MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES

COURSE NAME : DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING

COURSE CODE : CW

DURATION OF COURSE : 6 SEMESTERS **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			EXAMINATION SCHEME									SW (17600)
							PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)		
				TH	TU	PR		Max	Min	Max	Min	Max	Min	Max	Min	
1	Management $	MAN	17601	03	--	--	1&½	50#*	20	--	--	--	--	--	--	50
2	System Programming	SPR	17634	03	--	02	03	100	40	50#	20	--	--	25@	10	
3	Advanced Java Programming β	AJP	17625	03	--	04	02	100#*	40	50#	20	--	--	50@	20	
4	**Elective (Any One)**															
	Distributed Operating System	DOS	17635	03	--	02	03	100	40	--	--	--	--	25@	10	
	Design and Analysis of Algorithms	DAA	17636	03	--	02	03	100	40	--	--	--	--	25@	10	
5	Linux Programming	LPR	17816	01	--	04	--	--	--	50#	20	--	--	25@	10	
6	Industrial Project β	IPR	17817	--	--	04	--	--	--	--	--	50#	20	50@	20	
7	Entrepreneurship Development β	EDE	17818	01	01	--	--	--	--	--	--	--	--	25@	10	
	TOTAL			**14**	**01**	**16**	**--**	**350**	**--**	**150**	**--**	**50**	**--**	**200**	**--**	**50**

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

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks **: 800**

@- Internal Assessment, # - External Assessment, [ ] No Theory Examination, $ - Common to all branches, #* Online Examination, β - Common to CO/CM/IF/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	--	--	1&½	50#*	--	--	--	50

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.

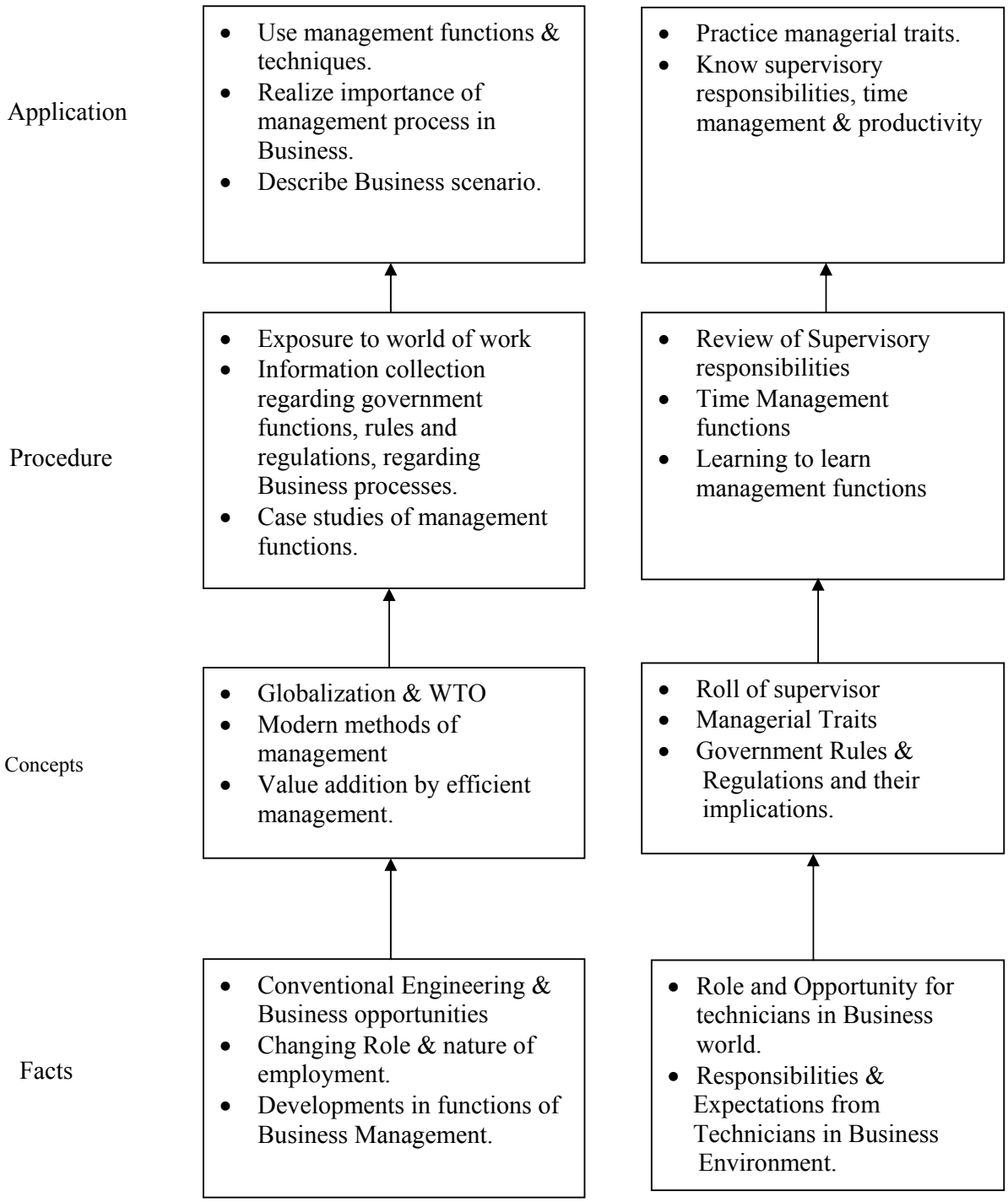
Contents of the this subject will enable the students to address various issues related to human resource, finance, materials, legislations etc. by use of basic principles of management. This will ensure that students will play their role effectively to enhance the quality of business output in total.

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 In dustrial finance and its management.
7. Know the latest trends in industrial management.

Learning Structure:



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	04
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	08
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	08

• 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	06
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	08

• 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	08
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 Marks 04 7.3 Modern Technique & Systems of Quality Management like Kaizen,5'S',6 Sigma 7.4 ISO 9001:2000 - Benefits, Main clauses.	06	08
Total	**48**	**50**

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 : Diploma in Computer Science and Engineering

Course Code : CW

Semester : Sixth

Subject Title : System Programming

Subject Code : 17634

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:

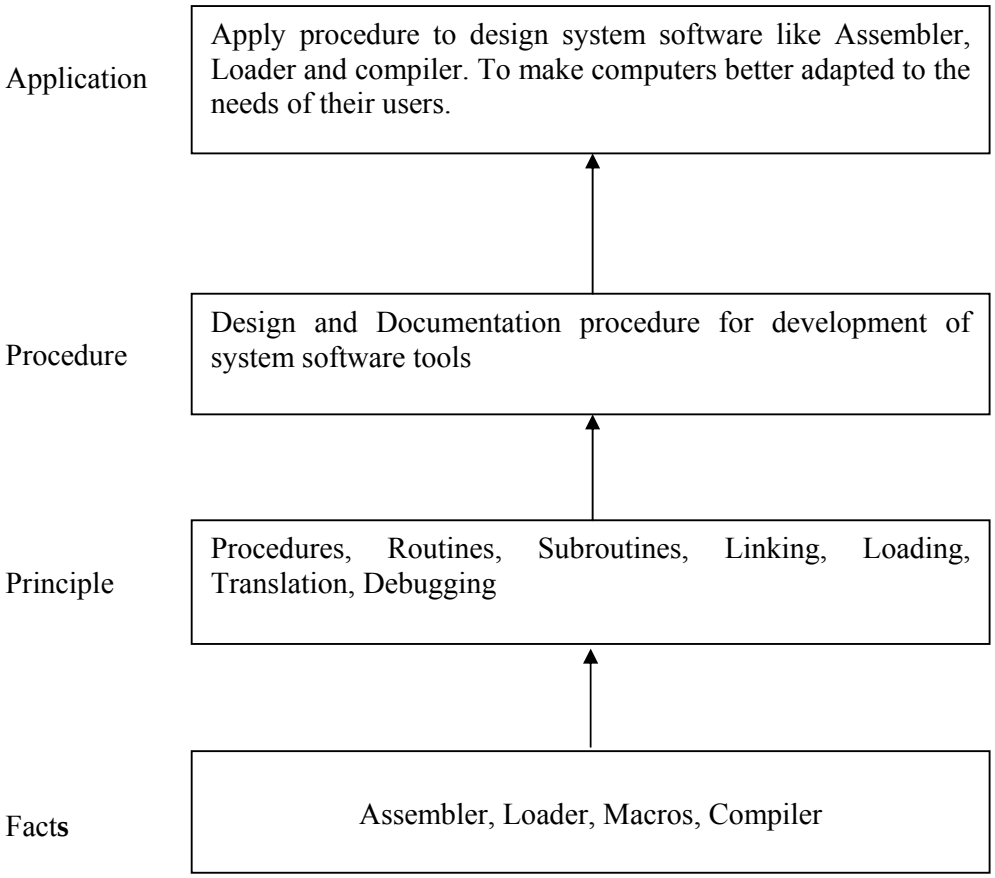
A modern computer has powerful capabilities such as fast CPU, large memory, Input-Output devices and networking support. However, It has to be instructed through the machine language. A common user does not wish to interact with the computer at this level. The System programs are the collection of programs that bridge the gap between the users and the operating system. The main aim of System programming is to understand designing and implementation of software's like assemblers, loaders and compilers. Using system programming students will have an idea about how the system tools coordinates with operating system.

Objectives:

Students will be able to:

1. Understand the concept of machine structure, machine language and assembly language.
2. Define symbols, literals, instructions, and assign addresses.
3. Understand the concept of lexical, syntax and semantic analysis.
4. Differentiate between procedures and subroutines.
5. Understand macros, macro call and expansion.
6. Understand the concepts of Memory allocation, loading and linking.
7. Understand design of compiler, loader, linker and assembler.

Learning Structure:



Theory:

Topic No	Contents	Hours	Marks
1	**Introduction to System Programming** **Objectives:** ➢ Recognize the need of system programming. ➢ Understand the role of language processors. 1.1 What is System Software? Goals of System Software. 1.2 Components of System Software : Assemblers, Loader, compiler, Macro processor 1.3 Evolution of System Software and Operating System 1.4 Foundations of system Programming, Machine Structure	04	10
2	**Assembler** **Objectives:** ➢ Introduce Single pass and Two-Pass assembler ➢ Understand the general assembly scheme 2.1 General design procedure 2.2 Design of the assembler :Statement of the problem; Data Structure; Format of databases; Algorithm; Look for modularity 2.3 Table Processing: Searching and Sorting - Linear Search; Binary Search Sorting: Interchange sort; Shell sort; Bucket sort; Radix exchange sort; Address calculation sort; Comparisons of sort; Hash or Random entry searching	10	20
3	**Macro Language and Macro Processors** **Objectives:** ➢ Comprehend the definition and expansion of macros instructions ➢ Gain insight into design of macro preprocessor 3.1 Macro Instructions 3.2 Features of a Macro facility - Macro Instruction Arguments; Conditional macro expansion; Macro call within Macros; Macro Instruction defining Macros 3.3 Implementation - Implementation of restricted faculty: Two Pass Algorithm, A Single Pass Algorithm, Implementation of macro calls within Macros, Implementation within an assembler	10	20
4	**Loaders and Linking** **Objectives:** ➢ Understand the concepts and requirements of loading and linking ➢ Gain insight into the design of linker 4.1 Loaders Schemes : "Compile and go" loaders; General Loader Schemes; Absolute Loaders; Subroutine linkages; Relocating loaders; Direct linking loaders; Other loaders scheme: Binders, Linking loaders Overlays, Dynamic Binders 4.2 Design of Absolute loaders 4.3 Design of Direct Linking Loaders: Specification Problem; Specification of data structures; Format of database; Algorithm	10	20

5	**Compiler** **Objectives:** ➢ Understand the aspects of compilation of high-level languages. ➢ Describe the various phases of compilers. ➢ Discuss about memory allocation scheme used in compilers. 5.1 Statement of a problem: Recognizing basic elements; Recognizing Syntactic units and Interpreting meaning; Intermediate from: Arithmetic statements, Non-Arithmetic statement, Non-executable statements; Storage Allocation; Code Generation: Optimization(M/c independent), Optimization (M/c dependent); Assembly Phase; General Model of Compiler. 5.2 Phases of Compiler: Lexical Phase: Tasks, Databases, Algorithm; Syntax Phase: Databases, Algorithm; Interpretation Phase: Databases, Algorithm; Optimization: Databases, Algorithm; Storage Assignment: Databases, Algorithm; Code Generation: Databases, Algorithm; Assembly Phase: Databases, Algorithm; Passes of a Compiler	12	24
6	**Parsing** **Objectives:** ➢ Identify and understand the role of a lexical and syntax analyzer. ➢ Understand the top-down and bottom-up parsing techniques. 6.1 Top down parser 6.2 Bottom up parser	02	06
	Total	**48**	**100**

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Write a C program for Interchange sort	02
2	Write a C program for Bucket sort	02
3	Write a C program for Radix Interchange sort	02
4	Write a C program for Address calculation sort	02
5	Write a program for generating a symbol table using Lex/Yacc	04
6	Design of Macro assembler	04
7	Design of Loader	04
8	Write a program to read tokens and print its type using Lex	02
9	Write a program for code generation using Lex/Yacc	04
10	Write a program for identifying loop invariant using Lex/Yacc	04
11	Write a lex program to parse input to check it belongs to given syntax of language	02

NOTE: All Practical to be performed on Linux OS using Gcc, Lex and Yacc

Learning Resources:

1. **Books:**

Sr. No.	Author	Title	Publisher
1	John J. Donovan	System Programming	Tata McGraw-Hill Edition
2	D.M. Dhamdhere	System Programming and Operating System	Tata McGraw-Hill Edition
3	G. Sudha Sadashiv	Compiler Design	SciTech
4	Rajesh K. Maurya	System Programming	Dreamtech

2. **CDs, PPTs, code Etc.:**

- www.dreamtechpress.com (PPTs available)
- www.cs.princeton.edu/~appel/modern(for compiler implementation in Java/ML/C)

3. **IS, BIS and International Codes:**

- ISBN: 978-81-7596-071-8
- ISBN: 978-81-317-2950-2
- ISBN: 978-81-775-8555-1
- ISBN: 978-81-203-3051-1

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 : 17625

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	02	100#*	50#	--	50@	200

Rationale:

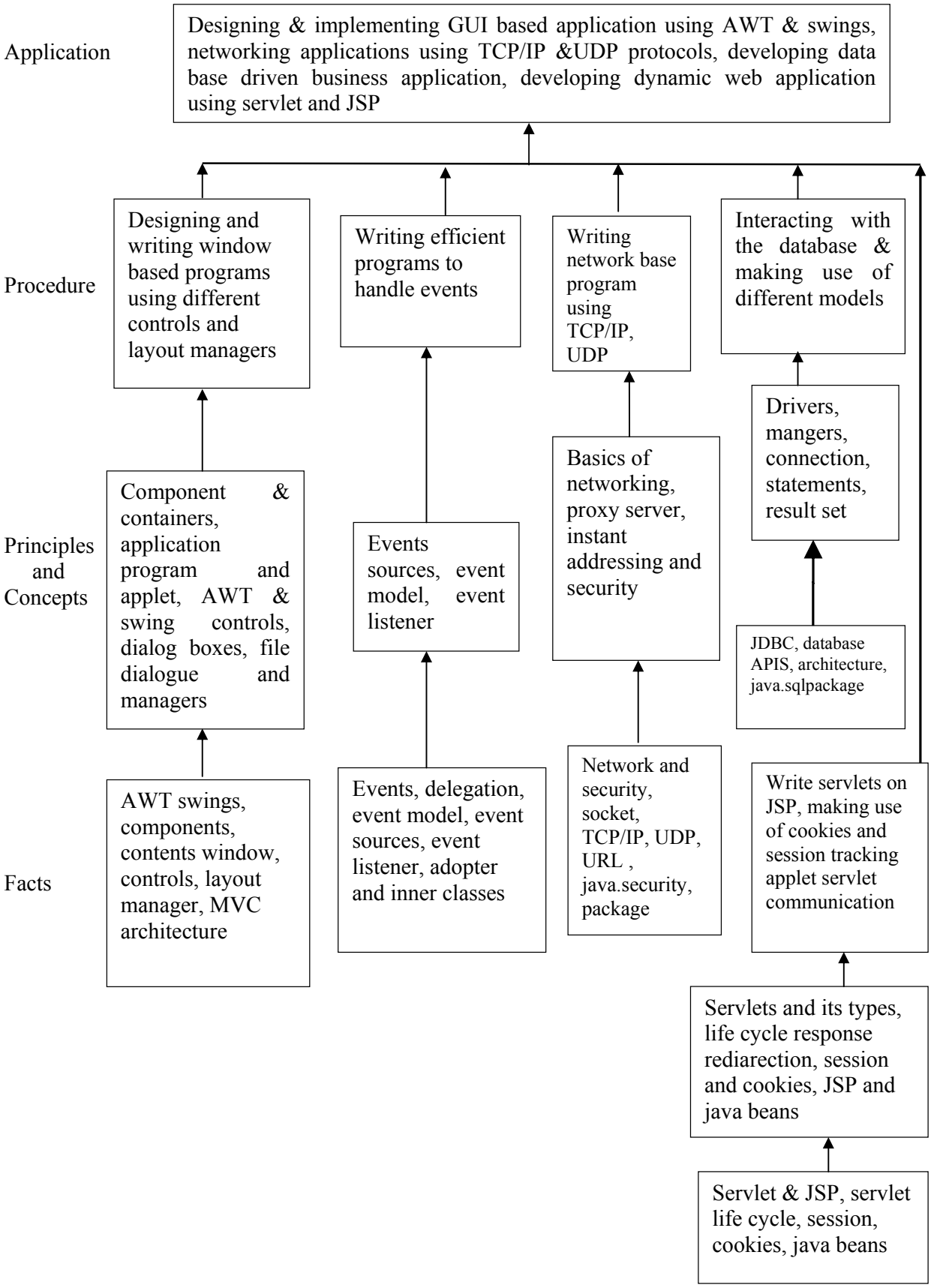
Now days, Internet has touched every aspect of life. If we are not connected to internet, it is like we are nowhere. Online presence is a must for businesses. If your enterprise is not online, you are far behind. Web presence has dominated the businesses worldwide.

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:



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 write programs using 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 write program to demonstrate connectivity through software 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 write servlet for cookies and 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.	2
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.	2
3	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	2
4	Write a program using swing to display a JcomboBox in an applet with the items – cricket, football, hockey, tennis	2
5	Write a program to create a Jtree and recognize mouse clicks on it.	4
6	Write a program to create a JTable On JApplet Window.	4
7	Write a program to display the key pressed on Applet Window.	4
8	Write a program to perform addition of two nos. make use of textfield and button.	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
17	Mini Project	8
	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 : Diploma in Computer Science and Engineering

Course Code : CW

Semester : Sixth

Subject Title : Distributed Operating System (Elective)

Subject Code : 17635

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:

A distributed system over wide area networks allows millions of machine to be connected at gigabyte speeds. Populations all over the world is the users of 'world wide web' the largest Distributed system, ATM's, cloud computing servers, airline reservations are commonly used distributed systems.

The subject covers the principles and paradigm of distributed system and distributed OS, familiarized the students with accessing and sharing remote resources. Distributed OS is a logical aggression of OS software over a collection of independent, networked, communicating and speedily disseminated computational nodes.

Objectives:

The students will be able

1. To understand Hardware and Software structure of Distributed Operating System.
2. To understand concept of protocol and remote execution.
3. To understand concept of processes, threads and code migration.
4. To understand Naming and Location concept in Distributed Computing.
5. To understand Distributed computing architecture like grid, cloud computing.

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Introduction:** **Definition of Distributed System**, **Goals of distributed system,** **Hardware Concepts** - Multiprocessors, Homogenous Multicomputer system, Heterogeneous multicomputer System , **Software Concepts** – Distributed Operating system, Network Operating System, Middleware, **The Client-Server Model**- Clients and Servers, Application layering, Client- Server Architecture	08	16
02	**Communication:** **Layered Protocols**- Low level Protocols, Transport Level Protocols, Higher Level Protocols, **Remote Procedure Call** – Basic RPC operation, Parameter Passing, Extended RPC models Example DCE, RPC, **Remote Object Invocations** Distributed objects, binding a client to object, Static v/s Dynamic Remote invocation, parameter Passing, Example DCE remote object, JAVA RMI, **Message-oriented Communication**- Persistence and synchronicity in communication Message oriented transient communication, Message oriented persistent communication, **Stream Oriented Communication**- Support for Continuous media, Streams and Quality of Service, Stream synchronization.	12	24
03	**Processes:** **Threads** Introduction to threads, Threads in distributed Systems, **Clients** User interfaces, Client-side software for distribution transparency. **Servers** General Design issues, Object Servers **Code Migrations** Approaches to code migration, Migration and local resources, Migration in heterogeneous system. **Software agents** Software agents in Distributed system, Agent Technology.	12	24
04	**Naming:** **Naming entities** names identifiers, addresses, name resolutions implementation of name space, example DNS. **Locating Mobile Entities** naming v/s Locating Entities, Simple Solution, Home based Approaches, Hierarchical Approaches. **Removing Unreferenced Entities** Problem of unreferenced objects, reference counting, Reference listing, Identifying unreachable entities	08	18
05	**Grid Computing and Cloud Computing** **Grid Computing** Concept and Architecture,	08	18

	Cloud Computing evaluation of Cloud, Definition, SPI framework for Cloud computing • SAaS • PAaS • IAas **Cloud Deployment Model** Public, Private, Hybrid **Impact of Cloud Computing On Users** **Governance in the Cloud** **Barriers to Cloud Computers Adoption in Enterprises**		
	Total	**48**	**100**

List of Experiments:

1. To understand concept of three tier client server model in distributed environment
2. To understand Multiprocessor system, Network Operating System
3. To implement program on JAVA RPC.
4. To implement program on JAVA RPI
5. To implement program on threads in distributed system
6. To understand naming entities.
7. To understand architecture of grid computing
8. To understand architecture of cloud computing
9. To understand Cloud model
10. Case study on any Cloud operating environment like Ubuntu one, Microsoft Azure.
    Reference link:
    https://one.ubuntu.com/
    http://www.windowsazure.com/en-us/pricing/free-trial/?WT.mc_id=AzureBg_India_SEM
11. Seminar on relevant topics group of 4 students.
12. Sample Webinar/ Videos from Microsoft, IBM, Ubuntu etc.

Learning Recourses:

1. Books:

Sr. No	Book Title	Author	Publication
1	Distributed Operating System	P.K Sinha	Pearson
2	Distributed Operating System	Tanenbaum	TMG
3	Operating System Concept 7th Edition	Galvin	Wiley

2. Websites:

1. http://www.keithpij.com/Home/tabid/36/EntryID/27/Default.aspx
2. http://www.boic.com/b1mgrid.htm
3. http://www.cl.cam.ac.uk/~rja14/Papers/SE-06.pdf
4. http://www.icloudcompute.com/

3. Magazines:

1. Cloud Computing with the Windows Azure Platform (Author:- Mr. Roger Jennings) Demo lectures with power point presentations using LCD projector should be arranged to develop programming concepts of students.

Course Name : Diploma in Computer Science and Engineering

Course Code : CW

Semester : Sixth

Subject Title : Design and Analysis of Algorithms (Elective)

Subject Code : 17636

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:

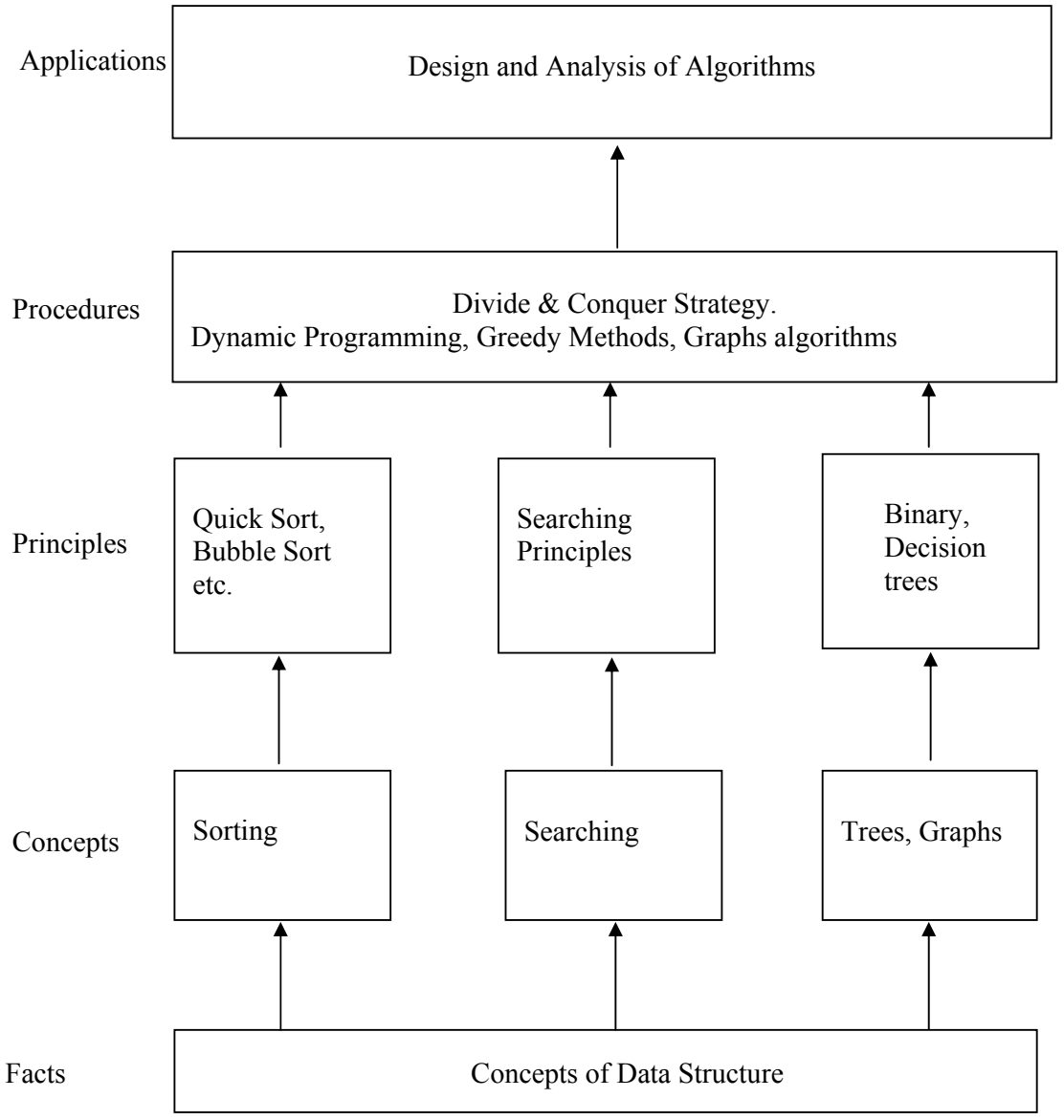
This subject is necessary to understand concept and effective implementation & analysis of different Algorithmic techniques.

Objectives:

Student will be able to:

1) Design algorithms
2) Analyze algorithms
3) Comparison of Algorithms

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Introduction to Algorithms** What is an Algorithm? Fundamentals of Algorithms Sorting, Searching, recursion, Comparison of different algorithms, Objectives of time analysis of algorithms, big-oh and theta	08	20
02	**Sorting and Divide & Conquer strategy,** Merge, Sort, Divide and conquer sort with matrix multiplication, quick sort with average case analysis, Heaps & Heap sort, Lower bound on comparison based sorting and counting sort, radix sort	16	32
03	**Dynamic Programming** Greedy Methods- Knap sack Programming. Job scheduling. Process scheduling with comparison.	08	20
04	**Graph Algorithms** Basic of graph and their representation Breath first search, Depth first search, topological sorting , Minimum Spanning, Krusked Algorithm & Primi Algorithms) Shortest path Algorithms (Dijktra Algorithm), weighted group.	16	28
	Total	**48**	**100**

Practical:

Skills to be developed:

Intellectual Skills:

1. To understand time analysis of algorithms

Motor Skills:

1. Able to design and develop different algorithms

List of Practical: (<u>Practicals shall be conducted in two to three turns of two hours each using any suitable programming language.</u>)

1. Implementation and Time Complexity of Divide and Conquer Techniques.
    - Binary Search
    - Quick Sort
    - Merge Sort
2. Greedy Methods
    - Knapsack Problem
    - Job Scheduling
3. Dijkestra Algorithm
4. Study of Minimum spanning Tree (Kruskal and Prim's Algorith)
5. Comparison of Any two sorting techniques based on Time and iteration count.

Learning Resources:
Books:

Sr. No.	Author	Title	Publication
1	--	Algorithms - Design , analysis and Improvement and applications	Knol Book
2	Horwitz and Sahani	Fundamentals of Computer Algorithms	Galgotia
3	A.V. Aho, J.E. Hopcroft.	Design and analysis of Computer Algorithms.	Addison Westley

Course Name : Computer Engineering Group

Course Code : CO/CD/CM

Semester : Sixth for CO/CM and Seventh for CD

Subject Title : Linux Programming

Subject Code : 17816

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:

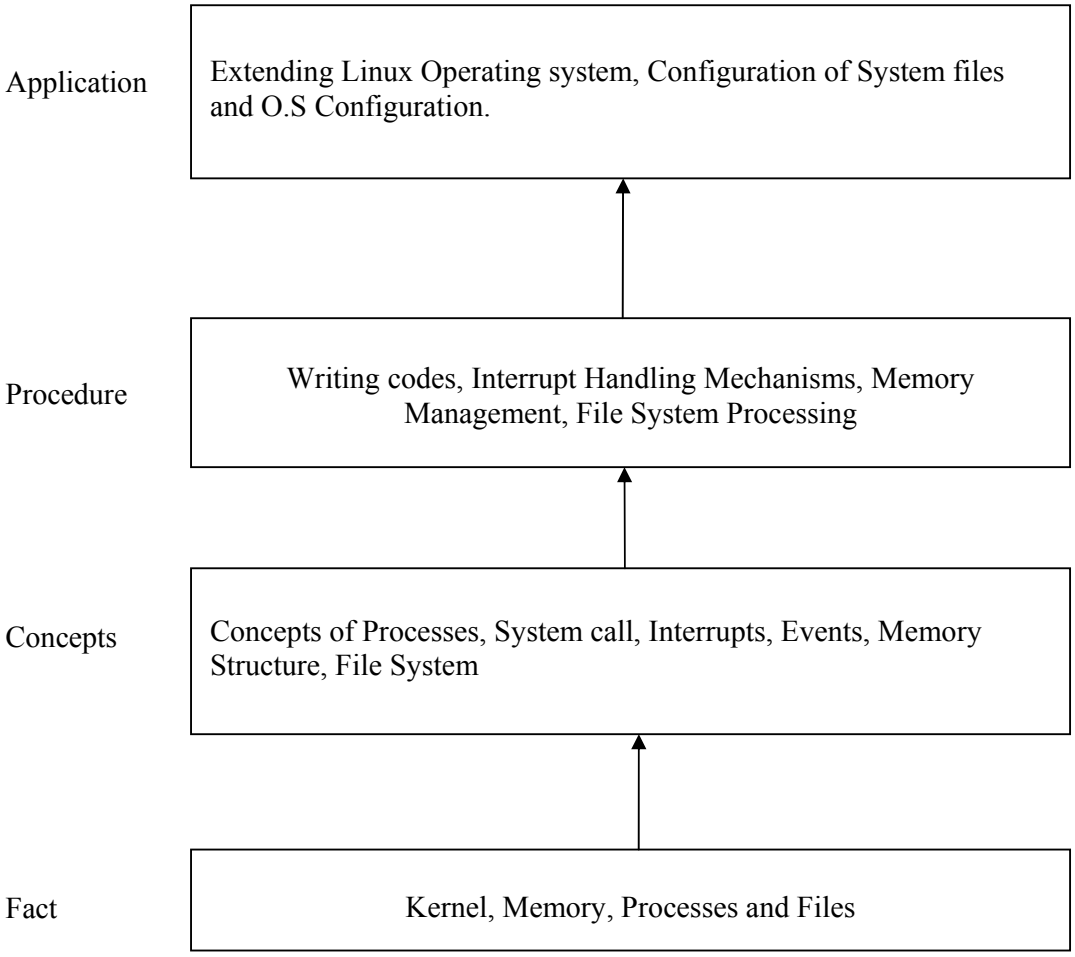
Linux is one of the most successful open source operating system which includes all the features of modern operating systems like virtual memory, virtual file systems, lightweight processes, signals, inter process communications etc. Linux is well supported and demand for Linux programmer is increasing. 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:



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

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 : 17817

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.

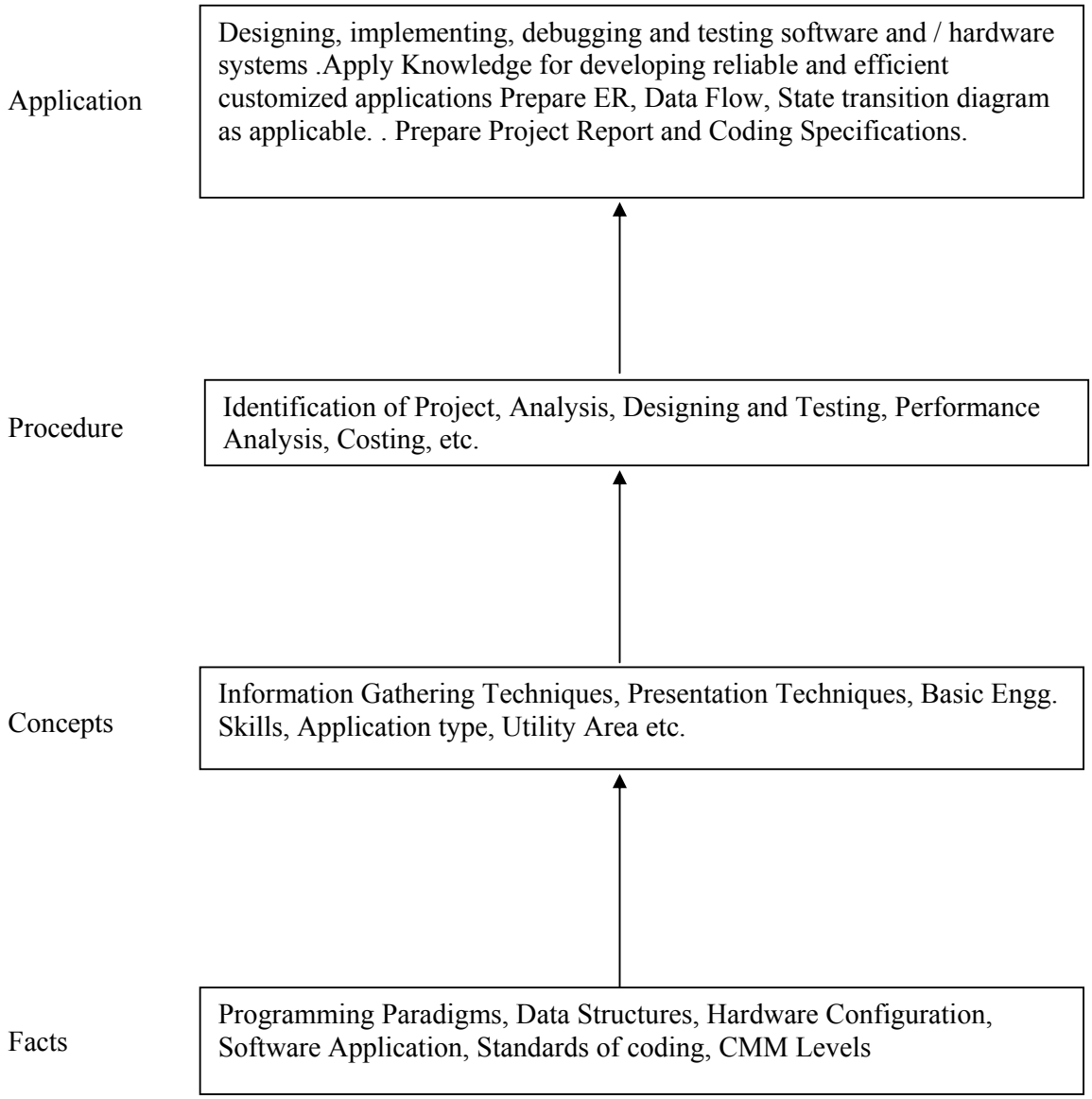
Furthermore the student will be able to find out various sources of technical information and develop self-study techniques to prepare a project and write a project report.

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:



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 : 17818

Teaching and Examination Scheme:

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

Rationale:

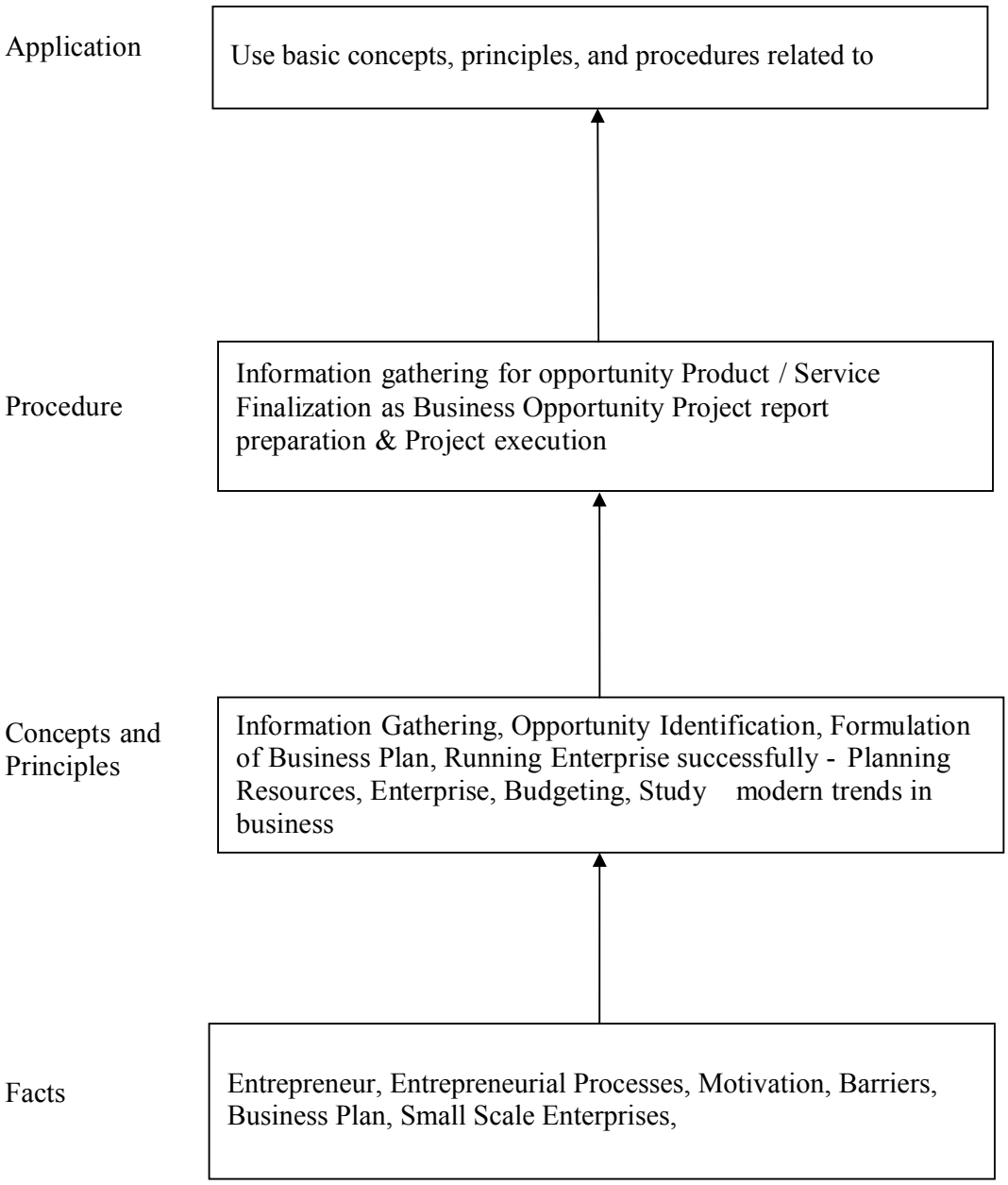
Globalization, liberalization & privatization along with revolution in Information Technology, have thrown up new opportunities that are transforming lives of the masses. Talented and enterprising personalities are exploring such opportunities & translating opportunities into business ventures such as- 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:



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

05	**Business Plan & Project Report** • 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 a 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