UNIVERSITY OF MUMBAI

Bachelor of Engineering

Information Technology (Third Year – Sem. V)

Revised course

(REV- 2012) from Academic Year 2014 -15

Under

FACULTY OF TECHNOLOGY

(As per Semester Based Credit and Grading System)

Third Year Engineering (Semester V)
Revised course for Information Technology
Academic Year 2014-15 (REV- 2012)

Sub Code	Subject Name	Teaching Scheme (hrs/week)			Credits Assigned			
		Theory	Practical	Tut.	Theory	TW/ Practical	Tut.	Total
TEITC501	Computer Graphics and Virtual Reality	4			4			4
TEITC502	Operating Systems	4			4			4
TEITC503	Microcontroller and Embedded Systems	4			4			4
TEITC504	Advanced Database Management Systems	4			4			4
TEITC505	Open Source Technologies	3			3			3
TEITC506	Business Communication and Ethics*		2**+2			2		2
TEITL501	Computer Graphics and Virtual Reality		2			1		1
TEITL502	Operating Systems		2			1		1
TEITL503	Microcontroller and Embedded Systems		2			1		1
TEITL504	Advanced Database Management Systems		2			1		1
TEITL505	Open Source Technologies		2			1		1
	Total	19	12		19	07		26

***Common for all programs.**
****Theory class to be conducted for entire class.**

Note: During third year of engineering learners can be exposed to industrial environment by arranging an industrial visit.

Examination Scheme

Course Code	Course Name	Theory					Term work	Pract/ Oral	Total
		Internal Assessment			End sem exam	Exam duration (in Hrs)			
		TEST 1	TEST 2	AVG.					
TEITC501	Computer Graphics and Virtual Reality	20	20	20	80	3	25	25	150
TEITC502	Operating Systems	20	20	20	80	3	25	25	150
TEITC503	Microcontroller and Embedded Systems	20	20	20	80	3	25	25	150
TEITC504	Advanced Database Management Systems	20	20	20	80	3	25	25	150
TEITC505	Open Source Technologies	20	20	20	80	3	25	25	150
TEITC506	Business Communication and Ethics*	---	---	---	---	---	25	25	050
	Total	100	100	100	400	15	150	150	800

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/ Practical	Tutorial	Total
TEITC501	Computer Graphics And Virtual Reality	04 Hrs./Week	02 Hrs./Week	---	04	01	---	05

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
TEITC501	Computer Graphics And Virtual Reality	20	20	20	80	25	25	---	150

Course Objectives	
1	The objective of the course is to equip students with the fundamental knowledge and basic technical competence in the field of computer graphics.
2	Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes so as to fit them as per the picture definition.
3	Provide an understanding of mapping from a world coordinates to device coordinates, clipping, solid modeling, rendering, and projections.
4	To comprehend and analyze the fundamentals of animation, virtual reality, underlying technologies, principles, and applications.

Course Outcomes	
1	Students shall have understood basic concepts of computer graphics.
2	Students shall have understood algorithms to scan convert the basic geometrical primitives, transformations, Area filling, clipping.
3	Students shall have understood the fundamentals of animation, Virtual reality ,the related technologies, and shall be able to describe applications of Virtual Reality.

DETAILED SYLLABUS

Sr. No.	Module	Detailed Content	Hours
1.	**Introduction to Computer graphics and Output primitives**	Introduction, Display Devices, Bitmap and Vector based graphics, Overview of Coordinate system, Scan Conversion of**:**point, line using Digital differential analyzer& Bresenham's algorithm, circle using midpoint approach, Curve Generation **:** Bezier and B-Spline curves. Introduction to fractals: generation procedure, classification, dimension and Koch Curve.	**10**
2.	**Area Filling and Two Dimensional Transformations**	Area filling **:** Inside/Outside Test , Scan line Polygon Fill Algorithm , Boundary Fill and Flood Fill algorithm. Basic Geometrical 2D transformations : Translation, Rotation, Scaling, Reflection, Shear, their homogeneous Matrix representation and Composite transformation.	**8**
3.	**Two Dimensional Viewing**	Introduction ,Viewing Pipeline , View Coordinate reference frame ,Window to viewport transformation, Point clipping, Line clipping**:** Cohen Sutherland Algorithm, Liang Barsky algorithms, Polygon clipping**:** Sutherland Hodgeman polygon clipping and Weiler Atherton. Text Clipping.	**6**
4.	**Three Dimensional Transformation,Viewing and Projection.**	Three Dimensional transformations**:** Translation, Scaling, Rotations, Composite. Three Dimensional object representation: Polygon Surfaces, Tables, Meshes. Three Dimensional Viewing Pipeline , Viewing transformation , Projections **:** Parallel(Oblique and orthographic), Perspective (one Point)	**6**
5.	**Introduction to Animation**	Key Frame Animation, Animation Sequence, Motion Control Methods, Morphing, Warping(only Mesh Warping).	**2**
6.	**Introduction to Virtual Reality**	Virtual Reality : Basic Concepts , Classical Components of VR System , Types of VR Systems, Three Dimensional Position Trackers, Navigation and Manipulation Interfaces, Gesture	**8**

		Interfaces, Graphical Display, Sound displays, and Haptic Feedback . Input Devices ,Graphical Rendering Pipeline , Haptic Rendering Pipeline, Open GL rendering pipeline.Applications of Virtual Reality.	
7	**Modeling**	Geometric Modeling: Virtual Object Shape, Object Visual Appearance.Kinematics Modeling: Object Position, Transformation Invariants, Object Hierarchies, Physical Modeling: Collision Detection, Surface Deformation, Force Computation. Behavior Modeling.	**4**
8	**Introduction to VR programming**	Introduction , Programming through VRML : Defining and Using Nodes and Shapes , VRML Browsers , Java 3D :Visual Object Definition by Shape 3D instances , Defining personal visual object class, ColorCube Class, Geometric – Utility Classes, Geometry Classes , Attributes.	**4**

Text Books

1 Donald Hearn and M. Pauline Baker, "Computer Graphics", Pearson Education.

2 R. K Maurya, "Computer Graphics with Virtual Reality", Wiley India.

Reference Books

1 Grigore Burdea, Philippe Coiffet, "Virtual Reality Technology", Wiley.

2 Steven Harrington, "Computer Graphics", McGraw Hill.

3 Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill.

4 Vince, "Virtual Reality Systems", Pearson Education.

5 F.S. Hill , Stephen M. Kelley , "Computer Graphics using Open GL" Prentice Hall

Term work: Term Work shall consist of programs based on the given list. Journal must include at least 2 assignments.

Term Work Marks: 25 Marks (Total marks) = 15 Marks (Experiment) + 5 Marks (Assignments) + 5 Marks (Attendance)

Suggested Practical List:

1. Implementation of Line Drawing algorithms : DDA , Bresenham and using them generating line with different styles like dotted , dashed , centered and thick line.
2. Implementation of Circle generation algorithm : Midpoint and using it generating concentric circles.
3. Implementation of Area Filling Algorithm : Boundary Fill , Flood Fill and Scan line Polygon Fill.
4. Curve Generation : Bezier for n control points , B Spline (Uniform)
5. Fractal Generation (Koch Curve)
6. Program for performing Two Dimensional Transformations : Translation , Scaling , Rotation , Reflection , Shear by using a homogeneous Matrix representation ,use of a function for matrix multiplication is desirable , so as to perform composite transformation.
7. Implementation of Line Clipping Algorithm : Cohen Sutherland , Liang Barsky.
8. Implementation of Polygon Clipping Algorithm : Sutherland Hodgman.
9. Program to represent a 3D object using polygon surfaces and then perform 3D transformation.
10. Program to perform projection of a 3D object on Projection Plane : Parallel and Perspective.
11. Program for Animation.

    It is desirable to implement some of the experiments by using Open GL.

    In addition at least 3 programs using VRML and JAVA 3D APIs.

    It is recommended to encourage the student to form a group for a mini project (a simple graphical utility) and for them submitting a theoretical Q. / A. type assignments can be kept optional.

Theory Examination:

- Question paper will comprise of 6 questions, each carrying 20 marks.
- Total 4 questions need to be solved.
- Q.1 will be compulsory, based on entire syllabus.
- Remaining question will be randomly selected from all the modules.
- Weightage of marks should be proportional to number of hours assigned to each module.

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/ Practical	Tutorial	Total
TEITC502	Operating Systems	04 Hrs./Week	02 Hrs./Week	---	04	01	---	05

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test2	Avg. of 2 Tests					
TEITC502	Operating Systems	20	20	20	80	25	---	25	150

Pre-requisites: Data structures, Programming Language (C / JAVA), Computer Organization & Architecture.

Course Objectives:

- To understand the main components of an OS & their functions.
- To understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.
- To understand the concepts and implementation of virtual memory.
- To understand various issues in Inter Process Communication (IPC) and the role of OS in IPC.
- To study different file systems of OS like Linux, Windows and overview of OS for mobile & hand held devices.

Course Outcomes:

- Student will learn important computer system resources and their management policies, algorithms used by operating systems.
- Student will understand what makes a computer system function and the primary PC components.
- Student will understand the working of an OS as a manager of various resources.
- Student will implement some of the functions of OS such as scheduling policies, page replacement algorithms, IPC.

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours
1	**Overview of Operating System**	Operating system objectives and functions, Evolution of OS, Characteristics of modern OS, Basic concepts: Processes, Files, System calls, Shell, Kernel architectures: Monolithic, Micro-kernel, Layered, Kernel mode of operations.	**4**
2	**Process Management**	Process description: Process, Process States, Process Control Block (PCB), Threads, Thread management. Process Scheduling: Types, Comparison of different scheduling policies.	**10**
3	**Process Co-ordination**	Principles of Concurrency, Race condition and critical section, Mutual Exclusion- Hardware and Software approaches, Semaphores, Monitors, Message Passing, Producer Consumer Problem. Deadlock: Principles of Deadlock, Deadlock Detection, Deadlock Avoidance, Deadlock Prevention**.**	**10**
4	**Memory Management**	Memory Management Requirements, Memory Partitioning, Virtual memory: Paging; Segmentation; Page replacement policies, page faults.	**6**
5	**Input Output Management**	I/O Devices, Organization of the I/O Function, Operating System Design Issues, I/O Buffering, Disk Scheduling and disk scheduling algorithms, Disk cache.	**6**
6	**File Management**	Overview, File Organization, File Sharing; Record Blocking; Secondary Storage Management.	**6**
7	**Case Studies**	Producer Consumer Problem, Multithreading, RAID, File systems of Windows and Linux , Overview of Android OS.	**6**

Text Books:

1. Modern Operating Systems, Tanenbaum, IIIrd Edition, PHI
2. Operating System-Internal & Design Principles, VIth Edition, William Stallings, Pearson
3. Operating Systems Concepts, Silberschatz A., Galvin P., Gagne G, VIIIth Edition Wiley.
4. Principles of Operating Systems, Naresh Chauhan, First Edition , Oxford university press.

References:

1. Operating Systems in Depth, Thomas W. Doeppner, Wiley.
2. Operating System Programming and Operating Systems, D M Dhamdhere, IInd Revised Edition, Tata McGraw.
3. Operating Systems, *Achyut S. Godbole,* 2nd edition, Tata McGraw Hill.
4. Application development using Android, Hello, Android, mobile development platform, Ed Burnette, 3rd Edition.
5. Linux Command Line & Shell Scripting, Richard Blum and Christine Bresnahan, 2nd edition, Wiley.

Term work: Term Work shall consist of programs based on the given list. Journal must include at least 2 assignments.

Term Work Marks: 25 Marks (Total marks) = 15 Marks (Experiment) + 5 Marks (Assignments) + 5 Marks (Attendance)
Oral Examination will be based on the above syllabus.
Suggested Practical List:

1. Implementation of System Calls (at least five).
2. Implementation of CPU Scheduling Policies (both pre-emptive and non pre-emptive).
3. Implementation of Page Replacement Algorithms.
4. Implementation of IPC (Producer Consumer problem) .
5. Implementation of Multithreading.
6. Implementation of Deadlock Avoidance algorithm (Bankers algorithm).

Theory Examination:

- Question paper will comprise of 6 questions, each carrying 20 marks.
- Total 4 questions need to be solved.
- Q.1 will be compulsory, based on entire syllabus.
- Remaining question will be randomly selected from all the modules.
- Weightage of marks should be proportional to number of hours assigned to each module.

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tut.	Theory	TW/ Practical	Tut.	Total
TEITC503	Microcontroller and Embedded Systems	04 Hrs./Week	02 Hrs./Week	---	04	01	---	05

Course Code	Course Name	Examination Scheme							
		Theory Marks				TW	Practical	Oral	Total
		Internal Assessment			End Semester Exam				
		Test1 (T1)	Test2 (T2)	Average of T1 & T2					
TEITC503	Microcontroller and Embedded Systems	20	20	20	80	25	-	25	150

Pre-requisites: Fundamentals of Computer, Digital Logic Circuits, Computer Organization and Architecture

Course Objectives:

CEO 1	To conceptualize the basics of embedded systems
CEO 2	To conceptualize the basics of organizational and architectural issues of a microcontroller.
CEO 3	To learn programming techniques used in microcontroller.
CEO 4	To understand basic concept of ARM processor
CEO 5	To understand fundamentals of real time operating system

Course Outcomes:

A	Ability to understand basic structure embedded systems
B	Ability to understand basic structure microcontroller.
C	Ability to understand basic concepts used in embedded system.
D	Ability to program microcontroller.
E	Ability to design conceptual embedded system.

Detailed Syllabus:

Module	Detailed Contents	Hours
1	**Introduction to Embedded Systems:** Overview of Embedded System Architecture, Application areas, Categories of embedded systems, specialties of embedded systems. Recent trends in embedded systems. Brief introduction to embedded microcontroller cores CISC, RISC, ARM, DSP and SoC.	**06**
2	**The Microcontroller Architecture:** Introduction to 8051 Microcontroller, Architecture, Pin configuration, Memory organization, Input /Output Ports, Counter and Timers, Serial communication, Interrupts.	**08**
3	**Assembly Language Programming of 8051:** Instruction set, Addressing modes, Development tools, Assembler Directives, Programming based on Arithmetic & Logical operations, I/O parallel and serial ports, Timers & Counters, and ISR.	**10**
4	**ARM 7 architecture:** Architectural inheritance, Detailed study of Programmer's model, ARM Development tools, Instruction set: Data processing, Data transfer, Control flow. Addressing modes. Writing simple assembly language programs. Pipelining, Brief introduction to exceptions and interrupts handling.	**10**
5	**Embedded / Real Time Operating System:** Architecture of kernel, Task and Task scheduler, Interrupt service routines, Semaphores, Mutex, Mailboxes, Message queues, Event registers, Pipes, Signals, Timers, Memory management, Priority inversion problem. Off-the-Shelf Operating Systems, Embedded Operating Systems, Real Time Operating System (RTOS) and Handheld Operating Systems.	**8**
6	**Embedded System - Design case studies:** Digital clock, Battery operated smart card reader, Automated meter reading system, Digital camera.	**06**

Text Books:

1. The 8051 microcontroller & Embedded systems, M. A. Mazidi, J. G. Mazidi, R. D. McKinlay, Pearson
2. The 8051 microcontroller & Embedded systems, Kenneth J. Ayala, Dhananjay V. Gadre, Cengage Learning
3. Embedded / real – time systems: concepts, design & programming, Black Book, Dr. K. V. K. K. Prasad, Dreamtech press, Reprint edition 2013
4. Introduction to embedded systems, Shibu K. V., McGraw Hill
5. ARM System on chip Architecture, Steve Furber, Pearson, edition second

Reference Books:

1. Embedded systems an integrated approach, Laya B. Das, Pearson, Third impression, 2013
2. ARM system developer's guide, Andrew N. Sloss, Dominic Symes, Chris Wright, Morgan Kaufmann Publishers
3. Embedded system design A Unified hardware/software Introduction, Frank Vahid, Tony Givargis, Wiely
4. ARM Technical Reference manual

Term Work: 25 Marks (Total marks) = 15 Marks (Experiment and Case Studies) + 5 Marks (Assignments) + 5 Marks (Attendance)

The faculty should conduct eight programming practicals/experiments based on the above syllabus and two case studies based on recent trends in embedded systems.

Oral examination will be based on the above syllabus.

Theory Examination:

- Question paper will comprise of 6 questions, each carrying 20 marks.
- Total 4 questions need to be solved.
- Q.1 will be compulsory, based on entire syllabus.
- Remaining question will be randomly selected from all the modules.
- Weightage of marks should be proportional to number of hours assigned to each module.

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
TEITC504	Advanced Database Management Systems	04 Hr/week	02 Hr/week	---	04	01	---	05

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test2	Avg. of 2 Tests					
TEITC504	Advanced Database Management Systems	20	20	20	80	25	---	25	150

Course Objectives:

1. To reinforce and strengthen the database concepts learned in the basic course in database technologies
2. To impart skills that can help design and implement advanced queries using Structured Query Language.
3. To equip students with knowledge to implement and integrate databases in actual applications.
4. To make students aware of how databases are actually stored and accessed.
5. To introduce advanced concepts of transaction management and recovery techniques.
6. To initiate awareness about the potential security threats that exist in database systems and how to tackle them

7. To introduce other database models like distributed and object based
8. To create awareness of how enterprise can organize and analyze large amounts of data by creating a Data Warehouse.

Course Outcomes: At the end of the course the student will be able to:

1. Construct complex queries using SQL to retrieve and manipulate information in a database.
2. Design and implement full-fledged real life applications integrated with database systems.
3. Clearly understand how databases are actually stored and accessed; How transaction ACID properties are maintained and how a database recovers from failures.
4. Apply security controls to avoid any type of security incidents on vital database systems.
5. Design advanced data systems using Object based systems or Distributing databases for better resource management.
6. Understand the importance of enterprise data and be able to organize data to perform analysis on the data and take strategic decisions.

DETAILED SYLLABUS

Sr. No.	Module	Detailed Content	Hours	Weightage
1	**Introduction**	Reviewing basic concepts of a relational database, Basic SQL	**01**	**0%**
2	**Advanced SQL**	Complex Retrieval Queries using Group By, Recursive Queries, nested Queries ; Specifying Constraints as Assertions; Event Condition Action (ECA) model (Triggers) in SQL; Creating and working with Views in SQL; Database Programming: Embedded SQL, Dynamic SQL and SQLJ, Database Programming with Function Calls: JDBC; Stored Procedures in SQL, Embedded SQL, Dynamic SQL.	**06**	**10%**

3	**Advanced Transaction Processing & Recovery**	Review of ACID properties and Serializability; Multiversion Concurrency Control Techniques; Granularity of Data Items and Multiple Granularity Locking ; Advanced Database Recovery techniques like Write Ahead Logging (WAL), ARIES, Checkpoints.	**06**	**10%**
4	**Data Security**	Introduction to Database Security Issues; Discretionary Access Control Based on Granting and Revoking Privileges; Mandatory Access Control and Role-Based Access Control for Multilevel Security; SQL Injection; Introduction to Statistical Database Security Introduction to Flow Control	**04**	**10%**
5	**Storage and Indexing**	Operation on Files; hashing Techniques; Types of Single-Level Ordered Indexes; Multilevel Indexes; Dynamic Multilevel Indexes Using B-Trees and B+-Trees; Indexes on Multiple Keys.	**04**	**10%**
6	**Distributed Databases**	Types of Distributed Database Systems; Distributed Database Architectures; Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design; Query Processing and Optimization in Distributed Databases; Overview of Transaction Management in Distributed Databases; Overview of Concurrency Control and Recovery in Distributed Databases.	**06**	**10%**
7	**Object Based Databases**	Overview of Object Database Concepts; Object-Relational Features; Object Database Extensions to SQL; The Object Definition Language ODL; Object Database Conceptual Design; The Object Query Language OQL.	**05**	**10%**
8	**Introduction to Data**	The Need for Data Warehousing; Increasing Demand for Strategic Information; Inability of Past Decision Support System; Operational Vs Decisional Support System; 1.3 Data	**02**	**5%**

	Warehousing	Warehouse Defined; Benefits of Data Warehousing ; Features of a Data Warehouse; The Information Flow Mechanism; Role of Metadata; Classification of Metadata; Data Warehouse Architecture; Different Types of Architecture; Data Warehouse and Data Marts; Data Warehousing Design Strategies.		
9	**Dimensional Modeling**	Data Warehouse Modeling Vs Operational Database Modeling; Dimensional Model Vs ER Model; Features of a Good Dimensional Model; The Star Schema; How Does a Query Execute? The Snowflake Schema; Fact Tables and Dimension Tables:; he Factless Fact Table; Updates To Dimension Tables: Slowly Changing Dimensions, Type 1 Changes, Type 2 Changes, Type 3 Changes, Large Dimension Tables, Rapidly Changing or Large Slowly Changing Dimensions, Junk Dimensions, Keys in the Data Warehouse Schema, Primary Keys, Surrogate Keys & Foreign Keys; Aggregate Tables; Fact Constellation Schema or Families of Star.	**06**	**15%**
10	**ETL Process**	Challenges in ETL Functions; Data Extraction; Identification of Data Sources; Extracting Data: Immediate Data Extraction, Deferred Data Extraction; Data Transformation: Tasks Involved in Data Transformation, Data Loading: Techniques of Data Loading, Loading the Fact Tables and Dimension Tables Data Quality; Issues in Data Cleansing.	**04**	**10%**
11	**Online Analytical Processing (OLAP)**	Need for Online Analytical Processing; OLTP vs OLAP; OLAP and Multidimensional Analysis; Hypercubes; OLAP Operations in Multidimensional Data Model; OLAP Models: MOLAP, ROLAP, HOLAP, DOLAP;	**04**	**10%**

Text Books:

1. Elmasri and Navathe, "Fundamentals of Database Systems", 6th Edition, PEARSON Education.
2. Korth, Slberchatz,Sudarshan, :"Database System Concepts", 6th Edition, McGraw – Hill
3. Theraja Reema, "Data Warehousing", Oxford University Press, 2009

References:

1. Paulraj Ponniah, "Data Warehousing: Fundamentals for IT Professionals", Wiley India.
2. C. J. Date, A. Kannan, S. Swamynathan "An Introduction To Database Systems", 8th Edition Pearson Education.
3. Raghu Ramakrishnan and Johannes Gehrke, "Database Management Systems" 3rd Edition - McGraw Hill
4. Ralph Kimball, Margy Ross, "The Data Warehouse Toolkit: The Definitive Guide To Dimensional Modeling", 3rd Edition. Wiley India.

Oral Exam:

An oral exam will be held based on the above syllabus.

Term work:

Assign a case study for group of 2/3 students and each group to perform the following experiments on their case-study:

Suggested Practical List

1. Problem Definition and draw ER /EER diagram
2. Creation of the database: using constrains and triggers
3. Advanced SQL – must cover Views, nested and recursive queries.
4. Implementing an application and integrating with the database using JDBC, Dynamic and embedded SQL
5. Any one Database Hashing technique
6. Implementing and index using B or B+ trees.
7. Creating and querying an Object database. – Use ODL and OQL (Paper Exercise-Assignment)

8. Implementing a Distributed Database.
9. Demonstration of database security techniques – SQL injection, inference attacks etc.
10. Problem Definition for a Data Warehouse, Construction of Star Schema Model.
11. Creation of a DW and running OLAP operations on them (Roll up, Drill down, Slice, Dice, pivot)

Tools used:

1. Any Database software like Oracle, DB2, SQL Server, MY SQL or any other open source tools.
2. Programming to be done in JAVA.

Theory Examination:

1. Question paper will comprise of 6 questions, each carrying 20 marks.
2. Total 4 questions need to be solved.
3. Q.1 will be compulsory, based on entire syllabus wherein sub questions of 2 to 3 marks will be asked.
4. Remaining question will be randomly selected from all the modules.
5. Weightage of marks should be proportional to number of hours assigned to each module.

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
TEITC505	Open Source Technologies	03 Hr/Week	02 Hr/Week	---	03	01	---	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
TEITC505	Open Source Technologies	20	20	20	80	25	25	---	150

Course Objectives:

1. To introduce the concept of open Source Software.
2. To enable students to learn Linux Environment.
3. To make students well versed with Android and Shell Programming

Course Outcomes: On successful completion of this course students should be able:

1. To develop android applications.
2. To install and work on Linux.
3. To perform Shell Programming.

DETAILED SYLLABUS

Sr. No.	Module	Detailed Content	Hours
1.	Over View of Open Source Software	Need of Open Sources –Advantages of Open sources – Applications- FOSS – FOSS usage –Free Software Movement – Comercial Aspect of Open Source Movement – Licensing – Certification – Open Source Software Development Model – comparision with close source / Proprietary software – Free Software – Open source vs source –available –Widely used open source software license :Apache License, BSD license, GNU General Public License, GNU Lesser General Public License, MIT License, Eclipse Public License and Mozilla Public License.	04
2.	Open Source Operating System	Installation of Linux (Redhat-CentOS): Theory about Multiboot Enviroment, Hardisk Partitioning, Swap space, LVM, and Bootloader Command Line: Basic File System Manamgnet Task, Working with files, Piping and Redirection, Working with VI editor, use of sed and understanding FHS of Linux	04
3.	Open Source Operating System: system Administrator task	Job management, Process Mangment, Mounting Devices and filesystem working with Linux, Backup, working with user, group and permission, Managing Software. Understanding Boot process and related files, Common kernel Manamgnet Task	04
4.	Open source Operating System: Network and Security Administration	Basic networking commands, Configuration of Apache Web servers, DNS servers, DHCP servers, mail Servers, NFS, FTP servers. Securing servers with IPtables. Setting up cryptographic services, SSL, Managing Certificate with OpenSSL, working with the GNU Privacy guard.	06

5.	Open Source Operating System: Shell Programming	Bash Shell Scripting, Executing Script, Working with Variables and Input, Using Control Strutures, Script control, handling with signals, Creating functions, working sed and gawk -Working with web using shell script: Downloading web page as formatted text file and parsing for data, working cURL etc.	08
6.	Open source Tools Only in LAB	Version Control using RCS and CVS (hands on RCS in single Machine) Content management : Understanding working of Drupal (Basic Drupal components) Security assessment : OpenVAS IDE :Working of Eclipse	---
7.	Open Source Mobile Programming	Android programming: Setting up Android Enviroment (using Eclipse for android development), Activites and Intents, User Interface, Designing UI using views, Data Persistence, Conent Providers, messaging and networking, Location-based Services, Publishing Android Applications	10

Text Books:

1. Redhat Linux 6.0 Administration Wiley
2. Linux Shell scripting Cookbook: Sarath Lakshman PACKT
3. Linux Lab - Open source Technology : Ambavade -Dreamtech
4. Beginning Adnorid Development Wrox Press

References:

1. Drupal guide to Planning and Building Web Site: Wrox Press

Term Work: 25 Marks (Total marks) = 15 Marks (Experiment and Case Studies) + 5 Marks (Assignments) + 5 Marks (Attendance)

Suggested Practical List :

1. Linux command line : File System, Process Managment User Administration

2. Setting Up Web server, DNS server, FTP Servers

3. Working with IPTABLES, OpenVAS

4. Version Control

5. Working with Drupal

6. Shell Script

7. Andorid Setup

8. Programning in Andorid

9. Programming in Android

Theory Examination:

1. Question paper will comprise of 6 questions, each carrying 20 marks.
2. Total 4 questions need to be solved.
3. Q.1 will be compulsory, based on entire syllabus wherein sub questions of 2 to 3 marks will be asked.
4. Remaining question will be randomly selected from all the modules.
5. Weightage of marks should be proportional to number of hours assigned to each module.

Course Code	Course/Subject Name	Credits
TEITC506	**Business Communication &Ethics**	**2**

Pre-requisite

- FEC206 Communication Skills

Objective

1. To inculcate in students professional and ethical attitude, effective communication skills, teamwork, skills, multidisciplinary approach and an ability to understand engineer's social responsibilities.
2. To provide students with an academic environment where they will be aware of the excellence, leadership and lifelong learning needed for a successful professional career.
3. To inculcate professional ethics and codes of professional practice
4. To prepare students for successful careers that meets the global Industrial and Corporate requirement' provide an environment for students to work on Multidisciplinary projects as part of different teams to enhance their team building capabilities like leadership, motivation, teamwork etc.

Outcomes:A learner will be able to …..

1. communicate effectively in both verbal and written form and demonstrate knowledge of professional and ethical responsibilities
2. Participate and succeed in Campus placements and competitive examinations like GATE, CET.
3. Possess entrepreneurial approach and ability for life-long learning.
4. Have education necessary for understanding the impact of engineering solutions on Society and demonstrate awareness of contemporary issues.

DETAILED SYLLABUS:

Module	Unit No.	Topics	Hrs
1.0	**1.0**	**Report Writing**	**08**
	1.1	Objectives of report writing	
	1.2	Language and Style in a report	
	1.3	Types of reports	
	1.4	Formats of reports: Memo, letter, project and survey based	
2.0	**2.0**	**Technical Proposals**	**02**
	2.1	Objective of technical proposals	
	2.2	Parts of proposal	
3.0	**3.0**	**Introduction to Interpersonal Skills**	**08**
	3.1	Emotional Intelligence	
	3.2	Leadership	

	3.3	Team Buliding	
	3.4	Assertiveness	
	3.5	Conflict Resolution	
	3.6	Negotiation Skills	
	3.7	Motivation	
	3.8	Time Management	

4.0	**4.0**	**Meetings and Documentation**	**02**
	4.1	Strategies for conducting effective meetings	
	4.2	Notice	
	4.3	Agenda	
	4.4	Minutes of the meeting	
5.0	**5.0**	**Introduction to Corporate Ethics and etiquettes**	**02**
	5.1	Business Meeting etiquettes,Interview etiquettes,Professional and work etiquettes,Social skills	
	5.2	Greetings and Art of Conversation	
	5.3	Dressing and Grooming	
	5.4	Dinning etiquette	
	5.5	Ethical codes of conduct in business and corporate activities (Personal ethics,conflicting values,choosing a moral response,the process of making ethical decisions)	
6.0	**6.0**	**Employment Skills**	**06**
	6.1	Cover letter	
	6.2	Resume	
	6.3	Group Discussion	
	6.4	Presentation Skills	
	6.5	Interview Skills	
		Total	**28**

List of Assignments

1. Report Writing (Synopsis or the first draft of the Report)
2. Technical Proposal (Group activity,document of the proposal)
3. Interpersonal Skills (Group activity and Role play)
4. Interpersonal Skills (Documentation in the form of soft copy or hard copy)
5. Meetings and Documentation (Notice,Agenda,Minutes of Mock Meetings)
6. Corporate ethics and etiquettes (Case study,Role play)
7. Cover Letter and Resume
8. Printout of the PowerPoint presentation

Term Work
Term work shall consist of all assignments from the list.

The distribution of marks for term work shall be as follows:

- Assignments **:** **20 marks**
- Project Report Presentation**:** **15 marks**
- Group Discussion**:** **10 marks**
- Attendance **:** **05 marks**

The final certification and acceptance of term work ensures the satisfactory performance of work assigned and minimum passing in the term work.

Reference Books:

1. Fred Luthans, "*Organisational Behavior"* , Mc Graw Hill, edition
2. Lesiker and Petit, "*Report Writing for Business"* , Mc Graw Hill, edition
3. Huckin and Olsen, "*Technical Writing and Professional Communication"*, Mc Graw Hill
4. Wallace and Masters, "*Personal Development for Life and Work"* , Thomson Learning, 12th edition
5. Heta Murphy, "*Effective Business Communication"* , Mc Graw Hill, edition
6. R.C Sharma and Krishna Mohan, "*Business Correspondence and Report Writing",*
7. B N Ghosh, "*Managing Soft Skills for Personality Development*", Tata McGraw Hill.Lehman, Dufrene, Sinha, "*BCOM*", Cengage Learning, 2nd edition
8. Bell .Smith,"Management Communication" Wiley India Edition,3rdedition.Dr.K.Alex ,"Soft Skills",S Chand and Company
9. Dr.KAlex,"SoftSkills",S Chand and Company