **UNIT - I:** Foundations of Computer Security- Introduction to Computer Security, Examples, the Challenges of Computer Security, the OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms and a Model for Network Security. **UNIT-2:** Cryptographic Techniques- Introduction to cryptography, basic concepts, Encryption and decryption, Symmetric and asymmetric key cryptography, Substitution techniques: mono alphabetic and poly alphabetic, Transposition techniques: Rail Fence Transposition, Columnar Transposition and Book Cipher/Running Key Cipher. **UNIT-3:** RSA, Diffie Hellman key exchange,	**100**

		random number generation, Data integrity and authentication Hash functions; MAC; Digital signatures; Cryptographic hashing and authentication mechanisms: Whirlpool, HMAC, CMAC. **UNIT-4:** Key management; Authentication, Web and system security, Web security; IP security; E mail security; System security-intruders, malicious software, firewalls . Web Threats and Countermeasures- Overview of browser security, Importance of securing browsers, Browser Attack Types. ***Reference Sources:*** 1. Charrles P. Pfleeger, Shari Lawrence Pfleegner, "Security in Computing", Prentice Hall of India, 2007. 2. William Stallings, "Cryptography and Network Security", 5th Edition, Pearson. 3. John W.Rittinghouse, James F.Ransome, "Wireless Operaional Security", Elsevier, 2004. 4. Ron Ben Natan,"Implementing Database Security and Auditing", Elsevier, 2005. 5. Lincoln D. Stein, "Web Security", Addison Wesley, 1999. 6. Ingemar J.Cox, Matthew L. Miller Jeffrey A.Bloom, Jessica Fridrich,Ton Kalker,"Digital Watermarking and Steganography", 2nd Edition, Elsevier. 7. Dr.R.K.Tiwari, P.K.Sastri, K.V.Ravikumar, " Computer Crime and Computer Forensics", 1st Edition, Selective Publishers, 2002.	

OPEN ELECTIVE OFFERED TO OTHER DEPARTMENT STUDENTS

SL. NO.	EXISTING SYLLABUS	MODIFIED SYLLABUS	PERCENTAGE OF CHANGE IN SYLLABUS
1	**WEB DESIGINING(OE)**	**1. WEB DESIGINING (OE)** NO CHANGE	**NIL**
2	**MULTIMEDIA TECHNOLOGIES(OE)**	**MULTIMEDIA TECHNOLOGIES(OE) REMOVED AND NEW PAPER ADDED** **2. PAPER TITLE:** **BASICS OF INFORMATION TECHNOLOGY(OE):** **UNIT-1** Introduction, Definition, .Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations of computer **UNIT-2** Introduction, Definition, .Characteristics of computer, Evolution of Computer, Block Diagram of a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations of computer. **UNIT-3** Software and its needs, Types of software's, Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Word Processing, spread Sheets, slide Presentation. **UNIT-4** Functions, Measuring System Performance, Assemblers, Compilers and Interpreters. Batch processing, multiprogramming, multi -tasking, Multiprocessing, Time Sharing, DOS, Internet, Applications of internet, web access, copying text, bookmarks, search engines, Websites, Ecommerce. ***Reference Sources:*** 1. Thomas C Bartee: Harvard University-Computer Architecture	**100**

		and Logic Design. 2. Ramesh Bangia-Computer Fundamentals and Information Technology: Published by Firewall Media. 3. D. S Rajenrda Prasad, M. A Jayaram-Basics of Computer Skills- A comprehensive Foundation on MS-Office Utilities. 4. Ramesh Bangia-Learning Computer Fundamentals: Published by Khanna B Bangia Co.Pvt.Lmt. 5. V.Rajaraman-Introduction to Information Technology:Published by Prenticehall of India Pvt.Lmt. 6. Encyclopedia of Computer Science by edited by Anthony Ralston, Edwin D. Reilly, David Hemmendinger. 7. World of Computer Science, 2 vols. by Brigham Narins, ed.	

n-gl.com