

E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

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NAGAPATTINAM – 611002



B.TECH. INFORMATION TECHNOLOGY

R-2019

SEMESTER IV										
Course Code	Course Name	L	T	P	C	Maximum Marks			Category	
						CA	ES	Total		
Theory Course										
1902IT401	Database Management Systems	3	0	0	3	40	60	100	BS	
1902IT402	Java Programming	3	0	0	3	40	60	100	PC	
1902IT403	Operating Systems	3	0	0	3	40	60	100	PC	
1902IT404	Software Engineering and Project Management	3	0	0	3	40	60	100	PC	
1902IT405	Computer Networks	3	2	0	4	40	60	100	PC	
1902IT406	Principles of Communication	3	0	0	3	40	60	100	PC	
Laboratory Course										
1902IT451	Database Management Systems Lab	0	0	2	1	50	50	100	PC	
1902IT452	Java Programming Lab	0	0	2	1	50	50	100	PC	
1902IT453	Operating Systems Lab	0	0	2	1	50	50	100	PC	
1904GE451	Life Skills: Verbal Ability	0	0	2	1	100	-	100	EEC	
Audit Course										
1901MCX01	Environmental Science	2	0	0	0	100	-	100	-	
Total		20	2	8	23	590	510	1100	-	

1902IT401	DATABASE MANAGEMENT SYSTEMS			L	T	P	C
				3	0	0	3
AIM: To introduce the concepts of database management systems and the design of relational databases.							
PREREQUISITE: Programming and Problem Solving, Data Structures and Algorithms							
COURSE OBJECTIVES:							
	1. To understand the fundamentals of data models and conceptualize and depict a database system using ER diagram 2. To make a study of SQL and relational database design 3. To know about data storage techniques a query processing. 4. To impart knowledge in transaction processing, concurrency control techniques and recovery procedures. 5. To familiarize the students with the different types of databases.						
UNIT I	INTRODUCTION						9 Hours
Introduction to database - Data Base Architecture - Data Independence - Functional Dependencies — Relational Algebra-Entity relationship model - mapping cardinalities-keys, E-R diagrams.							
UNIT II	QUERY LANGUAGE & OPTIMIZATION						9 Hours
Relational Calculus – Tuple Relational Calculus – Domain Relational Calculus - SQL — DDL- DML- DCL-TCL-Embedded SQL-Static Vs Dynamic SQL - Views – Constraints – Query processing and optimization- - Normal Forms – 1NF to 5NF-Domain Key Normal Form							
UNIT III	TRANSACTION PROCESSING						9 Hours
Transaction Processing – Properties of Transactions –Serializability - Concurrency Control-Locking Mechanisms – Time Stamp ordering –Two phase Commit Protocol-Deadlock-Recovery systems-Log-based recovery.							
UNIT IV	FILES AND INDEXING						9 Hours
O3vreview of Physical Storage Media-RAID -File Organization-File operations – Hashing Techniques – Indexing -Single level and Multi-level Indexes-B+ tree Index Files-B tree Index Files.							
UNIT V	ADVANCED TOPICS						9 Hours
Data warehousing, heterogeneous component systems-Data mining and knowledge discovery-OODBMS- Object Relational Databases –XML Data Base - Cloud based systems – NOSQL introduction -Hbase data model -Database Tuning -Case Study for Design and Manage the Database for any Project.							
						TOTAL:	45 HOURS
FURTHER READING / SEMINAR :							
	1. Advanced Database Technology						
	2. Data mining and Data warehousing, Data Analytics						
COURSE OUTCOMES:							
After completion of the course, Student will be able to							
CO1	Classify the modern and futuristic database applications based on size and complexity						
CO2	Map ER model to Relational model to perform database design effectively						
CO3	Apply queries using normalization criteria and optimize the queries						
CO4	Compare and contrast various indexing strategies in different database systems						
CO5	Appraise how advanced databases differ from traditional databases						
CO6	Design XML schema, able to write XML queries for information retrieval						
REFERENCES:							
1.Abraham Silberschatz, Henry F.Korth and S.Sundarshan “Database System Concepts”, Sixth Edition, McGraw Hill, 2017.							
2. Ramez Elmasri and Shamkant B. Navathe, “Fundamentals of Database Systems”, Fifth Edition, Pearson Education, 2013.							
3.Thomas M. Connolly and Carolyn E. Begg, —Database Systems - A Practical Approach to Design, Implementation, and Managementl, fifth edition, Pearson Education, 2011							
4.C.J.Date, A.Kannan and S.Swamynathan, —An Introduction to Database Systemsl, Eighth Edition, Pearson Education, 2012.							
5.Raghu Ramakrishnan, —Database Management Systemsl, Fourth Edition, McGraw-Hill College Publications, 2015.							
6.Frank. P. Coyle, “XML, Web Services And The Data Revolution”, Pearson Education, 2012							
7. http://nptel.ac/in/							
8. http://coursera.org/							

1902IT402	JAVA PROGRAMMING	L	T	P	C
		3	0	0	3
AIM: The main objective of this course is used to develop object oriented programming, event driven, programming paradigm concept using Java					
PREREQUISITE	Programming and Problem Solving, Data Structures and Algorithms				
COURSE OBJECTIVES:	1. Enable learners to write Java programming using Object Oriented Programming Concepts 2. Develop Java programming using Event Driven and Strings 3. Familiar with Swings concepts using Java 4. Learn to think Java program using real time concepts and paradigms				
UNIT I	CLASSES AND OBJECTS	9 Hours			
Object oriented Programming – Objects - Classes – Encapsulation – Methods – Constructor – Java Documents					
UNIT II	ARRAYS, STRINGS, INHERITANCE	9 Hours			
I/O operations - Arrays – Strings – Inheritance – Interface- Polymorphism					
UNIT III	EVENT DRIVEN PROGRAMMING	9 Hours			
Packages - Events Handlers - Applets – Swings					
UNIT IV	CONNECTIVITY	9 Hours			
ODBC-JDBC – Threading – Exception Handling					
UNIT-V	APPLICATION PROGRAMMING	9 Hours			
Scripting – JSP- Servlet – Session Management – Full Stack Development					
TOTAL:					45 Hours
FURTHER READING / SEMINAR					
J2EE, J2ME, Mobile Application Development, Software Development					
COURSE OUTCOMES					
At the end of this course, students will able to, CO1: Understand the basic concepts of Java Programming CO2: Develop Java program using classes, objects, and encapsulation CO3: Design Inheritance and Interface using Java CO4: Implement Event Handler, JDBC and Exception Handling concepts using Java CO5: Create real time application using Java					
REFERENCES:					
1. Herbert Schidt, “The Complete Reference of Java”, Ninth Edition, Oracle Press, 2017 2. Cay S. Horstmann and Gary Cornell, “Core Java: Volume I – Fundamentals”, Eighth Edition, Sun Microsystems Press, 2012. 3. K. Arnold and J. Gosling, “The JAVA programming language”, Pearson Education, 2016. 4. Timothy Budd, “Understanding Object-oriented programming with Java”, Updated Edition, Pearson Education, 2012. 5. C. Thomas Wu, “An introduction to Object-oriented programming with Java”, Fourth Edition, Tata McGraw-Hill Publishing company Ltd., 2015.					
6. https://illearning.oracle.com/					
7. http://nptel.ac.in/					

1902IT403	OPERATING SYSTEMS			L	T	P	C
				3	0	0	3
AIM: To provide an understanding of the functions and modules of an operating system and study the concepts underlying its design and implementation.							
PREREQUISITE		Programming and Problem Solving, Data Structures and Algorithms, Computer Organization and Architecture					
COURSE OBJECTIVES:		<ol style="list-style-type: none"> 1. Study the basic concepts and functions of operating systems. 2. Learn about Processes, Threads and Scheduling algorithms. 3. Understand the principles of concurrency and Deadlocks. 4. Learn various memory management schemes. 5. Learn the basics of Linux system and perform administrative tasks on Linux Servers. 					
UNIT I	INTRODUCTION AND PROCESS MANAGEMENT						9 Hours
Operating system functions and characteristics - historical evolution of operating systems - Different types of Operating Systems - Issues in operating system design. Process abstraction - process address space - process management - system calls, threads - process hierarchy.							
UNIT II	CPU SCHEDULING AND DEADLOCK						9 Hours
Levels of scheduling, comparative study of scheduling algorithms – Dead Lock: Characterization, Prevention Detection , Avoidance and Recovery.							
UNIT III	CONCURRENT PROCESSES AND MEMORY MANAGEMENT						9 Hours
Critical section problem: Semaphores, monitors, Inter-process communication, message passing - Storage allocation methods, virtual memory concept, demand paging, page replacement algorithms, segmentation, thrashing.							
UNIT IV	FILE SYSTEMS AND DEVICE MANAGEMENT						9 Hours
Functions, file access and allocation methods, directory system, file protection mechanisms, implementation issues, file system hierarchy. Hardware organization, device scheduling policies, device drivers.							
UNIT V	CASE STUDY						9 Hours
Linux System- Basic Concepts; System Administration-Requirements for Linux System Administrator, Setting up a LINUX Multifunction Server, Domain Name System, Setting Up Local Network Services; Virtualization- Basic Concepts, Setting Up Xen,VMware on Linux Host and Adding Guest OS							
						TOTAL:	45 Hours
FURTHER READING / SEMINAR							
Android, iOS							
COURSE OUTCOMES							
At the end of this course, students will be able to, CO1: Understand the key concepts of operating system, process and process management CO2: Implement different CPU scheduling algorithms and investigate their merits CO3: Explain various deadlock scenarios and apply appropriate prevention techniques CO4: Implement techniques for synchronization of concurrent processes and memory management approach CO5: Identify and solve problems related to file system and device management system CO6: Perform administrative tasks on LINUX servers							
REFERENCES:							
1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, Operating System Concepts, John Wiley & Sons (Asia) Pvt. Ltd, Ninth Edition, 2017							
2. Gary Nutt, —Operating Systems- A Modern Perspective, Pearson Education Pvt. Ltd, Second Edition, 2013.							
3. Andrew S. Tanenbaum, —Modern Operating Systems, 3rd edition Prentice Hall of India Pvt. Ltd, 2015.							
4. Harvey M. Deitel, Operating Systems, Pearson Education Pvt. Ltd, Third Edition, 2013.							
5. William Stallings, Operating System, Pearson Education, Sixth edition, 2015.							
6. http://nptel.ac.in/							

1902IT404	SOFTWARE ENGINEERING AND PROJECT MANAGEMENT			L	T	P	C
				3	0	0	3
AIM: The main objective of this course is used to introduce the concepts of software development, design and implementation.							
PREREQUISITE		Programming and Problem Solving, Engineering Exploration					
COURSE OBJECTIVES:		<ol style="list-style-type: none"> 1. Understand the phases in a software project 2. Understand fundamental concepts of requirements engineering and Analysis Modeling. 3. Learn various testing and maintenance measures 4. To learn Aspect Oriented Programming Concepts 5. To outline the need for Software Project Management and to highlight different techniques for software cost estimation and change management 					
UNIT I	SOFTWARE PROCESS AND SPECIFICATIONS						9 Hours
Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models, Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management							
UNIT II	SOFTWARE DESIGN						9 Hours
Overview of System Design -System Design Concepts – System Design Activities – Addressing Design Goals – Managing System Design-Architectural Design -User Interface Design-Component level							
UNIT III	SOFTWARE IMPLEMENTATION AND TESTING						9 Hours
Software Implementation Techniques: Coding practices-Refactoring- Software testing fundamentals & Techniques: White box testing- Black box testing-Case study- Levels of testing : Unit Testing ,Integration Testing – System Testing and Debugging-Regression Testing- Acceptance testing-reverse engineering and re-engineering.							
UNIT IV	ASPECT ORIENTED SOFTWARE DEVELOPMENT						9 Hours
AO Design Principles -Separations of Concerns, Subject Oriented Decomposition, Traits, Aspect Oriented Decomposition, Theme Approach, Designing Base and Crosscutting Themes, Aspect-Oriented Programming using Aspect-J							
UNIT V	SOFTWARE PROJECT MANAGEMENT AND CONTROL						9 Hours
Estimation – FP Based, LOC Based, Make/Buy Decision, COCOMO Models - Project Plan, Planning Process, RFP Risk Management – Identification, Projection, RMMM - Scheduling and Tracking –Process and Project Metrics- Document Preparation and Production- Cost monitoring – Earned Value Analysis – Change control- Software Configuration Management – Managing contracts – Contract Management-Managing people							
						TOTAL:	45 Hours
FURTHER READING / SEMINAR							
Software Development, Software Testing, Software Quality Assurance, Software Configuration Management							
COURSE OUTCOMES							
At the end of this course, students will able to, CO1: Compare different Process models CO2: Understand different types of requirements and requirement Engineering process CO3: Understand the systematic procedure for software design and deployment CO4: Compare and contrast the various testing and maintenance CO5: Understand the concept of change management during development. CO6: Explain the basic concepts of AOP							
REFERENCES:							
1. Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, Seventh Edition, Mc Graw-Hill International Edition, 2017.							
2. Bernd Bruegge, Alan H Dutoit, Object-Oriented Software Engineering, 2nd ed, Pearson Education, 2014							
3. Craig Larman, Applying UML and Patterns, 3rd ed, Pearson Education, 2015.							
4. Stephen Schach, Software Engineering 7th ed, McGraw-Hill, 2015.							
5. AspectJ in Action, RamnivasLaddad, Manning Publications, 2013							
6. Aspect-Oriented Software Development, Robert E. Filman, TzillaElrad, Siobhan Clarke, and Mehmet Aksit, October 2014.							
7. http://nptel.ac.in/ .							

1902IT405	COMPUTER NETWORKS			L	T	P	C
				3	2	0	4
AIM: The main objective of this course is to understand the concept of computer network, various routing protocols, routing procedures for communications							
PREREQUISITE		Programming and Problem Solving, Digital principles and System Design, Data Structures and Algorithms					
COURSE OBJECTIVES:		<ol style="list-style-type: none"> 1. Identify the components required to build different types of networks 2. To learn about the division of network functionalities into layers. 3. Identify solution for each functionality at each layer 4. Choose the required functionality at each layer for given application 					
UNIT I	PHYSICAL AND DATA LINK LAYER						12 Hours
Computer Network – OSI Model – Communication Systems – Protocol and Standards – Wired vs Wireless – Data link layer – Error and Flow Control – Hamming Code – MAC - Case study: CSMA/CD & CA, Token Bus, Token Ring, Hub, Bridges							
UNIT II	NETWORK AND TRANSPORT LAYER						12 Hours
Internetworking – Virtual and Datagram - IP Address: IPv4, IPv6 – Routing: Link state, Distance vector – UDP – TCP – Case study: Switch, Router							
UNIT III	ROUTING SERVICES						12 Hours
Inter domain Routing – RIP – OSPF – BGP – ICMP – ARP – DHCP – Multicast routing							
UNIT IV	APPLICATION LAYER						12 Hours
Link Layer Services – Framing – FTP – Web Services - Email – HTTP – DNS							
UNIT V	CASE STUDY						12 Hours
IEEE Standards - Blue tooth – Wi-Fi – Network Management – SNMP – SNA – QoS – Congestion Control – Gateway							
TUTORIALS						12 Hours	
<ol style="list-style-type: none"> 1. Write a network application program 2. Use tools to visualize packet flow 3. Configure Router/Switch to set up network (network administration) 4. Simple Chat Program using TCP Sockets 5. Simulation of HTTP Protocol using TCP Sockets 6. Simulation of Sliding Window Protocol using TCP Sockets 7. Simulation of DNS using UDP Sockets 8. Simulation of Ping using Raw Sockets 9. Learn to use commands like TCP Dump, Netstat, Trace Route 10. Simulate networks using network simulators like NS-2 11. Performance comparison of MAC protocols using simulation tool 12. Performance comparison of Routing protocols using simulation tool 							
TOTAL:						60 Hours	
FURTHER READING: Distributed System, Security in Computing, Cloud Computing							
COURSE OUTCOMES		<p>At the end of this course, students will able to,</p> <p>CO1: Illustrate the concepts of physical and data link layers</p> <p>CO2: Explain the operations of network and transport layers</p> <p>CO3: Understand various routing services</p> <p>CO4: Design and implement a networking application incorporating the different layering protocols</p> <p>CO5: Simulate various application layers and real time network manage protocols</p>					
REFERENCES:		<ol style="list-style-type: none"> 1. Larry L. Peterson, Bruce S. Davie, Computer Networks: A systems approach, Fifth Edition, Morgan Kaufmann Publishers, 2016. 2. Forouzan, Behrouz A., and Firouz Mosharraf. Computer networks: a top-down approach, McGraw-Hill, Special Indian Edition 2016. 3. James F. Kurose, Keith W. Ross, —Computer Networking - A Top-Down Approach Featuring the Internet, Sixth Edition, Pearson Education, 2013. 4. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, —Computer Networks: An Open Source Approach, McGraw Hill Publisher, 2012. 5. Nader. F. Mir, —Computer and Communication Networks, Pearson Prentice Hall Publishers, 2015 6. http://nptel.ac.in/ 					

1902IT406	PRINCIPLES OF COMMUNICATION			L	T	P	C
				3	0	0	3
AIM: This course is study the concepts of various communication techniques							
COURSE OBJECTIVES:							
	This course is a graduate level introduction to the basic principles of digital communication systems. A digital communication system is one that transmits a source (voice, video, data, etc.) from one point to another, by first converting it into a stream of bits, and then into symbols that can be transmitted over channels (cable, wireless, storage, etc.). The use of the digital bit-stream as the interface between the source and the channel is universal regardless of what kind of source and channel are involved.						
UNIT I	FUNDAMENTALS OF ANALOG COMMUNICATION						9 Hours
Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves							
UNIT II	DIGITAL COMMUNICATION						9 Hours
Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK.							
UNIT III	DIGITAL TRANSMISSION						9 Hours
Introduction, Pulse modulation, PCM sampling, sampling rate, signal to quantization noise rate, companding analog and digital percentage error, delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission – Intersymbol interference, eye patterns.							
UNIT IV	SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES						9 Hours
Introduction, Pseudonoise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications							
UNIT V	SATELLITE AND OPTICAL COMMUNICATION						9 Hours
Satellite Communication Systems- Keplers Law, LEO and GEO Orbits, footprint, Link model Optical Communication Systems- Elements of Optical Fiber Transmission link, Types, Losses, Sources and Detectors.							
						TOTAL:	45 HOURS
FURTHER READING / SEMINAR :							
	1. Mobile Communications						
	2. Wireless Communications						
COURSE OUTCOMES:							
	After completion of the course, Student will be able to						
CO1	Understand the concepts of analog communication techniques						
CO2	Understand the concepts of digital communication techniques						
CO3	Explain various digital communication techniques with keying principles						
CO4	Analyze the performance Spread Spectrum and multiple access techniques						
CO5	Explain satellite and optical communication						
REFERENCES:							
1. Wayne Tomasi, “Advanced Electronic Communication Systems”, Pearson Education, 2016.							
2. Simon Haykin, “Communication Systems”, 7th Edition, John Wiley & Sons., 2012.							
3. H.Taub, D L Schilling, G Saha, ”Principles of Communication” 3/e, 2011.							
4. B.P.Lathi, ”Modern Analog And Digital Communication systems”, 3/e, Oxford University Press, 2012							
5. Blake, “Electronic Communication Systems”, Thomson Delmar Publications, 2012.							
6. Martin S.Roden, “Analog and Digital Communication System”, 5th Edition, PHI, 2012.							
7. http://nptel.ac.in							
9. http://coursera.org							

1902IT451		DATABASE MANAGEMENT SYSTEMS LAB	L	T	P	C
			0	0	2	1
LIST OF EXPERIMENTS:						
1	DDL and DML commands					
2	Transaction control commands and aggregate functions					
3	Joins and Nested Queries					
4	Constraints and Views					
5	High level programming language extensions (Control structures, Procedures and Functions).					
6	Cursors and Triggers					
7	Embedded SQL					
8	Procedures, Functions and Report					
9	Database Design and implementation with any one front end tool (Mini Project) Sample list of Projects 1. Hospital management 2. Railway ticket reservation 3. Student Mark list processing 4. Employee pay roll processing 5. Inventory control					
					TOTAL:	30 HOURS
REQUIREMENTS:						
Hardware: Standalone desktops 30 Nos. (or) Server supporting 30 terminals or more.						
Software: Front end: Visual Studio or Java or Equivalent Back end: Oracle / MySQL/ Sql Server DB2 or Equivalent.						
FURTHER READING / SEMINAR :						
	Under MoU with Oracle Academy, a programme Oracle Workforce Development Programme (OWDP) is conducted. In this programme extensive hands-on training on SQL and PL/SQL will be given to students during the Lab sessions. <ul style="list-style-type: none"> • Writing SQL queries for Hierarchical retrieval of data (tree structured data) • Querying Data Dictionary static Views • Using stored procedures and Functions for implementing object level data security 					

1902IT452	JAVA PROGRAMMING LAB	L	T	P	C
		0	0	2	1
LIST OF EXPERIMENTS:					
MODULE – 1		10 Hours			
1. Study of key features of the Java language, intro to the Java Development Kit (JDK) and Java Virtual Machine 2. Play with Data types, keywords, encapsulation, conditional and control statements, looping, branching 3. Implement Java programming concepts using Classes and Objects 4. Implement Java programming concepts using Arrays, Inheritance and Interfaces 5. Perform event handlers program using Java					
MODULE – 2		20 Hours			
1. Design a class for Complex numbers in Java. In addition to methods for basic operations on complex numbers, provide a method to return the number of active objects created. 2. Develop a simple paint-like program that can draw basic graphical primitives in different dimensions and colors. Use appropriate menu and buttons. 3. Develop a scientific calculator using even-driven programming paradigm of Java. 4. Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and Fibonacci number 5. Develop Mini-Project for Library Automation System using Events, JDBC and Exception Handling					
Requirement for a batch of 30 students Software: Operating System: Windows /Linux operating system Tool: JDK 1.6 (or above) IDE: Net beans or Eclipse					
TOTAL:					30 Hours

1902IT453	OPERATING SYSTEMS LAB			L	T	P	C
				0	0	2	1
PREREQUISITE		Programming in C & C++, Database Management Systems, Computer Architecture					
LIST OF PROGRAMS							
<ol style="list-style-type: none"> 1. Installing of operating system and resource allocation 2. Shell Programming : Creating a script, making a script executable, shell syntax (variables, conditions, control structures, functions, commands). 3. Simulate the following CPU scheduling algorithms 4. Simulate Bankers Algorithm for Dead Lock Avoidance 5. Simulate Bankers Algorithm for Dead Lock Prevention 6. Simulate all file allocation strategies 7. Process synchronization using semaphores 8. Simulate all File Organization Techniques 9. Simulate all page replacement algorithms 10. Study of Linux OS, Microsoft, Mobile OS 							
Requirement for a batch of 30 students							
Software:							
Operating System: Windows /Linux operating system							
Tool: JDK 1.6 (or above)							
IDE: Net beans or Eclipse							
						TOTAL:	30 Hours

1904GE451	LIFE SKILLS : VERBAL ABILITY			L	T	P	C
				0	0	2	1
COURSE OBJECTIVES:							
<ol style="list-style-type: none"> To help students comprehend and use vocabulary To apply appropriate reading strategies for interpreting technical and non-technical documents used in job-related settings. To ensure students will be able to use targeted grammatical structures meaningfully and appropriately in oral and written production. To enable the students to arrange the sentences in meaningful unit and to determine whether constructions rely on active or passive voice To Apply the principles of effective business writing to hone communication skills 							
MODULE I	VOCABULARY USAGE						6 hours
Introduction - Synonyms and Antonyms based on Technical terms – Single word Substitution – Newspaper, Audio and video listening activity.							
MODULE II	COMPREHENSION ABILITY						
Skimming and Scanning – Social Science passages – Business and Economics passages – latest political and current event based passages – Theme detection – Deriving conclusion from passages							
MODULE III	BASIC GRAMMAR AND ERROR DETECTION						6 hours
Parallelism – Redundancy – Ambiguity – Concord - Common Errors – Spotting Errors – Sentence improvement – Error Detection FAQ in Competitive exams.							
MODULE IV	REARRANGEMENT AND GENERAL USAGE						6 hours
Jumble Sentences – Cloze Test - Idioms and Phrases – Active and passive voice – Spelling test.							
MODULE V	APPLICATION OF VERBAL ABILITY						6 hours
Business Writing - Business Vocabulary - Delivering Good / Bad News - Media Communication - Email Etiquette – Report Writing - Proposal writing – Essay writing– Indexing –Market surveying.							
							TOTAL: 30 HOURS
COURSE OUTCOMES							
CO1	Construct new words in their day to day communication.						
CO2	Predict the information swiftly while reading passages.						
CO3	Elaborate their oral and written communication.						
CO4	Rephrase the sentences and able to identify the voice of the sentence.						
CO5	Summarize their knowledge of the best practices to craft effective business documents						
CO6	Make use of the etiquette in business.						
REFERENCES:							
1. Arun Sharma and Meenakshi Upadhyav, How to Prepare for Verbal Ability and Reading Comprehension for CAT, McGrawHill Publication, Seventh Edition 2017							
2. R S Aggarwal and Vikas Aggarwal , Quick Learning Objective General English ,S.Chand Publishing House, 2017							
3. Dr.K.Alex , Soft Skills, S.Chand Publishing House, Third Revise Edition, 2014							
4. Raymond Murphy, Essential English Grammar in Use, Cambridge University press, New Delhi, Third Edition , 2007							

1901MCX01		ENVIRONMENTAL SCIENCE	L	T	P	C
			2	0	0	0
COURSE OBJECTIVES:						
	<ol style="list-style-type: none"> 1. Realize the interdisciplinary and holistic nature of the environment. 2. Understand how natural resources and environment affect the quality of life and stimulate the quest for sustainable development. 3. Recognize the socio-economic, political and ethical issues in environmental science. 					
<p>Module 1: ECOSYSTEMS AND BIODIVERSITY - Concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – Oxygen cycle and Nitrogen cycle – energy flow in the ecosystem – ecological succession processes – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – hot – spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man – wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Documentation of the medicinal plants in your native place</p> <p>Module 2: ENVIRONMENTAL POLLUTION -Definition – Source, causes, effects and control measures of: (a) Air pollution – Mitigation procedures – Control of particulate and gaseous emission, Control of SO_x, NO_x, CO and HC) – E-Waste - Technology for capturing CO₂ (metallo- organic frame works) (b) Water pollution – Waste water treatment processes. (c) Soil pollution – soil waste management: causes, effects and control measures of municipal solid wastes – (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – role of an individual in prevention of pollution – pollution case studies. Documentation study of local polluted site – Urban / Rural / Industrial / Agricultural.</p> <p>Module 3: SOCIAL ISSUES AND THE ENVIRONMENT - From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – environmental ethics: Issues and possible solutions – 12 Principles of green chemistry – consumerism and waste products – environment protection act – Air act – Water act – Wildlife protection act – Forest conservation act – The Biomedical Waste (Management and Handling) Rules; 1998 and amendments – scheme of labeling of environmentally friendly products (Ecomark) central and state pollution control boards – disaster management: floods, earthquake – Public awareness. Analyze the recent steps taken by government of India to prevent pollution (Green India and Clean India).</p> <p>Module 4: 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 – Environmental impact analysis (EIA) – GIS – remote sensing – role of information technology in environment and human health</p>						
			TOTAL:	30 HOURS		
COURSE OUTCOMES:						
<p>After completion of the course, Student will be able to</p> <p>CO1: Describe the importance of ecosystem and its conservation.</p> <p>CO2: Differentiate various natural resources and the urgent need to conserve the natural resources.</p> <p>CO3: Explain the different types of pollution and its effects.</p> <p>CO4: Describe the various environmental protection acts.</p> <p>CO5: Explain the major diseases, women, child development and the impacts of population explosion.</p>						
REFERENCES:						
<ol style="list-style-type: none"> 1. Trivedi. R.K., “Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards”, Vol. I and II, Enviro Media, 3rd edition, BPB publications, 2010. 2. Cunningham, W.P.Cooper, T.H. Gorhani, “Environmental Encyclopedia”, Jaico Publishing House, Mumbai, 2001. 3. Dharmendra S. Sengar, “Environmental law”, Prentice hall of India PVT LTD, New Delhi, 2007. 4. Rajagopalan. R, “Environmental Studies-From Crisis to Cure”, Oxford University Press, 2005. 5. Benny Joseph, “Environmental Science and Engineering”, Tata McGraw-Hill, New Delhi, 2006. 6. Ravikrishnan. A., “Environmental Science and Engineering”, Sri Krishna Hi-tech Publishing Company Pvt. Ltd. 						