MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI
TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES

COURSE NAME : COMPUTER ENGINEERING GROUP

COURSE CODE : CO

DURATION OF COURSE : 6 SEMESTERS For CO and 8 SEMESTERS for CD   **WITH EFFECT FROM 2012-13**

SEMESTER : SIXTH   **DURATION : 16 WEEKS**

PATTERN : FULL TIME - SEMESTER   **SCHEME : G**

SR. NO	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)		SW (17600)
				TH	TU	PR		Max	Min	Max	Min	Max	Min	Max	Min	
1	Management $	MAN	17601	03	--	--	03	100	40	--	--	--	--	--	--	
2	Software Testing	STE	17624	03	--	02	03	100	40	50#	20	--	--	25@	10	
3	**Elective (Any One)**															
	Embedded System	ESY	17626	03	--	02	03	100	40	--	--	--	--	25@	10	
	Advanced Microprocessor	AMI	17627	03	--	02	03	100	40	--	--	--	--	25@	10	50
4	Advanced Java Programming β	AJP	17085	03	--	04	--	--	--	50#	20	--	--	50@	20	
5	Linux Programming	LPR	17096	01	--	04	--	--	--	50#	20	--	--	25@	10	
6	Industrial Project β	IPR	17097	--	--	04	--	--	--	--	--	50#	20	50@	20	
7	Entrepreneurship Development β	EDE	17098	01	01	--	--	--	--	--	--	--	--	25@	10	
	TOTAL			14	01	16	--	300	--	150	--	50	--	200	--	50

Student Contact Hours Per Week: **31 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks :**750**

@- Internal Assessment, # - External Assessment,   No Theory Examination, $ - Common to all branches, #* Online Examination,
β - Common to CM/IF/CW/CD

Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, OR-Oral, TW- Term Work, SW- Sessional Work.
- ➤ Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subjects is to be converted out of 50 marks as sessional work (SW).
- ➤ Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms.
- ➤ Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code.

Course Name : All Branches of Diploma in Engineering / Technology

Course Code : EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ME/PG/PT/AE/CE/CS/CR/CO/CM/IF/

                CW/EE/EP/EU/CH/CT/PS/CD/ED/EI/CV/FE/IU/MH/MI/TX/TC/FG

Semester   : Sixth for EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ME/PG/PT/AE/CE/CS/CR/

                CO/CM/IF/CW/EE/EP/EU/CH/CT/PS/TX/TC/FG and Seventh for

                MH/MI/CD/ED/EI/ CV/FE/IU

Subject Title : Management

Subject Code : 17601

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	--	03	100	--	--	--	100

NOTE:

➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

        Management concepts are universal and it is a multidisciplinary subject. They are equally applicable to different types industries like Manufacturing, Service and Trade as well as different kind of business activities like industry, army, school, hospital, retail shops etc. Also, at the end of diploma course polytechnic students are expected to enter in to the Industrial Environment. This environment is altogether different and new to the students. A proper introduction and understanding of management fundamentals is therefore essential for all these students.
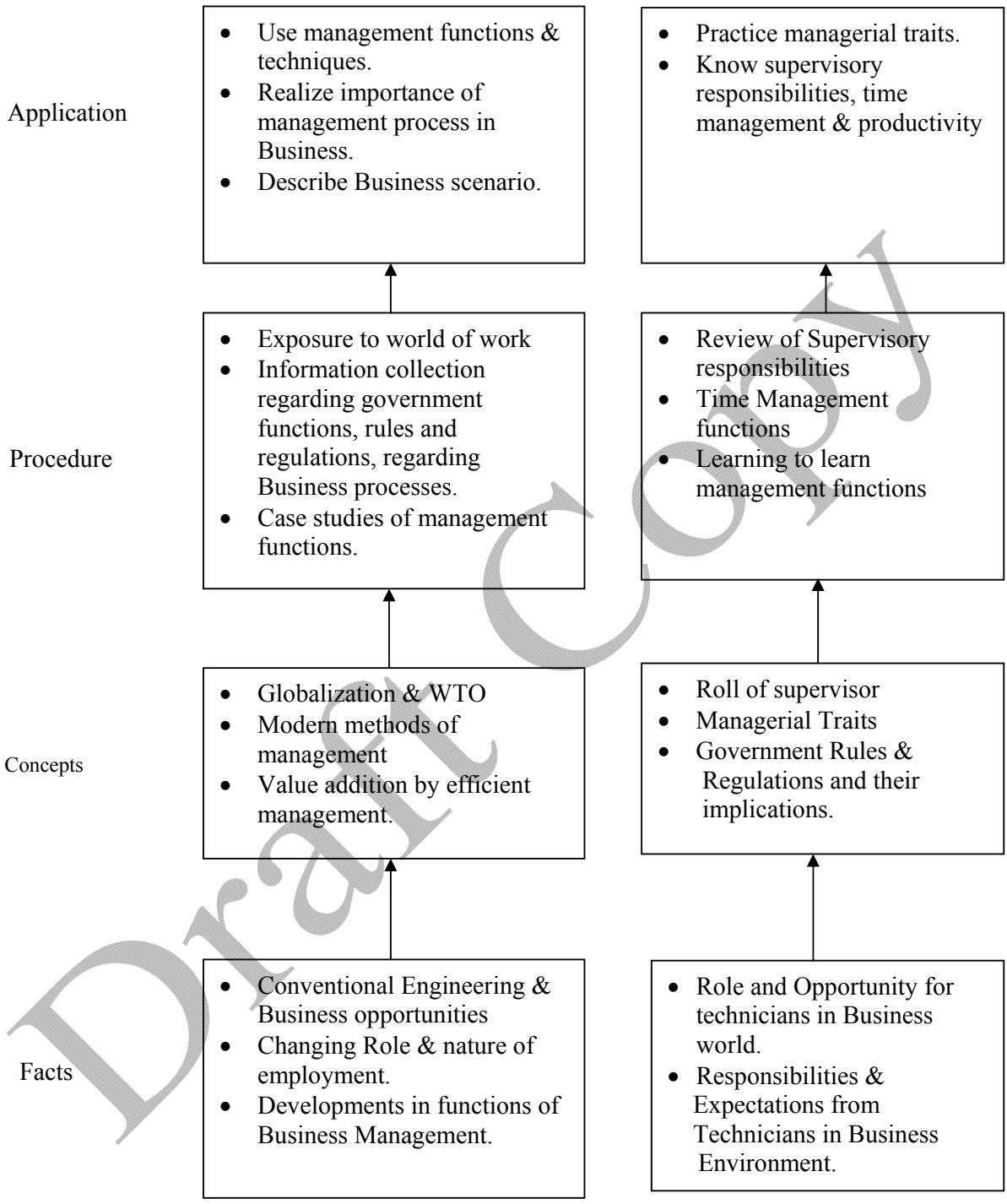
Contents of the this subject will enable the students to address various issues related to human resource, finance, materials, legislations etc. by use of basic principles of management. This will ensure that students will play their role effectively to enhance the quality of business output in total.

Objective:

The students will able to:

      1. Get familiarized with environment related to business processes.
      2. Know the management aspects of the organisations.
      3. Understand Role & Responsibilities of a Diploma engineer.
      4. Understand importance of quality improvement techniques.
      5. Appreciate need and importance of safety in industries.
      6. Understand process of Industrial finance and its management.
      7. Know the latest trends in industrial management.

Learning Structure:

Application

Use management functions & techniques.	Practice managerial traits.
• Use management functions & techniques.	• Practice managerial traits.
• Realize importance of management process in Business.	• Know supervisory responsibilities, time management & productivity
• Describe Business scenario.	

↑ ↑

Procedure

• Exposure to world of work	• Review of Supervisory responsibilities
• Information collection regarding government functions, rules and regulations, regarding Business processes.	• Time Management functions
• Case studies of management functions.	• Learning to learn management functions

↑ ↑

Concepts

• Globalization & WTO	• Roll of supervisor
• Modern methods of management	• Managerial Traits
• Value addition by efficient management.	• Government Rules & Regulations and their implications.

↑ ↑

Facts

• Conventional Engineering & Business opportunities	• Role and Opportunity for technicians in Business world.
• Changing Role & nature of employment.	• Responsibilities & Expectations from Technicians in Business Environment.
• Developments in functions of Business Management.	

Contents: Theory

Topic and Contents	Hours	Marks

Topic 1: Overview of Business
 	
Specific Objectives
  ➢ State various business types and sectors
  ➢ Describe importance of globalisation
1.1. Types of Business
  • Service
  • Manufacturing
  • Trade
1.2. Industrial sectors Introduction to
  • Engineering industry
  • Process industry
  • Textile industry
  • Chemical industry
  • Agro industry
  • IT industry
  • Banking, Insurance, Retail, Hospitality, Health Care
1.3 Globalization
  • Introduction
  • Advantages & disadvantages with respect to India
	02	06

Topic 2: Management Process
 	
Specific Objectives
  ➢ State various management principles
  ➢ Describe different management functions
2.1 What is Management?
  • Evolution
  • Various definitions of management
  • Concept of management
  • Levels of management
  • Administration & management
  • Scientific management by F.W.Taylor
2.2 Principles of Management (14 principles of Henry Fayol)
2.3 Functions of Management
  • Planning
  • Organizing
  • Directing
  • Controlling
  • Decision Making
	08	16

Topic 3: Organisational Management
 	
Specific Objectives
  ➢ Compare different forms of organisation , ownership for a specific business
  ➢ Describe types of departmentation
3.1 Organization :
  • Definition
	08	16

• Steps in organization
3.2 Types of organization
  • Line
  • Line & staff
  • Functional
  • Project
3.3 Departmentation
  • By product
  • By process
  • By function
3.4 Principles of Organisation
  • Authority & Responsibility
  • Span of Control
  • Effective Delegation
  • Balance ,stability and flexibility
  • Communication
3.5 Forms of ownership
  • Proprietorship
  • Partnership
  • Joint stock
  • Co-operative Society
  • Govt. Sector		

Topic 4: Industrial Safety and Legislative Acts
 	
Specific Objectives
  ➢ Describe types of accidents & safety measures
  ➢ State provisions of industrial acts.
4.1 Safety Management
  • Causes of accidents
  • Types of Industrial Accidents
  • Preventive measures
  • Safety procedures
4.2 Industrial Legislation - Necessity of Acts
Important Definitions & Main Provisions of following acts:
  • Indian Factory Act
  • Workman Compensation Act
  • Minimum Wages Act
	08	14

Topic 5: Financial Management (No Numerical)
 	
Specific Objectives
  ➢ Explain functions of financial management
  ➢ State the sources of finance & types of budgets.
  ➢ Describe concepts of direct & indirect taxes.
5.1 Financial Management- Objectives & Functions
5.2 Capital Generation & Management
  • Types of Capitals - Fixed & Working
  • Sources of raising Capital - Features of Short term, Medium Term & Long Term Sources
5.3 Budgets and accounts
  • Types of Budgets
	08	16

• Fixed & Variable Budget - Concept • Production Budget - Sample format • Labour Budget - Sample format • Profit & Loss Account & Balance Sheet - Meaning, sample format, meaning of different terms involved. 5.4 Meaning & Examples of – • Excise Tax • Service Tax • Income Tax • Value Added Tax • Custom Duty			
Topic 6: Materials Management (No Numerical) **Specific Objectives** ➢ Describe concept of inventory, ABC analysis & EOQ. ➢ Describe purchase functions & procedures ➢ State features of ERP & MRP 6.1. Inventory Concept, its classification, functions of inventory 6.2 ABC Analysis - Necessity & Steps 6.3 Economic Order Quantity Concept, graphical representation, determination of EOQ 6.4 Standard steps in Purchasing 6.5 Modern Techniques of Material Management • Material Resource Planning (MRP) - Functions of MRP, Input to MRP, Benefits of MRP • Enterprise Resource Planning (ERP) - Concept, list of modules, advantages & disadvantages of ERP	08	16	

Topic 7: Quality Management
 	
Specific Objectives
➢ State Principles of Quality Management
➢ Describe Modern Technique & Systems of Quality Management
7.1 Meaning of Quality
   Quality Management System – Activities, Benefits
   Quality Control - Objectives, Functions, Advantages
   Quality Circle - Concept, Characteristics & Objectives
   Quality Assurance – Concept, Quality Assurance System
7.2 Meaning of Total Quality and TQM
   Components of TQM – Concept, Elements of TQM, Benefits
7.3 Modern Technique & Systems of Quality Management like Kaizen,5'S',6 Sigma
7.4 ISO 9001:2000 - Benefits, Main clauses.
	06	16	

Total	**48**	**100**	

Learning Resources:
Books:

Sr. No	Author	Name of Book	Publisher
01	Dr. O.P. Khanna	Industrial Engineering & Management	Dhanpat Rai & Sons New Delhi
02	Banga & Sharma	Industrial Engineering & Management	Khanna Publication
03	Dr. S.C. Saksena	Business Administration & Management	Sahitya Bhavan Agra
04	W.H. Newman E. Kirby Warren Andrew R. McGill	The process of Management	Prentice- Hall

E Source:

nptel.iitm.ac.in
http://iete-elan.ac.in/subjects/amIndustrialMgmt.htm

Course Name   : Computer Engineering Group

Course Code   : CO/CD/CM/IF

Semester   : Sixth for CO/CM/IF and Seventh for CD

Subject Title   : Software Testing

Subject Code   : 17624

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	50#	--	25@	175

NOTE:

> **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
> **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**
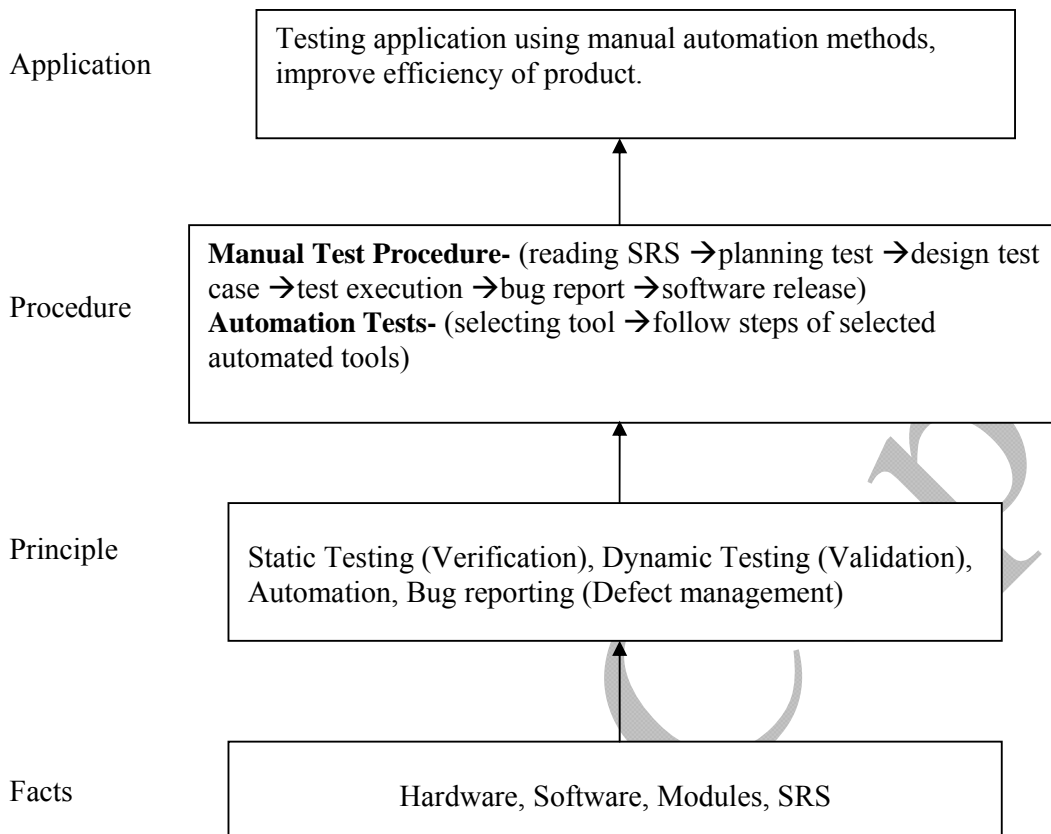
Rationale:

The complexity and size of today's software makes writing secure, bug-free code is extremely difficult, in such a situation testing of software before release is very essential. Software testing can be considered as "Quality Gate" which will pass / release only quality software. Students will learn how to find bugs/errors in any computer program, how to plan an effective test approach, how to clearly report findings and to tell when software is ready to release. Also it introduces various levels and types of testing so that students will be able to practically apply appropriate testing method on application. It also covers manual testing as well as expanding manual test efforts with various automation tools.

Objectives:

Students will be able to:
1. Understand how software testing fits into the software development process.
2. Learn various types and levels of software testing.
3. Develop the skills to find bugs in any type of software.
4. Learn how to effectively plan tests, communicate the bugs you find.
5. Use your new testing skill to test not just the software but also the product specification, the raw code and even the user's manual.
6. Understand STLC, test planning, test case writing and testing execution and defect management.
7. Understand the various automated testing tools to improve testing efficiency.

Learning Structure:

Application ───────── | Testing application using manual automation methods, improve efficiency of product. |

Procedure ───────── | **Manual Test Procedure-** (reading SRS →planning test →design test case →test execution →bug report →software release)
Automation Tests- (selecting tool →follow steps of selected automated tools) |

Principle ───────── | Static Testing (Verification), Dynamic Testing (Validation), Automation, Bug reporting (Defect management) |

Facts ───────── | Hardware, Software, Modules, SRS |

Theory:

Topic No.	Contents	Hours	Marks

1	**Basics of Software Testing**
	Objectives:
	   ➢ **Understand the concept of Software Testing**
	   ➢ **Understand the importance of Quality Software**
	1.1 Software Quality, Definition of Software Testing, Role of Testing
	1.2 Failure, Error, Fault, Defect, Bug Terminology
	1.3 Objectives of Testing
	1.4 Test Case
	1.5 When to Start and Stop Testing of Software (Entry and Exit Criteria)
	1.6 Skills for Software Tester
	1.7 Quality Assurance, Quality Control, Verification and Validation, V Model
		04	10

2	**Types of Testing**
	Objectives:
	   ➢ **Understand the basic types of testing for software.**
	   ➢ **Differentiate White box and Black box testing**
	2.1 White Box Testing : Classification of White Box Testing
	   1. Static Testing- Inspections, Structured Walkthroughs, Technical Review
	   2. Structural Testing-Code Functional Testing, Code Coverage Testing, Code Complexity Testing
	2.1 Black Box Testing: Techniques for Black Box Testing Requirement Based Testing, Positive and Negative Testing, Boundary Value Analysis, Decision Tables, Equivalence Partitioning, User Documentation Testing, Graph Based Testing. Sample Examples on White and Black Box Testing.
		08	20

3	**Levels of Testing and Special Tests**
	Objectives :
	   ➢ **Understand the various levels of testing.**
	   ➢ **Understand some of special tests.**
	3.1 Unit Testing: Driver, Stub
	3.2 Integration Testing: Decomposition Based Testing - Top-Down Integration, Bottom-Up Integration, Bi-Directional Integration, Incremental Integration, Non-Incremental Integration
	3.3 System Testing: Recovery Testing, Security Testing, Performance Testing, Load Testing, Stress Testing, Usability Testing, Compatibility Testing
	3.4 Acceptance Testing: Acceptance criteria, Alpha Testing an Beta Testing
	3.5 Special Tests: Smoke Testing and Sanity Testing, Regression Testing, Usability Testing, GUI Testing, Object Oriented Application Testing: Client-Server Testing, Web based Testing
		12	24

4	**Test Management**
	Objectives:
	   ➢ **Design and execute test cases.**
	   ➢ **Understand the Test Report Process for recommending the product Understand the process of test planning.**
		12	20

	➢ **Identify resources for test plan implementation and decide the staffing for release.** 4.1 Test Planning : Preparing a Test Plan, Scope Management, Deciding Test Approach, Setting Up Criteria for Testing, Identifying Responsibilities, Staffing, Training Needs, Resource Requirements, Test Deliverables, Testing Tasks 4.2 Test Management: Choice of Standards, Test Infrastructure Management, Test People Management, Integrating with Product Release 4.3 Test Process: Base Lining a Test Plan, Test Case Specification, Update of Traceability 4.4 Test Reporting: Recommending Product Release. Matrix, Executing Test Cases, Collecting and Analyzing Metrics, Preparing Test Summary Report		
5	**Defect Management** **Objectives:** ➢ **Find, handle and report defect by using standard technique.** ➢ **Understand the Defect life cycle.** 5.1 Introduction, Defect Classification, Defect Management Process 5.2 Defect Life Cycle, Defect Template 5.3 Estimate Expected Impact of a Defect, Techniques for Finding Defects, Reporting a Defect	06	14
6	**Testing Tools and Measurements** **Objectives:** ➢ **Understand the shortcomings of manual testing.** ➢ **Understand the use of automated test tools.** 6.1 Limitations of Manual Testing and Need for Automated Testing Tools 6.2 Features of Test Tool: Guideline for Static and Dynamic Testing Tool 6.3 Advantages and Disadvantages of Using Tools 6.4 Selecting a Testing Tool 6.5 When to Use Automated Test Tools, Testing Using Automated Tools 6.6 What are Metrics and Measurement: Types of Metrics, Project Metrics, Progress and Productivity Metrics	06	12
	Total	**48**	**100**

List of Practicals:

Sr. No.	Title of Experiments	No. of Hours
1	To Study Software Testing concepts, types and methods.	02
2	To study any one sample system specification and design the test cases for it. (e.g. Student information system, Library management system, Hospital management system etc.)	02
3	To design test cases for any application such as railway reservation form	02
4	To write test cases on simple calculator application.	02
5	To design test cases for any login form (Eg: Gmail or Yahoo login form)	02

6	To design test cases for mobile phone system (Eg: check battery is inserted in mobile properly, check SIM is inserted properly, check incoming and outgoing call)	02
7	To design test cases for notepad/WordPad/MS-Word application.	04
8	To design test cases for paint application.	04
9	To design test cases for ATM machine.	04
10	Using any testing tool, atomize and run test cases for notepad / wordpad.	04
11	Using any freeware automation testing tool, atomize and run test cases for Ms-Word application	04
	Total	**32**

NOTE: All above Practicals may be performed on Windows or Linux Platform, using the tools mentioned in Table 2 Testing Softwares below.

Learning Resources:
1. Books:

Sr. No.	Author	Title	Publisher
1	Srinivasan Desikan Gopalaswamy Ramesh	Software Testing: Principles and Practices	PEARSON
2	M. G. Limaye	Software Testing: Principles, Techniques and Tools	Tata McGraw-Hill
3	Naresh Chauhan	Software Testing: Principles and Practices	Oxford

2. Testing Softwares:

Sr. No	Testing Tool	Types of Tools
1	Selenium	Freeware
2	Mantis Bug Tracker	Freeware
3	IBM Rational Functional Tester	Freeware
4	MS-Excel	Commercial
5	Bugzila	--
6	Test Director	--

Note: Other possible available testing tools can be used at institute level.

3. Web Resources:
1. http://www.selenium.com
2. http://en.wikipedia.org/wiki/Test_automation
3. http://en.wikipedia.org/wiki/Software_testing#Testing_tools
4. http://www.softwaretestingsoftware.com

Course Name : Diploma in Computer Engineering

Course Code : CO/CD

Semester   : Sixth

Subject Title : Embedded System (Elective)

Subject Code : 17626

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

NOTE:

> ➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

> ➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

Now a day, we are surrounded with most of the embedded systems such as microwave oven, washing machine, DVD Player, Mobile Phone, I-Pod so on. In the earlier days, the embedded systems were designed using microprocessors like 8085, Z80 etc. Since the early eighties, small scale embedded has used microcontrollers such as Intel 8031, 8051, 8052 or Motorola 68HC05.

The advent in last few years of technology that embeds low level and high level processing hardware elements and Application Specific Processor in to single chip has given the added dimension to the embedded system that are multiprocessor system on a single VLSI chip called as System On Chip (SOC)and are smart as well as highly sophisticated.
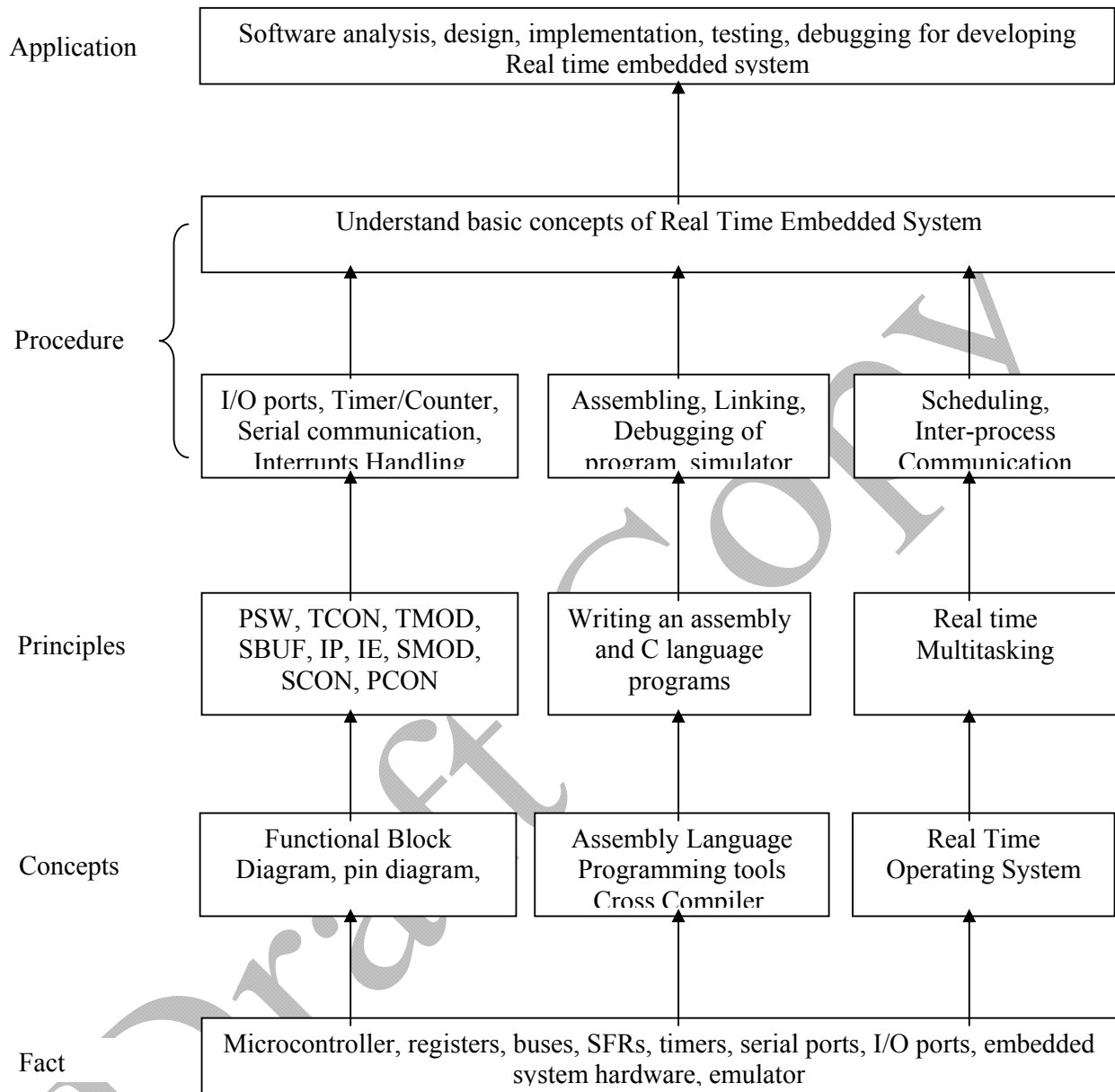
Embedded System deals with computer hardware with software embedded in it. This subject will introduce the 8051 microcontroller architecture, hardware overview of 8051, memory organization, instruction set, interrupts, timers, I/O ports, Serial communication protocols and embedded system with Real Time Operating System (RTOS).

General objectives:

The students will be able to

1. Know the hardware overview of 8051.
2. Write embedded program in C or Assembly language.
3. Understand the function of embedded system hardware such as processor, I/O devices, Watchdog timer, Oscillator, Reset circuitry, Power supply.
4. Know memory organization in 8051.
5. Interface various devices using serial and parallel ports.
6. Understand the concept of Real Time Operating System.

Learning Structure:

Application — Software analysis, design, implementation, testing, debugging for developing Real time embedded system

Procedure — Understand basic concepts of Real Time Embedded System

- I/O ports, Timer/Counter, Serial communication, Interrupts Handling
- Assembling, Linking, Debugging of program, simulator
- Scheduling, Inter-process Communication

Principles

- PSW, TCON, TMOD, SBUF, IP, IE, SMOD, SCON, PCON
- Writing an assembly and C language programs
- Real time Multitasking

Concepts

- Functional Block Diagram, pin diagram,
- Assembly Language Programming tools Cross Compiler
- Real Time Operating System

Fact — Microcontroller, registers, buses, SFRs, timers, serial ports, I/O ports, embedded system hardware, emulator

Contents: Theory

Name of Topics	Hours	Marks

Topic 1: 8051 - Microcontroller
Objective: Students will be able to
    ➢ Draw the architecture of 8051
    ➢ Identify the functions of different pins of 8051
    ➢ Identify status of different flags
1.1 Introduction to 8051 family Microcontroller
1.2 8051 Microcontroller
    • Salient features
    • Pins description,
    • Architecture of 8051
    • Special function Register (SFR)
    • Memory Organization
    • I/O Ports, Timer/counters, Interrupt structure
    • Serial Port Interface
    • Boolean Operation
    • Power Down Operation
	08	16

Topic 2: Instruction Set of 8051
Objective: Students will be able to
    ➢ Use the different types of instructions
    ➢ Interpret addressing modes of instructions
    ➢ Write syntax of the instructions
2.1 Instruction Set of 8051
    • Programmers model of 8051
    • Operand types
    • Assembler Directives
    • Addressing modes
    • Data transfer, Arithmetic, logical, Control transfer instructions
    • Simple programs such as addition, subtraction, multiplication, division in assembly and 'C'
    • Execution of program using cross compiler like Keil IDE, SPJ, RIDE
	08	16

Topic 3: I/O Ports, Timers/Counters, Interrupts and Serial Communication programming
Objective: Students will be able to
    ➢ Configure the different ports as input or output
    ➢ Use of timer/ counter in different modes
    ➢ Understand interrupts handling
3.1 Port Structure and Simple I/O port programming
3.2 Timer/Counter Programming in assembly and C
3.3 Serial Port programming in assembly and C
3.4 Interrupt programming in assembly and C
	10	16

Topic 4: 8051 Interfacing Application
Objective: Students will be able to
    ➢ Understand the interfacing of display
    ➢ Learn the function of ADC and DAC
    ➢ Know the application of Stepper motor
4.1 Interfacing of seven segment display & LCD display Interfacing diagram & pin out of 2x16 LCD
4.2 Interfacing of 4x4 Keyboard, ADC & DAC- interfacing diagram &
	08	16

programming.		
4.3 Interfacing of stepper motor- interfacing diagram & Programming function		

Topic 5: Embedded Systems
Objective: Students will be able to
  ➢ Know the embedded system
  ➢ Learn different software and hardware development tools
  ➢ Understand embedded software development cycle
5.1 Introduction to Embedded System, Processor in system, different Hardware Units, advantages, Applications, Software embedded into system, System-On-Chip, Concept of Device Driver
5.2 Software & Hardware development tools , IDE, Compiler, Debugger, Simulator, Emulator, In circuit Emulator(ICE), Target Board, Device Programmer
5.3 Embedded software development cycle
	08	18

Topic 6: RTOS & Inter-process Communication
Objective: Students will be able to
  ➢ Understand the concepts of RTOS
  ➢ Know the concept multitasking, task synchronization
  ➢ Understand the concepts of deadlock, starvation
6.1 Concepts of RTOS, Need of RTOS in Embedded systems
6.2 Multitasking
6.3 Task synchronization & Mutual Exclusion
6.4 Starvation, Deadlock, Multiple process
6.5 Basics of Inter-process Communication
	06	18

Total	**48**	**100**

Practical:

Skills to be developed:

Intellectual skills:

1. Use of programming language constructs in program implementation.
2. To be able to apply different logics to solve given problem.
3. To be able to write program using different implementations for the same problem
4. Study different types of errors as syntax semantic, fatal, linker & logical
5. Debugging of programs
6. Understanding different steps to develop program such as

   - Problem definition
   - Analysis
   - Design of logic
   - Coding
   - Testing
   - Maintenance (Modifications, error corrections, making changes etc.)

Motor skills:

1. Proper handling of Computer System.

List of Practical

It is expected that students should perform following practical's using pc and any cross C complier such as Keil, SPJ, RIDE etc.

1. Write a Program to toggle bits of P1 continuously forever with some delay.

2. Write a Program to generate square wave of 1 kHz on pin P1.0.
3. Write a program that continuously gets 8 bit data from Port 0 and sends it to Port 1, while simultaneously creating square wave of 200 μsec on pin P2.1. Use timer 0 to create square wave.
4. Write a program that will generate a square wave with a period of 20 ms on pin P3.0 using Timer 1 interrupt.
5. Write a program to turn ON the LED connected to Port P1.3 pin on the occurrence of INT1 and turn OFF the LED after a delay of 20 msec.
6. Write a program to transfer the message "MSBTE" serially at baud rate 4800, 8 bit data, 1 stop bit.
7. Write a Program for Interfacing ADC
8. Write a Program for interfacing DAC to generate Saw tooth, Square wave, triangular wave, staircase wave.
9. Write a Program to Interface 4x4 matrix keyboard.
10. Write a Program to display "WELCOME" on 2x16 LCD.
11. Write a Program to Interface stepper motor in clockwise and anti-clockwise direction

Learning Resources:
Books:

Sr. No.	Name of Book	Author	Publication
1	The 8051 Microcontroller and Embedded System using Assembly and C (Second Edition)	Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay	Pearson Education
2	The 8051 Microcontroller and Embedded System using assembly and C	Kenneth J. Ayala Dhananjay V Gadre	Cengage Learning India Pvt. Ltd.
3	Introduction to Embedded Systems	Shibu K.V.	Tata McGraw Hill
4	Embedded Systems Architecture, Programming, Design	Raj Kamal	Tata McGraw Hill

Websites:
1. http://www.embeddedindia.com/
2. http://www.esacademy.com/
3. www.EmbeddedTechJournal.com

Course Name : Diploma in Computer Engineering

Course Code : CO/CD

Semester   : Sixth

Subject Title : Advanced Microprocessor (Elective)

Subject Code : 17627

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

NOTE:

➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

Microprocessors are heavily used in Computers, Xerox machines, ATM machines, high end medical devices etc. It is evolved from 4 bit to 64 bit microprocessor. The rapid progress in microprocessor leads to many advanced microprocessors and microcontrollers that give user a good interface to make functions and controlling operations easy and fast.

The 8086 microprocessor has certain limitations. So the microprocessors like 80286, 80386, 80486 and Pentium are evolved. The 80286 was milestone in the microprocessor. Many techniques like memory protection, multitasking, segmentation introduced in 80286 and carry forward even in the latest microprocessors. Advanced microprocessors are the current requirement of the market.
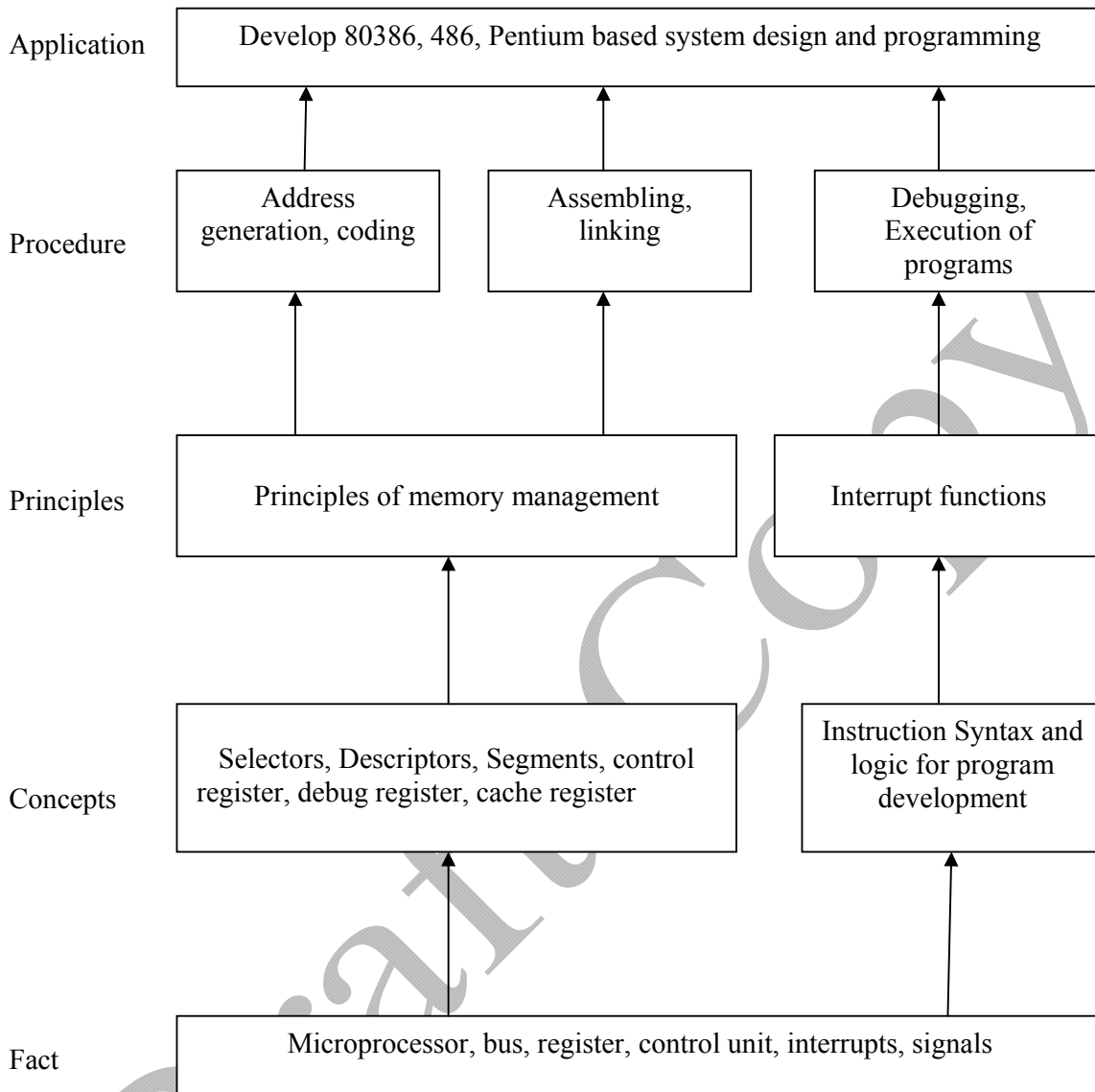
This subject covers the concepts of advanced microprocessors and their architecture, memory management, interrupts etc. It also covers interesting programming on interrupts of x86 microprocessor.

General Objectives:

Students will be able to:

1. Explain memory management and concept of pipelining.

2. Understand the concept of paging.

3. Understand the superscalar architecture of Pentium.

4. Design a program in assembly language using different functions of DOS and BIOS.

Learning structure:

Application | Develop 80386, 486, Pentium based system design and programming

Procedure | Address generation, coding | Assembling, linking | Debugging, Execution of programs

Principles | Principles of memory management | Interrupt functions

Concepts | Selectors, Descriptors, Segments, control register, debug register, cache register | Instruction Syntax and logic for program development

Fact | Microprocessor, bus, register, control unit, interrupts, signals

Contents:

Topic No.	Name of the Topic	Hours	Marks
1	**32-bit Microprocessor - Intel 80386.** Salient features, internal architecture, Register organization (General-purpose register, segment register, status and control register, instruction pointer. Segment descriptor cache register. System address registers LDTR, GDTR, Debug register, Test registers, control registers. **Addressing modes of 80386**, real, PVAM, paging, virtual 8086 mode. Address translation in real, PVAM, paging, Enabling and disabling paging (Machine Status word)	14	30
2	**Introduction to Pentium Processor** Salient features of Pentium, System architecture, Superscalar Execution, Separate code & data cache, Floating Point Exceptions, Branch prediction. Introduction to Pentium-pro processor, Special Pentium-pro features, Introduction to Pentium -2 processor, Pentium – 3 processor, Intel MMX Architecture.	16	32
3	**RISC Architecture** The advantages of RISC, Basic features of RISC processors, Hybrid architecture- RISC and CISC convergence, Design Issues of RISC processors, Features of sun Ultra SPARC	10	18
4	**Interrupts of X86 Microprocessor:** Introduction to X86 interrupts (Hardware, software and exceptions), Interrupt vector table, Interrupt processing sequence. Hardware or exception interrupts (Singles step, divide by zero/overflow, non-maskable, breakpoint, overflow) software interrupts (INT, INTO instructions) introduction to.com and.exe programs, DOS& BIOS Interrupts- INT 21H, INT 25H, INT 26H, INT 10H, INT 16H, INT 17H.	08	20
	Total	48	100

Skills to be developed:
Intellectual skills:

1. Use of programming language constructs in program implementation.
2. To be able to apply different logics to solve given problem.
3. To be able to write program using different implementations for the same problem
4. Study different types of errors as syntax semantic, fatal, linker & logical
5. Debugging of programs
6. Understanding different steps to develop program such as
   - Problem definition
   - Analysis
   - Design of logic
   - Coding
   - Testing
   - Maintenance (Modifications, error corrections, making changes etc.)

Motor Skills:
1. Proper handling of Computer System.

List of Practical:
1. Write an ALP to read password & validate the user.
2. Write an ALP to display the status of keys described in 02H functions of BIOS INT 16H.
3. Write an ALP to simulate CLS (Clear Screen) command.
4. Write an ALP to simulate DEL (Delete file) and REN (Rename file) command.
5. Write an ALP to display the attribute and date/ time of any file.
6. Write an ALP to simulate MD (Make directory), RD (Remove Directory) commands.
7. Write an ALP to simulate CD (Change directory) and PWD (Present Working Directory) commands.
8. Write an ALP to display the status of Flag register and Machine Status Word register of 286 on the screen.
9. Write an ALP to display the status of Flag register and Machine Status Word register of 386 on the screen.
10. Write an ALP to demonstrate CPUID instruction of Pentium Processor

Learning Resources
Reference Books:

Sr. No.	Name of Book	Author	Publication
1	Advanced microprocessor & peripheral	A. K. Ray. K. M. Bhurchandi	TATA McGraw Hill
2	IBM PC Assembly Language and Programming	Peter Abel	Prentice Hall India
3	The Pentium Processor	James L. Antanakos	Pearson Publication

2. Websites:
1. www.intel.com
2. www.pcguide.com/ref/CPU
3. www.CPU-World.com/Arch/
4. www.techsource .com / engineering- parts/microprocessor.html

Course Name : Computer Engineering Group

Course Code : CO/CM/CW/IF/CD

Semester : Sixth for CO/CM/CW/IF and Seventh for CD

Subject Title : Advanced Java Programming

Subject Code : 17085

Teaching and Examination Scheme

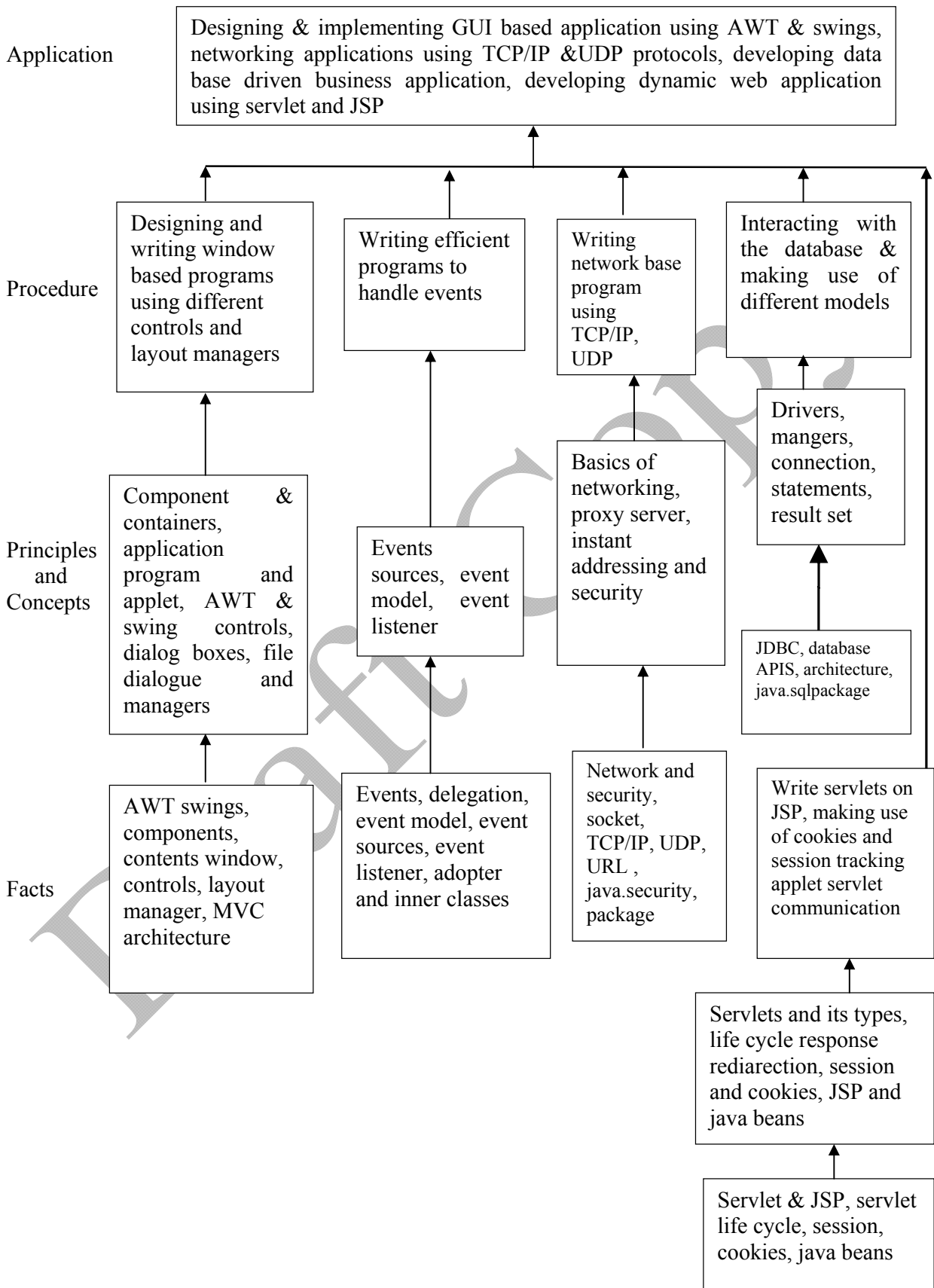| Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	--	--	50#	--	50@	100

Rationale:

Now days, Internet has touched every aspect of life. If we are not connected to internet, it is like we are nowhere. Online presence is a must for businesses. If your enterprise is not online, you are far behind. Web presence has dominated the businesses worldwide.

Java technology is more suitable for web applications development. It has market dominance in the development of online applications. Java is the preferred choice of the programmers and the enterprises globally.

This subject will equip the students with the required knowledge and the skill needed for the development of robust, powerful and scalable enterprise level web applications. It gives students hands-on experience on GUI Technologies viz. AWT and Swings, event handling mechanisms and network programming. Security issues are also taken into considerations.

The most important aspect of web applications - Database Interaction - is also nicely covered. The performance critical areas of the online applications which the Java technology deals with the ease and in a flexible manner by the use of advanced server side components - servlets - are also systematically covered. The students will be able to understand the concepts like servlet chaining, filtering, sessions, cookies and the most important Applet - Servlet communication. Students will also learn the JSP and the Java Beans.

Learning Structure:

Application

Designing & implementing GUI based application using AWT & swings, networking applications using TCP/IP &UDP protocols, developing data base driven business application, developing dynamic web application using servlet and JSP

Procedure

Designing and writing window based programs using different controls and layout managers

Writing efficient programs to handle events

Writing network base program using TCP/IP, UDP

Interacting with the database & making use of different models

Principles and Concepts

Component & containers, application program and applet, AWT & swing controls, dialog boxes, file dialogue and managers

Events sources, event model, event listener

Basics of networking, proxy server, instant addressing and security

Drivers, mangers, connection, statements, result set

JDBC, database APIS, architecture, java.sqlpackage

Facts

AWT swings, components, contents window, controls, layout manager, MVC architecture

Events, delegation, event model, event sources, event listener, adopter and inner classes

Network and security, socket, TCP/IP, UDP, URL , java.security, package

Write servlets on JSP, making use of cookies and session tracking applet servlet communication

Servlets and its types, life cycle response rediarection, session and cookies, JSP and java beans

Servlet & JSP, servlet life cycle, session, cookies, java beans

Contents: Theory

Topic No.	Name of the Topic	Hours	Marks
01	**Introduction to Abstract Windowing Toolkit(AWT) & Swings** Specific Objective ➜ To design & develop Graphical user interface (GUI) programs using AWT and swing component. ➜ To arrange the GUI components using different layout managers. 1.1 Component, container, window, frame, panel. 1.2 Creating windowed programs & applets. 1.3 AWT controls & layout managers Understanding the use of AWT controls: labels, buttons, checkbox, checkbox group, scroll bars, text field, text area Understanding the use of layout managers: flowLayout, borderLayout, gridLayout, cardLayout, gridbagLayout, menubars, menus, dialog boxes, file dialog. 1.4 Introduction to swing Swing features, MVC Architecture, Combo Boxes, progress bar, tool tips, seperator, tables, trees, toggle button.	16	24
02	**Event Handling** Specific Objective ➜ To write event driven programs using the delegation event model. ➜ To learn the concept of adapter classes & the inner classes. 2.1 The delegation Event Model Event sources, Event listeners, Event classes. The Action Event class, The Component Event class, the Container Event class, the Focus Event class, the Item Event class, the Key Event class, the Mouse Event class, the Text Event class, the Window Event class. 2.2 Adapter classes 2.3 Inner classes 2.4 Event listener interfaces The ActionListener Interface, the ComponentListener Interface, the ContainerListener Interface, the FocusListener Interface, the ItemListener Interface, the KeyListener Interface, the MouseListener Interface, the MouseMotion Interface, the TextListener Interface, the WindowsListener Interface, the WindowFocusListener Interface	10	20

03	**Networking & Security** Specific Objective: ➢ To learn the Java's built in support for network programming. ➢ To learn about SOCKETS, TCP, ISP, URL and the Java security package. 3.1 Basics of Networking Socket, IP, TCP, UDP, Proxy Server, Internet Addressing 3.2 The InetAddress Class Factory methods Instance methods 3.3 TCP/IP Sockets Socket, Server Socket, methods 3.4 URL URL Connection, http, URL Connection methods, creating & using TCP/IP client & server 3.5 Security with Java: Theoretical introduction to java.security Package Permission class Policy class	08	16	
04	**Interacting with Database** Specific Objective : ➢ To create database driven business applications using the database API'S two tier and three tier models and the Java.Sql package 4.1 JDBC, ODBC, & Other APIS JDBC two tier & three tier models 4.2 Connecting to Database Driver Interface, Driver Manager class, Connection Interface, Statement Interface, the java.sql.package Establishing connection & retrieving information Resultset interface.	06	20	
05	**Servlets & JSP** Specific Objectives : ➢ To write web based applications using servlets, JSP and Java Beans. ➢ To learn about cookies session tracking. 5.1 Servlet Type of Servlet, Servlet life cycle. 5.2 Using servlets, response redirection. 5.3 Basic concepts of sessions, cookies & session tracking 5.4 Introduction to servlet chaining & filters, Introduction to applet servlet communication. 5.5 JSP, expression, directives& declarations, Life cycle of a JSP page TLD & JSTL, Java beans.	08	20	
	Total	**48**	**100**	

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Write a program to design a form using the components textfield, label, checkbox ,button, list.	4
2	Write a program to demonstrate the use of Border layout showing four buttons at four sides of an applet with captions left, right, top and bottom.	4
3	Write a program to perform addition of two nos. make use of textfield and button.	4
4	Write a program using AWT to create a menubar in a frame where menubar contains menu items such as File, Edit, View and the submenu under the File menu item should contain New and Open	4
5	Write a program using swing to display a JcomboBox in an applet with the items – cricket, football, hockey, tennis	4
6	Write a program to create a Jtree and recognize mouse clicks on it.	4
7	Write a program to create a JTable On JApplet Window.	4
8	Write a program to display the key pressed on Applet Window.	4
9	Write a program making use of Adapter class.	4
10	Write a program to retrieve hostname and IP Address in InetAddress class.	4
11	Write a program to use URL connection class and display 1) Protocol 2) HostName 3) PortNumber 4) File Name.	4
12	Write a program that demonstrates TCP/IP based communication between Client and Server. Client send "HELLO" to Server and Server replies "HI…" to Client.	4
13	Write a program to send data to Table "XYZ" in database using prepared statement and retrieve data from same Table "XYZ" and display on screen.	4
14	Write a Servlet to display the user name and password accepted from the client.	4
15	Write a Servlet for demonstrating the concept of Session and Cookie.	4
16	Write a simple Program to design a login JSP pages.	4
	Total Hours	**64**

Learning Resources:
Books to be referred:

Sr. No	Author	Title	Publisher
1	Herbert Sheild	Complete Reference	Tata McGraw
2	Kogent learning Solution	Advance JAVA	DreamTech Press
3	Sharnam Shah & Vaishali Shah	Java EE6 for Beginners	SPD
4	Kogent learning Solution	Java Server Programming Black Book	DreamTech Press

Practical Contents:
Student will install the following software under the guidance of their Teacher.

1) JDK 1.5 or higher, JRE (JAVA SOFTWARE)
2) NetBeans (or any IDE)
3) Database (any one)
4) Tomcat web Server
5) Special attention on Servlet and JSP from Projects point of view.

Course Name : **Computer Engineering Group**

Course Code : **CO/CD/CM/CW**

Semester : **Sixth for CO/CM/CW and Seventh for CD**

Subject Title : **Linux Programming**

Subject Code : **17096**

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	04	--	--	50#	--	25@	75

NOTE:

➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**
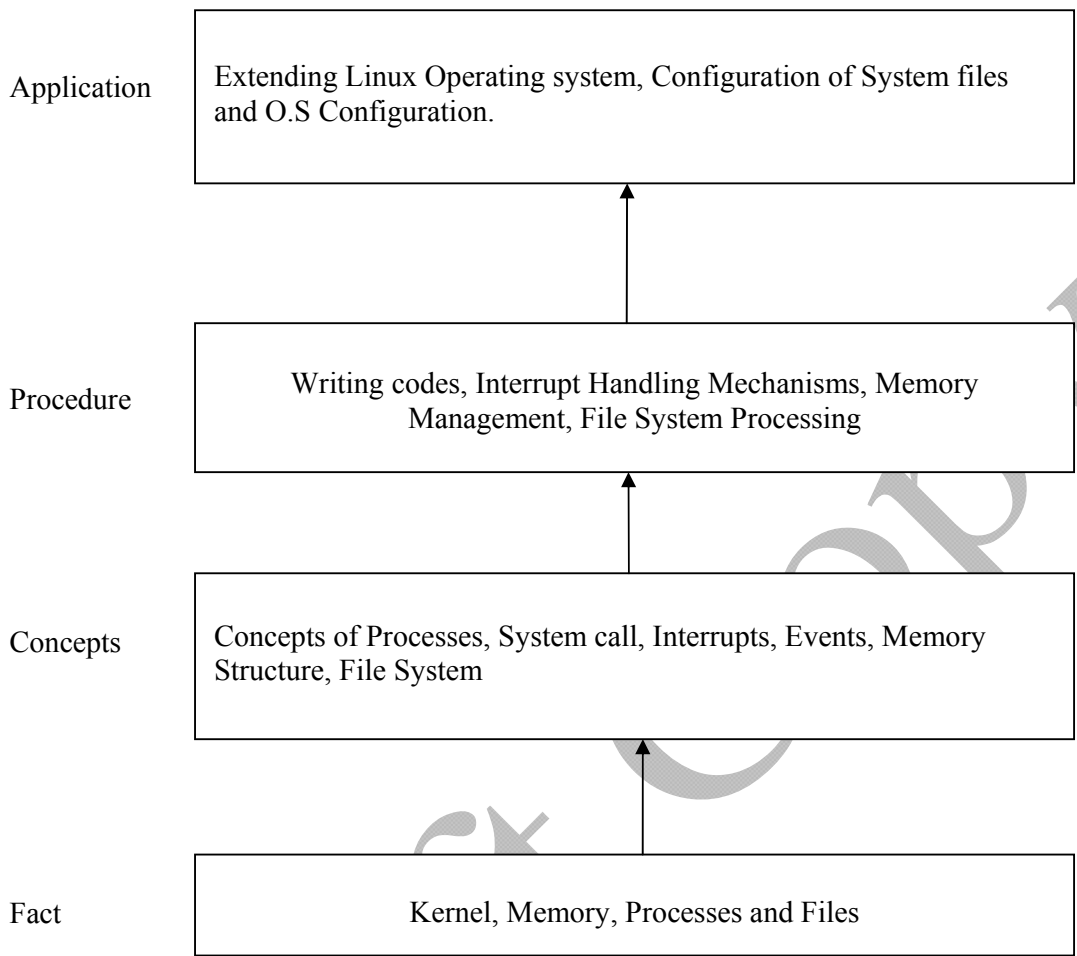
Rationale:

Linux is one of the most successful open source operating system which includes all the features of modern operating systems like virtual memory, virtual file systems, lightweight processes, signals, inter process communications etc. Linux is well supported and demand for Linux programmer is increasing. This subject aims at extending the knowledge of operating systems and give students exposure to Kernel and system calls. Probing beyond the superficial features, students will get valuable insights into how things really work inside their machine. Thus Advanced Linux programming aims at giving students practice of writing codes that directly talk to the kernel.

General Objectives:

Students will be able to

1. Understand Kernel Basics.

2. Understand use of System Calls.

3. Understand file operations as carried by Linux O.S.

4. Understand Memory Management Basics, processes and process handling.

5. Understand interrupt handlers and exception handling.

Learning Structure:

Application	Extending Linux Operating system, Configuration of System files and O.S Configuration.

↑

Procedure	Writing codes, Interrupt Handling Mechanisms, Memory Management, File System Processing

↑

Concepts	Concepts of Processes, System call, Interrupts, Events, Memory Structure, File System

↑

Fact	Kernel, Memory, Processes and Files

Contents:

Sr. No.	Name of Topic/Sub topic	Hrs

1	**Linux Shell and Commands Overview**
	
	Objectives :
	
	   ➤ Describe shell and its basic.
	
	   ➤ Implement process related commands.
	
	   ➤ Mount and Unmount media.
	
	1.1 About Linux
	
	Looking in to the Linux kernel
	
	The GNU Utilities
	
	The Linux Desktop environment
	
	1.2 Linux Distributions
	
	Core Linux distribution
	
	Specialized Linux distribution
	
	The Linux console
	
	1.3 Monitoring Program
	
	Peeking at the processes
	
	Real time process monitoring
	
	Stopping processes
	
	1.4 Monitoring Disk Space
	
	Monitoring media
	
	Using the df command
	
	Using the du command
	
	1.5 Working with the data Files
	
	Storing Data
	
	Searching the Data
	
	Compressing Data
	
	Archiving Data
		02

Sr. No.	Name of Topic/Sub topic	Hrs

2	**Environment Variables and File permissions**
	Objectives :
	  ➢ Implement Set and unset Local and Global Environment Variables.
	  ➢ State special files and utilities to track and manage user accounts.
	  ➢ State special files and utilities to track and manage groups.
	  ➢ Describe use of Linux File security system.
	2.1 Environment variables
	   Global environment variables
	   Local environment variables
	   Setting Environment Variables
	   Setting Local environment variables
	   Setting Global environment variables
	2.2 Removing Environment Variables
	   Default Shell Environment Variables
	   Setting the PATH Environment Variables
	2.3 Local System Environment Variables
	   Logging Shell
	   Interactive Shell
	   Non- Interactive Shell
	   Variable Arrays, Using Command Aliases
	2.4 Linux Security
	   The /etc/passwd file ,The /etc/shadow file
	   Adding a new user, Removing the user
	   Modifying the user
	2.5 Using Linux Groups
	   The /etc/group file
	   Creating New group
	   Modifying group
	2.6 Decoding File Permission
	   Using File Permission symbols
	   Default File Permission
	   Changing Security Setting
	   Changing permission
	   Changing ownership and sharing files
		02

Sr. No.	Name of Topic/Sub topic	Hrs

3	**Script Building and Conditional Commands**
	Objectives :
	  ➢ Write and execute script files.
	  ➢ Use Input-Output Redirection and pipes.
	  ➢ Use Mathematical Operations in a shell script.
	3.1 Using Multiple Commands, Creating a Script File
	   Displaying Messages
	3.2 Using Variables
	   Environmental Variables, User Variables
	   The back tick
	3.3 Redirecting Input and Output
	   Output Redirection, Input Redirection
	   Pipes
	3.4 Performing Math
	   The expr command ,Using brackets
	   A floating-point solution
	   Existing the script
	   Checking the exit status
	   The exit command
	3.5 Working with the if-then Statement
	   The if-then-else Statement
	   Nesting ifs
	3.6 The test Command
	   Numeric comparisons
	   String comparisons
	   File comparisons
	3.7 Compound Condition Testing
	   Advanced if-then features
	   Using double parentheses
	   Using double brackets
	   The case Command
		04

Sr. No.	Name of Topic/Sub topic	Hrs

4	**Looping commands and Working with User Input**
	
	Objectives :
	
	➢ Use iterations in shell script.
	
	➢ Use structured commands to control the flow of shell script.
	
	➢ Write script for handling command line parameter.
	
	➢ Write script for interacting with the user.
	
	4.1 The for Command
	
	  Reading values in a list , Reading complex values in a list
	
	  Reading a list from a variable
	
	  Reading a value from command
	
	  Changing The field separator
	
	  Reading the directory using the wildcards
	
	4.2 The while Command
	
	  Basic while formats
	
	  Using multiple test command
	
	  The until command
	
	  Nesting Loops
	
	  Looping on File Data
	
	  Controlling the loop
	
	  The break command
	
	  The continue command
	
	  Processing the Out of a Loop
	
	4.3 Command Line Parameters
	
	  Reading parameter
	
	  Reading the program name
	
	  Testing parameter
	
	4.4 Special Parameter Variable
	
	  Counting parameters
	
	  Grabbing all the data
	
	Being shifty
		04

Sr. No.	Name of Topic/Sub topic	Hrs

5	**Presenting data and Creating functions**
	Objectives :
	➤ Use data redirection to the file.
	➤ Create own redirection.
	➤ Build basic screen functions.
	➤ Create function library**.**
	
	5.1 Understanding Input and Output
	        Standard file description
	        Redirecting errors
	Redirecting Output in script
	5.2 Creating your Own Redirection
	        Creating output file descriptors
	        Redirecting file description
	        Creating a read /write file description
	        Closing file description
	    Listing Open file description
	5.3 Suppressing Command Output
	Using Temporary
	        Creating a local temporary file
	        Creating a temporary file in /tmp
	        Creating a local temporary directory
	Logging Message
	5.4 Basic Script Function
	        Creating Function
	        Using function
	Returning value
	        The default exit status
	        Using the return command
	        Using function Output
	5.5 Using a Variable Function
	        Passing parameter to a Function
	        Handling Variable in a Function
	Array Variable And Function
	        Passing Array to a Function
	        Returning Array from Function
	Function Recursion
		02

Sr. No.	Name of Topic/Sub topic	Hrs

6	**Using sed and gawk, Writing Scripts for System Administrator**
	Objectives :
	    ➤ Use sed and gawk tools to manipulate contents of text files.
	    ➤ Use command line editor for working with text elements.
	    ➤ Write script for system administration**.**
	6.1 Text manipulation
	    The sed editor
	    The gawk program
	6.2 The sed Editor Basic
	    More substitution option
	    using address
	    Deleting line
	    Inserting and appending text
	    Changing line
	    The transfer command
	    Printing revisited
	    Using files with sed
		02

	Total	**16**

List of Practicals:
Intellectual Skills

1. Implement various Linux commands.

2. Create user accounts and assign various permission

3. Write shell scripts

4.

Motor Skills
Effective use of computer system and proper use of Linux operating system

Sr. No.	Title of Experiment	No. of Hours
1	Implement following commands with their options: • ps and kill. • df and du. • mount and umount.	04
2	Implement grep and tar.	04
3	Implement setting of global and local environment variable, shell environment variables.	04
4	• Create users, groups .Set permissions and ownership. • View the /etc/passwd file and describe its syntax. • View the /etc/shadow file and describe its syntax. • View the /etc/group file and describe its syntax.	04
5	Implement setting up and releasing of special permissions (SGID, SUID and sticky bit) and state their effects.	04
6	Implement I/O Redirection and Pipes.	04

7	• Write shell script to demonstrate use of conditional and loop control statements. • Write a shell script that shows effects of quotes on the Output of a variable. • Write a shell script that looks through all the files in the current directory for the string POSIX and then prints the name of these files to the standard output.	06
8	Write shell script to implement following test commands : • For string comparisons. • For numeric comparisons. • For file comparisons	06
9	Write shell script that : • Uses command line parameters. • Counts number of parameters. • Implements shift command. • Implements processing option with parameter values.	04
10	Write shell script : • To implement redirection of Input script. • For redirecting file descriptors. • Creating input file descriptor.	06
11	Practice sed editor and gawk utility.	06
12	• Write a shell script using functions. Modify it to handle function with parameters, function returning values. • Write shell script for handling array variables. • Write shell script that uses function returning true or false result.	06
13	• Write a shell script which checks disk space and store the value to the variable and display it. • Write a shell script that tests connectivity with the PCs whose IPs are provided as command line parameters.	06
	Total	**64**

Learning Resources:
Books:

Sr. No.	Author	Title	Publisher
1	Richard Blum	Linux: Command Line and Shell Scripting	Wiley India
2	Richard Pearson	Linux : Complete Reference	Tata McGraw Hill
3	Jon Emmons Terry Clark	Easy Linux Commands	SPD Publication
4	Neil Mathew	Beginning Linux Programming	Wiley India

Course Name : **Computer Engineering Group**

Course Code : **CO/CM/IF/CW/CD**

Semester   : **Sixth for CO/CM/IF/CW and Seventh for CD**

Subject Title : **Industrial Projects**

Subject Code : **17097**

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	04	--	--	--	50#	50@	100

Rationale:

In the field of Computer and Information Technology various technologies (hardware and Software) needs to be integrated and proper paradigms needs to be implemented to develop any kind of computer applications . Hence it becomes essential to get hands on experience for developing industrial applications. This subject is essential to understand the implementation of the system development process i.e. analyse, design, coding, debugging and testing. This will help the students to acquire skills and attitudes to work as programmer, Network administrator, Technical assistant.
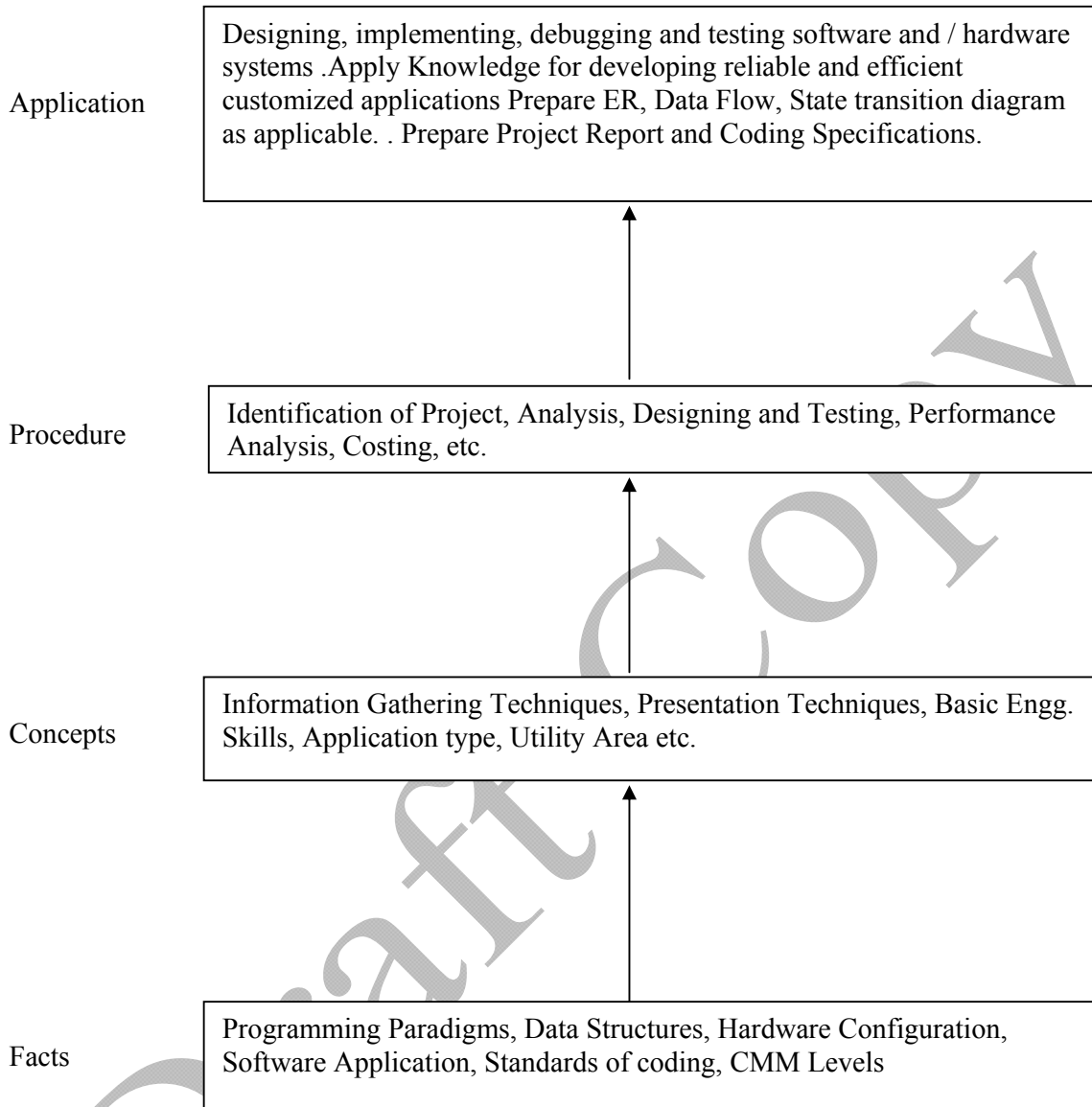
Furthermore the student will be able to find out various sources of technical information and develop self-study techniques to prepare a project and write a project report.

General Objectives:

The students should be able to:

1. Work in Groups, Plan the work, and Coordinate the work.
2. Develop leadership qualities.
3. Develop Innovative ideas.
4. Practically implement the acquired knowledge.
5. Develop basic technical Skills by hands on experience.
6. Document and Write project report.
7. Develop skills to use latest technology in Computer/Information Technology field.
8. Analyse the different types of Case studies.
9. Testing of software and hardware.
10. Maintaining systems and accessories.

Learning Structure:

Application

> Designing, implementing, debugging and testing software and / hardware systems .Apply Knowledge for developing reliable and efficient customized applications Prepare ER, Data Flow, State transition diagram as applicable. . Prepare Project Report and Coding Specifications.

↑

Procedure

> Identification of Project, Analysis, Designing and Testing, Performance Analysis, Costing, etc.

↑

Concepts

> Information Gathering Techniques, Presentation Techniques, Basic Engg. Skills, Application type, Utility Area etc.

↑

Facts

> Programming Paradigms, Data Structures, Hardware Configuration, Software Application, Standards of coding, CMM Levels

Note: **1.** One Project from any one of the following groups.
       2. Form a group of maximum four students.

Contents:

Two hours should be allotted for giving the Instructions for preparing a Project Report (Refer Guideline Document for Format of Project Report)

Group	Projects
Software Oriented Projects	1. Develop Application Software for Hotels / Hospital / Shopping Mall / Cinema Theatre / Commercial Complex / Educational Institute / Industrial Complex / utility services on Mobile / smart phones, mobile phone games, GIS, GSM, CDMA coding for various applications. 2. Develop In-house Systems. 3. Case Studies Related to Industries - Operation / Maintenance / Repair and Fault Finding. (Refer Guideline Document). 4. Develop Information Processing System. 5. Develop Web Based Applications using Web Technologies. 6. Develop Network monitoring system. 7. Develop systems for financial organisation. 8. Develop System Program based system like compilers, editors, spreadsheets, mini database systems. 9. Develop mobile phone based software to transfer pathological data to smart phone of Doctor to take second opinion before prescription 10. Design and Implement Disaster Management software by taking help from Gigapan images which are coming from floated cameras in the cyclones. 11. Design and implement software to check virus and malware of mobile phones 12. Design local language operating system/Graphical User Interface for Tablet PC. 13. Design wearable computers for the physically challenged person. We are assuming that due some accident persons vision is blurred. Here microphone should whisper in the ear of this person by taking input from camera images and anaysing and recognizing places and persons. Here we are assuming wearable computer means with spectacle mountable monitors and wallet size CPU.
Hardware Oriented Projects	1. Develop Intrusion Detection System(IDS) and Intrusion Prevention System(IPS) 2. Develop Speech Recognition System. Focus should be on Machine learning. 3. Develop Image Processing Systems. 4. Develop Expert Systems. Here use cognative concept. 5. Develop Artificial Intelligence based Systems. Use neural network concept here. 6. Develop various types of Interfacing Applications. 7. Develop device Controllers. 8. Design and implement energy saving devices for example people sensing fans and auto-off at the railway station, bus station 9. Holiday sensing traffic light controllers, which will modify automatically traffic lights time according to number of vehicles. We are assuming on holidays traffic is heavy.

	10. Create panoramic images using Gigapan cameras. This camera is giving various frames.
	11. Design automatic human body vital parameters by sensors to dignose the human.
	12. Design cheaper night vision camera suitable for military operations. Keep program in the microcontrollers to process images.
	13. Design operating system for washing machine or refrigerator. This is based on RTOS.
Seminar	Seminar on any relevant latest technical topic based on latest research, recent trends, new methods and developments in the field of Computer Engineering / Information Technology.

Learning Resources:
1. Magazines:

Sr. No.	Magazines
1.	IEEE Transactions/Journals
2.	Computer Today.
3.	PC Quest.
4.	Data Quest
5.	Any Journal Related to Computer/Information Technology/Electronics field.
6.	Computer World
7.	Chip
8.	IT World

2. Website:

Using any search engine, such as http://www.google.co.in/ the relevant information can be searched on the Internet.

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CW/CD

Semester   : Sixth for CO/CM/IF/CW and Seventh for CD

Subject Title : Entrepreneurship Development

Subject Code : 17098

Teaching and Examination Scheme:

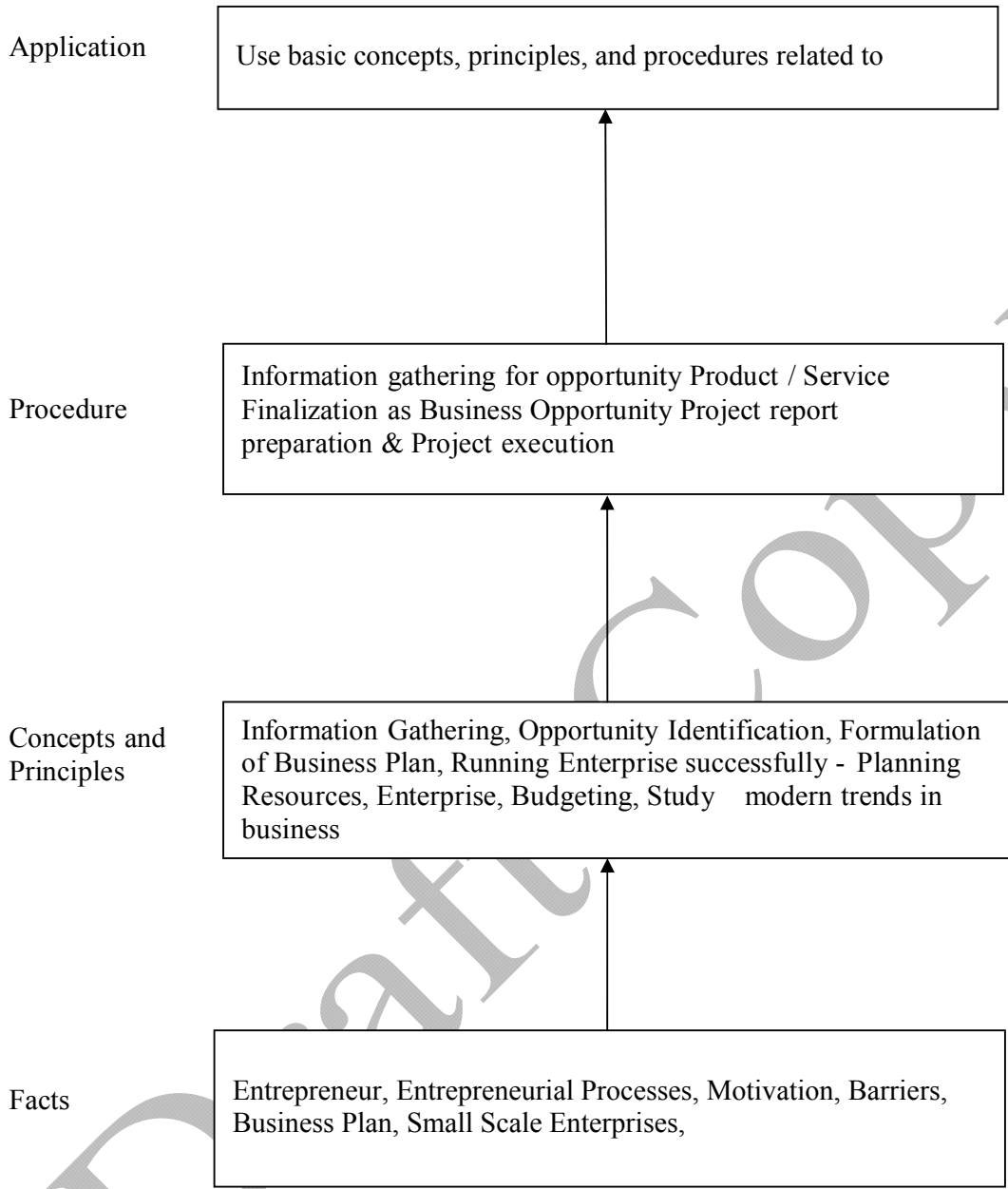| Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
01	01	--	--	--	--	--	25@	25

Rationale:

Globalization, liberalization & privatization along with revolution in Information Technology, have thrown up new opportunities that are transforming lives of the masses. Talented and enterprising personalities are exploring such opportunities & translating opportunities into business ventures such as- BPO, Contract Manufacturing, Trading, Service sectors etc. The student community also needs to explore the emerging opportunities. It is therefore necessary to inculcate the entrepreneurial values during their educational tenure. This will help the younger generation in changing their attitude and take the challenging growth oriented tasks instead of waiting for white- collar jobs. This subject will help in developing the awareness and interest in entrepreneurship and create employment for others.

Objectives:

Students will be able to

1) Identify entrepreneurship opportunity.

2) Acquire entrepreneurial values and attitude.

3) Use the information to prepare project report for business venture.

4) Develop awareness about enterprise management.

Learning Structure:

Application

Use basic concepts, principles, and procedures related to

Procedure

Information gathering for opportunity Product / Service Finalization as Business Opportunity Project report preparation & Project execution

Concepts and Principles

Information Gathering, Opportunity Identification, Formulation of Business Plan, Running Enterprise successfully - Planning Resources, Enterprise, Budgeting, Study modern trends in business

Facts

Entrepreneur, Entrepreneurial Processes, Motivation, Barriers, Business Plan, Small Scale Enterprises,

Topic	Name of Topic	Hours
01	**Entrepreneurship, Creativity & Opportunities** • Concept, Classification & Characteristics of Entrepreneur • Creativity and Risk taking, Risk Situation, Types of risk & risk takers. • Business Reforms. • Process of Liberalization. • Reform Policies. • Impact of Liberalization. • Emerging high growth areas. • Business Idea Methods and techniques to generate business idea. • Transforming Ideas in to opportunities transformation involves • Assessment of idea &Feasibility of opportunity • SWOT Analysis	03
02	**Information and Support Systems** • Information Needed and Their Sources: • Information related to project, Information related to support system, Information related to procedures and formalities • Support Systems • Small Scale Business Planning, Requirements. • Govt. & Institutional Agencies, Formalities • Statutory Requirements and Agencies.	02
03	**Market Assessment** • Marketing - Concept and Importance • Market Identification, Survey Key components • Market Assessment	02

04	**Business Finance & Accounts**
	➢ Business Finance
	  • Cost of Project
	  • Sources of Finance
	  • Assessment of working capital
	  • Product costing
	  • Profitability
	  • Break Even Analysis
	  • Financial Ratios and Significance
	➢ Business Account
	  • Accounting Principles, Methodology
	  • Book Keeping
	  • Financial Statements
	  • Concept of Audit
		03

	Business Plan & Project Report	

05	• Business plan steps involved from concept to commissioning Activity Recourses, Time, Cost
	 • Project Report
	 • Meaning and Importance
	 • Components of project report/profile (Give list)
	
	   5.1) **Project Appraisal**
	
	   1) Meaning and definition
	   2) Technical, Economic feasibility
	   3) Cost benefit Analysis
		03

06	**Enterprise Management And Modern Trends** ➢ Enterprise Management: • Essential roles of Entrepreneur in managing enterprise • Product Cycle: Concept and importance • Probable Causes Of Sickness • Quality Assurance: Importance of Quality, Importance of testing • E-Commerce: Concept and Process ➢ **Global Entrepreneur** • Assess yourself-are you an entrepreneur? • Prepare project report and study its feasibility.	03
	Total	**16**

List of Assignments:
1. Write the SWOT Analysis required for an successful entrepreneur.
2. Collect the required information, formalities and supporting systems for starting a small scale business.
3. Collect information regarding key parameters required for market analysis of an electrical industry.
4. Search for current available sources of finance to start a new business and write a report.
5. Write a report on different accounting methods, financial statements and audit.
6. Write a report on preparing a good business plan.
7. Collect information on E-commerce system and write a report on how it is useful for entrepreneurs.
8. Prepare a report on how to become a successful entrepreneur?

Learning Resources:

1) Books:

Sr. No.	Author	Title	Publisher
1	J. S. Saini B. S. Rathore	Entrepreneurship Theory and Practice	Wheeler Publisher, New Delhi
2	Prepared by Colombo plan staff college for Technician Education.	Entrepreneurship Development	Tata Mc Graw Hill Publishing co. ltd. New Delhi.

3	J. B. Patel D. G. Allampally	A Manual on How to Prepare a Project Report	EDI STUDY MATERIAL Near Village Bhat , Via Ahmadabad Airport & Indira Bridge, P.O. Bhat 382428 , Gujrat,IndiaP.H. (079) 3969163, 3969153 E-mail : ediindia@sancharnet.in/olpe@ediindia.org Website : http://www.ediindia.org
4	Gautam Jain Debmuni Gupta	New Initiatives in Entrepreneurship Education & Training	
5	Schaper, Michael Volery	Entrepreneurship-Small Business	Wiley India,2011
6	Alpana, Trehan	Entrepreneurship	Dreamtech, 2011