

SEMESTER 2

DC528T201: OPERATING SYSTEM CONCEPTS USING ANDRIOD		
Course Requisite: 1. Strong programming skills (Knowledge of C), elementary data structures and algorithms, computer architecture and an introduction to concurrency.		
Course Objective: 2. Introduces general idea, structure and functions of operating system. 3. Making students aware of basic mechanisms used to handle processes, memory, storage devices and files. 4. Recent trends in the operating system		
Course Outcome: After completion of the course students must be able to 1. Identify basic structure and purpose of operating system. 2. Understand the concepts of process and illustrate various CPU scheduling algorithms. 3. Interpret the concepts of inter process communication. 4. Schematize Deadlock & security mechanisms in operating systems. 5. Analyze different memory management techniques with advantages and disadvantages.		
	OPERATING SYSTEM CONCEPTS USING ANDRIOD	L
Unit-1:	Evolution of OS, Types of OS, Basic h/w support necessary for modern operating systems, services provided by OS, system programs and system calls, system design and implementation.	9
Unit-2:	Process & Its Scheduling Process concept, process control block, Types of scheduler, context switch, threads, multithreading model, goals of scheduling and different scheduling algorithms.	9
Unit-3:	Process management and synchronization: Concurrency conditions, Critical section problem, software and hardware solution, semaphores, conditional critical regions and monitors, classical inter process communication problems.	9
Unit-4 :	Deadlock definitions, Prevention, Avoidance, detection and Recovery, Goals of Protection, access matrix, Deadlock implementation	9
Unit-5:	Memory Management & File systems: Contiguous allocation, Relocation, Paging, Segmentation, Segmentation with paging, demand paging, Virtual Memory Concepts, page faults and instruction restart, page replacement algorithms, working sets, Locality of reference, Thrashing, Garbage Collection. File concept, Access methods space allocation strategies, disk arm scheduling strategies..	9
Text Books: Operating System concepts – Silberchatz; Galvin, Addison Wesley, 6 th Edn. Modern Operating Systems – Tanenbaum, Pearson Edn. 2 nd edn Operating Systems: Internals and Design Principles -- William Stallings		
References: Operating Systems – S R Sathe, Macmillan Publishers, India, 2008 Operating System –Milan Milenkovik, McGraw-Hill, 1987 Operating Systems - 3 rd Edition by Gary Nutt, Pearson Education.		

DC528T202: DATABASE MANAGEMENT SYSTEM		
<p>Course Requisite: Before you start proceeding with this subject, it is recommended that you have a good understanding of basic computer concepts such as primary memory, secondary memory, and data structures and algorithms.</p>		
<p>Course Objective:</p> <ol style="list-style-type: none"> 1. This course introduces general idea of database management system. 2. It is aimed at developing skills to design databases using data modeling and design techniques. 3. It is also aimed to developing skills to implement real life applications which involve database handling. 4. This course also provide carrier opportunities in subject areas of designing, storage techniques and data handling and managing techniques. 		
<p>Course Outcome: After completion of the course students must be able to</p> <ol style="list-style-type: none"> 1. Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms and design appropriate data model for it. 2. Demonstrate an understanding of various normalization forms and apply knowledge of normalization for creation of database. 3. Demonstrate SQL queries to perform CRUD (Create, Retrieve, Update, Delete) operations on database and perform inferential analysis of data model 4. Demonstrate query processing and able to design optimized query execution plan. 5. Perform basic transaction processing and management and ensure database security, integrity and concurrency control 		
	DATABASE MANAGEMENT SYSTEM	L
Unit-1:	Introduction to DBMS DBMS Architecture, Data Models, UML, Relational Database design: Functional Dependency (FD) – Basic concepts, closure of set of FD, closure of attribute set, Decomposition. Normalization – 1NF, 2NF, 3NF, BCNF, 4NF.	10
Unit-2:	SQL Concepts Basics of SQL, DDL, DML, DCL, structure – creation, alteration, defining constraints, Functions - aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All , view and its types. Transaction control commands – Commit, Rollback, Save point. Cursors, Stored Procedures, Stored Function, Database Triggers	10
Unit-3:	Query Processing & Query Optimization Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans, materialized views	8
Unit-4 :	Transaction Management Transaction concepts, properties of transactions, serializability of transactions, Two-Phase Commit protocol, Deadlock, two-phase locking protocol , NoSQL Databases - Introduction, CRUD Operations, Data Mining, XML	8
Unit-5:	Introduction To Big Data And Hadoop Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop,	9
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts 4th Ed, McGraw Hill, 2002. 2. Jeff Ullman, and Jennifer Widom, A First Course in Database systems, 2nd Ed 		

3. Tom White “ Hadoop: The Definitive Guide” Third Edit on, O’reily Media, 2012.
4. SeemaAcharya, SubhasiniChellappan, "Big Data Analytics" Wiley 2015.

References:

1. G. K. Gupta : Database Management Systemsll, McGraw – Hill.
2. Regina Obe, Leo Hsu, PostgreSQL: Up and Running, 3rd Ed, O'Reilly Media 2017.
3. Kristina Chodorow, Shannon Bradshaw, MongoDB: The Definitive Guide, 3rd Ed, O'Reilly Media 2018.
4. RamezElmasri and ShamkantNavathe, Fundamentals of Database Systems 2nd Ed, Benjamin Cummings, 1994.

DC528T203: DATA COMMUNICATION & NETWORKING

Course Requisite:

Before you start proceeding with this subject, I'm making an assumption that you are already aware about basic computer concepts like what is keyboard, mouse, monitor, input, output, primary memory and secondary memory etc.

Course Objective:

1. This course introduces student’s basics of data communication and networking while making them aware of functions of each layer in architecture.
2. The course provide career opportunities in design, implement, operate & manage enterprise work.
3. Understand advanced technique such as Data encoding and Compression.

Course Outcome:After completion of the course students must be able to

1. Understand Basics of data communications and Computer Networks
2. Identify the techniques involved in the data transfer process
3. Understand advanced technique such as Data encoding and Compression
4. Recognize the need for OSI reference Model in computer networking
5. Use different elementary protocols for communication and identify IEEE standards employed in Computer networking.

	DATA COMMUNICATION & NETWORKING	L
Unit-1:	Introduction Components, Networks, Protocols and standards, Basic Concepts: Line Configuration, Topology Transmission mode, analog and digital signals, periodic and aperiodic signals, analog signals, time and frequency domains, composite signals, digital signals.	9
Unit-2:	Encoding and modulating Digital –to- digital conversion, analog-to-digital conversion, digital to analog conversion, analog to analog conversion, digital data transmission, DTEDCE interface, modems, cable modems. Transmission media: guided media, unguided media, and transmission impairment. Performance, wavelength, Shannon capacity, media comparison.	9
Unit-3:	Multiplexing Many to one/ one to many, frequency division multiplexing, wave division multiplexing, TDM, multiplexing applications: the telephone system , Error detection and correction : types of errors, detection , VRC, Longitudinal redundancy check, cyclic redundancy check, checksum, error correction.	9
Unit-4 :	Data link Control Line Discipline, flow control, error control, Data link Protocols: Asynchronous Protocols, synchronous protocols, character oriented protocols, bit – oriented protocols, link access procedures.	9

Unit-5:	Local Area Networks Ethernet, other Ethernet networks, token bus, token ring, FDDI, Comparison, IEEE802.6 (DQDB) SMDS, Switching: circuit switching, packet switching, message switching, integrated services digital networks (ISDN): services, history, subscriber access to ISDN.	9
Text Books: Behrouz A. Forouzan: Data Communication and Networking, (2/e) (TMH)		
References: 1. William Stallings: Data & Computer Communications, 6/e, Pearson Education. 2. William L. Schweber : Data Communication, McGraw Hill. 3. J.Freey : Computer Communication & Networks, AEW Press. 4. D. Corner : Computer Networks & Internet, Pearson Education.		
DE528T204: SOFTWARE TESTING		
Course Requisite: 1. Any prerequisites or preconditions that must be fulfilled prior to executing the test.		
Course Objectives: 1. This course is designed to enable a clear understanding and knowledge of the foundations, techniques, and tools in the area of software testing and its practice in the industry. 2. To understand the broad approaches and techniques for test case design and the aspects involved in planning for software testing. 3. To learn strengths and weaknesses of various software testing techniques.		
Course Outcomes: After successfully completing the course, the students will be able to 1. Understand fundamentals of Software Testing 2. Formulate problem by following Software Testing Life Cycle. 3. Implement software testing by identifying specific type of software testing method. 4. Perform test case and document the same. 5. Understand and assure software quality by various software testing tools.		
	SOFTWARE TESTING	L
Unit-1:	Introduction to Software Testing Software testing fundamentals: What is a bug? Why do bugs occur? The cost of bugs. Goals of a software tester. Characteristics of s/w tester. Software development process: product component, software project staff, software development lifecycle model.	9
Unit-2:	Software Testing Mechanism The realities of s/w testing : testing axioms, s/w testing terms and definitions, Software Testing Life Cycle (STLC). Examining the specifications : Black box and white box testing, Static and dynamic testing, Static black box testing, Performing a high level review of the specification, low level specification test techniques. Testing the s/w with blinders on – Dynamic black box testing, Test to pass and test to fail, Equivalence partitioning, data testing, State testing, Other black box test techniques.	9
Unit-3:	Software Code Testing Examining the code : Static white box testing, Formal review, Coding standards and guidelines, Generic code review checklist. Testing the software with X-ray glasses: Dynamic white box testing, Dynamic white box testing versus debugging testing the pieces.	9

Unit-4 :	Software Testing types and Software Testing documentation Types of testing Configuration testing, Compatibility testing, Foreign language testing, Usability testing, Testing the documentation, Testing for software security	9
Unit-5:	Software Quality Assurance Test planning and quality assurance : Planning the test , Goal of test planning, Various test planning topics, Writing and tracking test cases, Goal of test case planning, Test case planning overview	9
Text Books: 1. Ron Patton, “Software Testing” SAMS Publishing 2. Marnei L. Hutcheson – “Software Testing Fundamentals: Methods and Metrics” WILEY Pub.		
References: 1. Pressman “Software Engineering” McGraw-Hill publications 2. StrinivasanDesikan and GopalswamiRamesh,”Software Testing – Principles and Practices” Pearsons		

DE528T205: CLOUD COMPUTING		
Course Requisite: The term Cloud Computing refers to a big area of Information Technology that involves: hardware infrastructures, software infrastructures, data center facilities, virtualization technologies, and software engineering concepts.		
Course Objective: 1. Understand the new technologies for resources sharing 2. Explain classification of Cloud deployment 3. Discuss capacity planning for cloud configuration 4. Understand Cloud service model		
Course Outcome: After completion of the course students must be able to 1. State the basics of distributed computing and cloud computing. 2. Summarize the technical capabilities and business benefits cloud technology. 3. Develop cloud-based application demonstrating its implications 4. Deploying Web services. 5. Frame Case Studies on cloud based computing solution.		
	CLOUD COMPUTING	L
Unit-1:	Introduction to Cloud Computing Virtualization Concepts, Cloud Computing Fundamental: Overview of Computing Paradigm, Evolution of cloud computing, Defining cloud computing, Components of a computing cloud, Essential Characteristics of Cloud Computing, Cloud Taxonomy.	9
Unit-2:	Infrastructure as a Service(IaaS), Platform as a Service(PaaS), Software as a Service(SaaS), Hardware-as-a-service: (HaaS), Oriented Architecture (SOA)	9
Unit-3:	Cloud Computing Architectural Framework Cloud architectural principles, Role of Web services, Benefits and challenges to Cloud architecture, Cloud Service Models, cloud computing vendors. Cloud Services, Management, Performance and scalability of services, tools and technologies used to manage cloud services deployment.	9
Unit-4 :	Cloud Application Development Role of business analyst, Technical architecture considerations, Service creation environments to develop cloud based applications	9

Unit-5:	Memory Management & File systems: Contiguous allocation, Relocation, Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages, Cloud Economics, Cloud Security and Risk Management Cloud Security. Case Studies :AWS/Azure	9
Text Books: 1. Kai Hwang, Geoffrey C. Fox and Jack J. Dongarra, —Distributed and cloud computing from Parallel Processing to the Internet of Things, Morgan Kaufmann, Elsevier – 2012 2. Barrie Sosinsky - Cloud Computing Bible, , Wiley- India, 2010 3. RajkumarBuyya, James Broberg, Andrzej M. Goscinski -Cloud Computing: Principles and Paradigms, Editors:, Wile, 2011 4. Nikos Antonopoulos, Lee Gillam,Cloud Computing: Principles, Systems and Applications, Springer, 2012		
References: 1. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley-India, 2010 2. GautamShroff, Enterprise Cloud Computing Technology Architecture Applications 3. Dimitris N. Chorafas, Cloud Computing Strategies [ISBN: 1439834539] 4. Barrie Sosinsky, — Cloud Computing Bible John Wiley & Sons, 2010 5. Tim Mather, SubraKumaraswamy, and ShahedLatif, Cloud Security and Privacy An Enterprise Perspective on Risks and Compliance, O'Reilly 2009		
DE528T206: E-COMMERCE		
Course Requisite: The term Cloud Computing refers to a big area of Information Technology that involves: hardware infrastructures, software infrastructures, data center facilities, virtualization technologies, and software engineering concepts.		
Course Objective: 1. Understand the new technologies for resources sharing 2. Explain classification of Cloud deployment 3. Discuss capacity planning for cloud configuration 4. Understand Cloud service model		
Course Outcome: After completion of the course students must be able to 1. State the basics of distributed computing and cloud computing. 2. Summarize the technical capabilities and business benefits cloud technology. 3. Develop cloud-based application demonstrating its implications 4. Able to understand about Market Analysis. 5. Understand about Digital Video and Electronic Commerce, Desktop Video Processing.		
	E-COMMERCE	L
Unit-1:	Introduction to Electronic Commerce – E-Commerce Framework- Anatomy of E-Commerce. Applications – E-Commerce Consumer & Organization Applications- E-Commerce and World Wide Web – Internet Service Providers – Architectural Framework for Electronic Commerce – WWW as the Architecture- Hypertext publishing.	9
Unit-2:	Electronic Payment Systems – Types of Electronic Payment Systems – Digital Token Based Electronic Payment System – Smart Cards – Credit Cards – Risk in Electronic Payment Systems – Designing Electronic Payment Systems	9
Unit-3:	Electronic Data Interchange, EDI Applications in Business, EDI implementation, MIME, and value added networksWork flow automation and Coordination, Customization and Internal Commerce, Supply Chain Management(SCM).	9

Unit-4 :	Corporate Digital Library – Document Library, Digital Document Types, Corporate Data Warehouse, Advertising and Marketing – Information based Marketing, Advertising on Internet, On-Line Marketing Process, Market Research.	9
Unit-5:	Consumer Search and Resource Discovery – Information Search and Retrieval, Commerce Catalogues, Information Filtering Multimedia – Key Multimedia Concepts, Digital Video and Electronic Commerce, Desktop Video Processing.	9
Text Books: 1. Ravi Kalakota& A. B. Whinston - "Frontiers of Electronic Commerce", Pearson Education, India, 1999. 2. Daniel Minoli, Emma Minoli: "Web Commerce Technology Handbook", Tata McGraw Hill 3. Bajaj and Nag, "E-Commerce the cutting edge of Business". TMH. 4. E-Business & Commerce: BrahmCazner, Wiley dreamtech.		
References: 1. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley-India, 2010		
UC528T205: ENVIRONMENTAL STUDIES		
Course Requisite:NIL		
Course Objective: 1. Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions. 2. Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving. 3. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems. 4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.		
Course Outcome: After completion of the course students must be able to 1. Get the knowledge about the nature. 2. Study the importance of nature & its responsibilities. 3. Study Population growth, variation among nations		
	ENVIRONMENTAL STUDIES	L
Unit-1:	The Multidisciplinary nature of environmental studies. Definition, scope and importance. . Need for public awareness. Social Issues and the Environment. From Unsustainable to Sustainable development . Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies.	10
Unit-2:	Environmentaethics : Issues and possible solutions. . Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. . Wasteland reclamation. . Consumerism and waste products. . Environment Protection Act. . Air (Prevention and Control of Pollution) Act. . Water (Prevention and Control of Pollution) Act. . Wildlife Protection Act. . Forest Conservation Act. . Issues involved in enforcement of environmental lesislation. Public awareness.	10



Unit-3:	Human Population and the Environment. Population growth, variation among nations. . Population explosion - Family Welfare Programme. Environment and human health. . Human Rights. Value Education. HIV / AIDS. Women and Child Welfare. . Role of Information Technology in Environment and human health. Case Studies.	10
Text Books: Source : Internet		

DC528P206: Operating System concepts using Android Lab

Minimum Eight experiments/ programming assignments based on Android must be completed based on the respective syllabus covering each of the units.

DC528P207: Database Management Systems Lab

Minimum Eight experiments/ programming assignments must be completed based on the respective syllabus covering each of the units.