

# SOFTWARE ENGINEERING

## (Common with Information Technology)

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### **RATIONALE**

This subject will enable the diploma students to have awareness about software engineering, various metrices, planning about software, cost estimation, software design etc.

### **DETAILED CONTENTS**

1. Introduction to Software (S/W) Engineering (14 hrs)  
Introduction, size factors. Quality and productivity factors. Management issues, models (waterfall, spiral, prototyping), fourth generation techniques, S/W process
2. Planning (8 hrs)  
The development process, an organizational structure, other planning activities
3. Software Cost Estimations (10 hrs)  
Cost factors, cost estimations techniques. Staffing level estimation, estimating software maintenance costs, COCOMO
4. Software Requirements Definition (8 hrs)  
Problem analysis, Requirement engineering. software requirements specifications (SRS), Formal specifications techniques, Characteristics of a good SRS
5. Software Design and Implementation Issue (8 hrs)  
Fundamental design, concept design notations, design techniques, structured coding techniques coding styles, documentation guidelines
6. Verification and Validation Techniques (6 hrs)  
Quality assurance work through and inspections, static analysis, symbolic execution, formal verifications. Testing Techniques- Unit Testing, Alpha testing, Beta testing, Black Box and White Box Testing
7. Maintenance Overview (6 hrs)

## INSTRUCTIONAL STRATEGY

This subject should be taught with reference to the software being developed by various software development companies. This would enable the student to correlate the software engineering concepts to realistic situations

## RECOMMENDED BOOKS

1. Software Engineering Concept by Richard Fairley, Tata McGraw Hill Publishers, New Delhi
2. An Integrated Approach to Software Engineering by Pankaj Jalote, Narosa Publishing House Pvt Ltd, Darya Ganj, New Delhi 110002
3. S/ W Engineering by Rajib Mall, PHI Publishers
4. Software Engineering – A Practitioner's Approach by RS Pressman, Tata McGraw Hill Publishers, New Delhi
5. Software Testing Techniques by B Beizer
6. Software Engineering by KK Aggarwal and Yogesh Singh
7. A Software Engineering Approach by Peter A Darnell, Phillips E, Moglis, Narosa Publishing House Pvt Ltd, Darya Ganj, New Delhi 110002

## SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	14	25
2.	8	10
3.	10	15
4.	8	15
5.	8	12
6.	6	15
7.	6	8
<b>Total</b>	<b>60</b>	<b>100</b>

# COMPUTER GRAPHICS

## (Common with Information Technology)

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### RATIONALE

This subject will enable the students to have awareness about fundamental graphics which can be generated through computers using programming language C. He will be able to make picture and introduce motion in them using basic transformation.

### DETAILED CONTENTS

1. Introduction to Graphic Systems (8 hrs)
 

Display devices, Bit map and vector graphics, resolution, aspect ratio physical input and output devices, display processors, graphics software, coordinate representation, graphics functions and standards.
2. Scan conversion and Output Primitives (14 hrs)
  - Scan converting the point
  - Scan converting the straight line - Bresenham's line algorithm and DDA algorithm
  - Scan converting a circle - Defining a circle
  - Bresenham's circle algorithm and midpoint circle algorithm
  - Region filling - introduction, flood filling, boundary filling
  - Side effects of scan conversion.

Graphic primitives in C, Point plotting, line drawing algorithms – DDA algorithms, Bresenham's line algorithms, circle-generating algorithms, ellipses
3. Two-Dimensional Transformations (12 hrs)
 

Basic transformations-translation, scaling, rotation, matrix representations and homogeneous coordinates, composite transformations, scaling relative to a fixed pivot, rotation about a fixed pivot, general transformation equations, other transformation – reflection and shearing
4. Windowing and Clipping Techniques (12 hrs)
 

Windowing concepts, clipping algorithms, area clipping, line clipping, polygon clipping, text clipping, blanking, window to-view transformation, Cohen Sutherland clipping algorithm.
5. Three Dimensional Graphics (10 hrs)

Three dimensional transformation, wire frame model, hidden line and hidden surface elimination (Z- buffer algorithm)

6. Perspective and Parallel transformations, vanishing points, perspective anomalies (8 hrs)

## **LIST OF PRACTICALS**

Write programs in C for following:

1. To draw a line
2. To move a character about a line
3. To move two characters in. opposite direction.
4. To draw a circle
5. To move a character along circumference
6. To move along radius.
7. To use 2-d translation technique,
8. To use 2-d scaling technique
9. To use 2-d rotation technique.
10. To use 2-d reflection technique

## **INSTRUCTIONAL STRATEGY**

As the subject deals with Core graphics techniques with vast applications in Medical Science, Animation Software, Image Processing, Compression techniques. Teacher is required to expose basic idea of graphics and implementation of various algorithms in C Programming language. The teacher should make the students to write the algorithm first and then based on those algorithms make them implement.

## **RECOMMENDED BOOKS**

1. Principles of Interactive Computer Graphics by WM Newman and RF Spraul
2. Theory and problems of Computer Graphics by Roy A Plastock and Gordon Kalley. McGraw Hill Publishers, Schaum's Outline series.
3. Computer Graphics by Donald Hearn and M Pauline Baker
4. Computer Graphics for Engineers by A Rajaraman, Narosa Publishing House Pvt Ltd Daryaganj, New Delhi 110002

5. Procedural elements for Computer Graphics TMH publication by Rogers

**SUGGESTED DISTRIBUTION OF MARKS**

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1.	8	10
2.	14	25
3.	12	20
4.	12	20
5.	10	15
6.	8	10
<b>Total</b>	<b>64</b>	<b>100</b>

# JAVA PROGRAMMING

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## RATIONALE

Today, the most likely place you will find Java is on World Wide Web. The web acts as convenient transport mechanism for Java programs and the web's ubiquity has popularized Java as an Internet development tool. Java has shifted the programming paradigm of single machine to distributed network of machines. Any application on World Wide Web can be easily implemented. Internet can have numerous applications and various protocols. This course will enable the students to learn in detail network programming language Java.

## DETAILED CONTENTS

1. Introduction to Java (10 hrs)  
A brief history, How Java Works. Java Virtual Machine (JVM), Java in time compiler (JIT), Java features, using Java with other Tools, Native code, Java Application types, comparison with C and C++
2. Working with Data types, Control flow statements, Arrays, command line arguments (6 hrs)
3. Java Classes and Memory Management (10 hrs)  
Introduction to Classes, inheritance, encapsulation and Polymorphism, constructors and Finalizers, Garbage collection, Access specifier
4. Interfaces and Packages (6 hrs)  
Using Java interface, using Java Packages
5. Exception Handling and Stream Files (8 hrs)  
Over view of exception handling, Method to use exception handling, Method available to exceptions (The throw statement, The Throws class, Final class), Creating your own exception classes
6. Threads and Multi-threading (6 hrs)  
Overview, Thread Basics - Creating and running a thread, thread control methods, threads life cycle and synchronization
7. Introduction to Applet, Application and JDK (12 hrs)  
Java Applets Vs Java Applications, Building Application with JDK, Building Applets with JDK, HTML for Java Applets, Managing input-output stream

## 8. Java Data Base Connectivity (JDBC)

(6 hrs)

**LIST OF PRACTICALS**

1. Programming exercise on control flow statements in Java
2. Programming exercise on Arrays and String
3. Programming exercise on inheritance
4. Write Program for exception handling
5. Write programs for Multithreading
6. Programming exercise on Java applets
7. Write program for Java Data base connectivity
8. Mini project on Java

**INSTRUCTIONAL STRATEGY**

The subject deals with object oriented concept. As the subject has both theory and practicals, more stress should be given to practical work.

**RECOMMENDED BOOKS**

1. Java Programming by Balagurusamy
2. Set of Books on Java by Sun Microsystems
3. Java Programming- “How to Program Java” by Dietel and Dietel
4. The Complete Reference Java by Herbel Schildt; McGraw Hill, New Delhi

**SUGGESTED DISTRIBUTION OF MARKS**

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	10	10
2.	6	10
3.	10	15
4.	6	8
5.	8	15
6.	6	10
7.	12	24
8.	6	8
<b>Total</b>	<b>64</b>	<b>100</b>

# E-COMMERCE

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## RATIONALE

“Electronic commerce” or “Doing, business online” is becoming critical in three inter-related dimensions. Customer-to-business interactions, customer-to-customer, intra-business interactions and business-to-business interactions. Electronic Commerce facilitates the network form of organization where small flexible firms rely on other partner companies for component supplies and product distribution to meet changing customer demand more effectively. The transaction management aspect of electronic commerce enables firms to reduce costs by enabling better coordination in sales, production and distribution processes and automated supply chain network. Electronic Data Interchange (EDI), Electronic Mail and Electronic Fund Transfer (EFT), streamline business process, reduces paperwork and increase automation. The course will enable the students to understand e-commerce, its applications, the processes and the security issues.

## DETAILED CONTENTS

### 1. Electronic Commerce Framework (15 hrs)

Defining electronic commerce; technology of digital convergence; convergence of content and transmission types of electronic commerce – inter-organizational E-commerce, EDI over WAN, Extra nets, Electronic Fund Transfer, e-mail, Fax, Intra-organizational e-mail, Types of E-Com-B2B,B2C,C2C

Components of E- commerce

- Institutions- Government, Merchants, Manufacturers, Suppliers, consumers, banks, financial institutions
- Processes-Marketing, Sales, Payments, Fulfillment, Support
- Networks- Corporate, Internet, Commercial

### 2. Architectural Frame Work of E-Commerce (10 hrs)

- Web architecture – web browser, HTTP, TCP/IP, Web server, HTML, CGI Scripts;
- Standards – EDIFACT, EDI

### 3. Security Issues (10 hrs)

Firewalls and proxy application gateways, Secure Electronic Transaction (SET), public and private key encryption, digital signatures and digital certificates, Secure Socket Layer (SSL)



4. Electronic Payment Systems (8 hrs)  
Digital cash, electronic signatures, Debit cards at Point of Sale (POS), Smart Cards, Online Credit Card based Systems, Electronic Fund Transfer (EFT), Payment gateways
5. Electronic Commerce Applications (8 hrs)  
E-Commerce Banking, Online shopping, Business Models and Revenue Models, On-line publishing, E-commerce in retailing industry, Digital Copyrights, Electronic Data Interchange, Electronic Fund Transfer, Electronic Bulletin Boards, Electronic Catalogue
6. Legal and Social Issues (4 hrs)
7. Tools for e-commerce: Cold fusion, e-shop etc. (4 hrs)
9. E-Governance, issues, latest scenario of e-commerce in India, resources required for implementing an E-Governance project, guidelines etc. (5 hrs)

### **INSTRUCTIONAL STRATEGY**

The teacher should take the help of inter-net and latest trends to teach this subject effectively. Every topic should be completed with suitable examples and case studies

### **RECOMMENDED BOOKS**

1. Electronic Commerce – A Manager’s Guide by Ravi Kalakota and Andrew B. Whinston; Addison Wesley (Singapore) Pvt Ltd, New Delhi
2. “E-Business – Roadmap for Success” by Ravi Kalakota and Maxia Robinson; Addison Wesley (Singapore) Pvt Ltd, New Delhi
3. E-Business (R) Evolution by Amor; Addison Wesley (Singapore) Pvt Ltd, New Delhi
4. Ontiers of Electronic Commerce by Ravi Kalakota and Andrew B. Whinston; Addison Wesley (Singapore) Pvt Ltd, New Delhi
5. E-Business with Net Commerce (with CD) by Shurety; Addison Wesley (Singapore) Pvt Ltd, New Delhi

**SUGGESTED DISTRIBUTION OF MARKS**

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1.	15	20
2.	10	15
3.	10	15
4.	15	15
5.	15	15
6.	4	5
7.	4	5
8.	5	10
<b>Total</b>	<b>78</b>	<b>100</b>

## Elective-II

### MOBILE COMMUNICATION

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#### RATIONALE

Wireless Communication course is intended to provide exposure and awareness of latest wireless communication technologies. This course is designed in conjunction with course “Computer Networks” which provide concepts of networks.

#### DETAILED CONTENTS

1. Introduction (16 hrs)  
  
Evolution of Mobile Communication Systems, Paging systems, cordless telephone system, cellular telephone system, comparison of common wireless communication system, 2G cellular networks, 2.5G wireless network, HSCSD, GPRS, EDGE technology, 3G wireless network, UMTS, 3G CDMA2000, 3G TD-SCDMA, wireless local loop, blue tooth and personal area networks.
2. System Design Fundamentals (12 hrs)  
  
Frequency reuse, channel alignment strategies, handoff strategies, interference and system capacity, improving coverage and capacity in cellular systems, parameters for mobile multipath channel, small scale fading,
3. Modulation Techniques (16 hrs)  
  
Amplitude modulation, angle modulation, digital modulation, linear modulation techniques, constant envelope modulation, spread spectrum modulation techniques, equalization, equalizers in communication receiver, diversity techniques, RAKE receiver, fundamentals of channel coding.
4. Multiple Access Techniques (6 hrs)  
  
FDMA. TDMA, CDMA, SDMA
5. Wireless Networking (6 hrs)  
  
Difference between wireless and fixed telephone networks, development of wireless networks, ISDN
6. Wireless Systems (8 hrs)

GMS, GSM architecture, CDMA digital cellular standard, IS-95 system, IEEE 802.11b, 802.11G, blue tooth and RF

### **INSTRUCTIONAL STRATEGY**

Explanation of concepts using real-time examples/case studies.

### **RECOMMENDED BOOKS**

1. Wireless Communication Principles and Practice by Theodore S. Rappaport, Prentice Hall India, Edi 2<sup>nd</sup>.
2. Modern Wireless Communication by Simon Haykin, Michael Moher, Prentice Hall of India, Edi. 1<sup>st</sup>.
3. Wireless Communication and Networking by Jon W Mark, Prentice Hall of India, Edi 1<sup>st</sup>.

### **SUGGESTED DISTRIBUTION OF MARKS**

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1.	16	20
2.	12	15
3.	16	20
4.	6	15
5.	6	15
6.	8	15
<b>Total</b>	<b>64</b>	<b>100</b>

# NETWORK SECURITY

## (Common with Information Technology)

L T P  
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### RATIONALE

This course has been designed by keeping in view the basic computer users and information system managers. The concepts are needed to understand risks and how to deal with them. It is hoped that the student will have a wider perspective on security in general and better understanding of how to reduce and manage the security risks.

### DETAILED CONTENTS

1. Introduction (4 hrs)  
Why Secure Network – Attackers Vs Hackers; attack from within and external
2. How Much Security (6 hrs)  
Promoting Risk analysis; developing security policy – accessibility, defining security goals, justifying the policy, roles and responsibility, consequences of non-compliance, level of privacy
3. Firewalls (6 hrs)  
Defining and access control policy, definition of firewalls and types, address translation, firewall logging, firewall deployment
4. Intrusion Detection System (IDS) (6 hrs)  
IDS introduction; IDS limitations – counter measures; Host based IDS set up
5. Authentication and Encryption (12 hrs)  
Authentication: Clear text transmission, session tracking; Encryption – methods, weaknesses, government interaction; Solutions – data encryption standards, digital certificate servers, IP security, Point to Point Tunneling Protocol (PPTP), RSA

encryption, Secure Socket Layer (SSL), secure shell, Simple Key Management for IP (SKIP)

6. Virtual Private Network (VPN) (10 hrs)

Basics, setting of VPN - VPN diagram, configuration of required objects, exchanging keys, modifying security policy

7. Virus, Trojans and Worms (10 hrs)

What is Virus: replication, concealment, bomb, social engineering viruses; Worms; Trojan Horses; Preventive measures – Access Control, checksum verification, process neutering, virus scanners, heuristic scanners, application level virus scanners, deploying virus protection.

8. Disaster, Prevention and Recovery (10 hrs)

Disaster categories; network disasters – cabling, topology, single point of failure, save configuration files; server disasters – UPS, RAID, Clustering, Backups, server recovery, reluctant servers

## **INSTRUCTIONAL STRATEGY**

Since the facilities are not available in the polytechnic, students need exposure to various security systems and software available in some organisations, universities and engineering colleges. For this, visits may be organised for students. The teachers should also be exposed in this area. Some practicals can be conducted in the laboratory.

## **RECOMMENDED BOOKS**

1. Mastering Network Security by Christ Breton; BPB Publication, New Delhi
2. Web-sites by Chris Breton, BPB Publication, New Delhi
3. Network Firewalls by Kiranjeet Syan; New Rider Publication
4. Internet Security, New Rider Publication

**SUGGESTED DISTRIBUTION OF MARKS**

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1.	4	8
2.	6	10
3.	6	12
4.	6	10
5.	12	20
6.	10	15
7.	10	15
8.	10	10
<b>Total</b>	<b>64</b>	<b>100</b>

# INTERNET AND WEB DESIGNING

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2 - 4

## RATIONALE

This course will enable the students to understand the basics of internet and various application of internet like e-mail, FTP, Telnet, Newsgroups and video conferencing. In addition, this course develops competency amongst the students to design professional web sites and interactive web pages. They will have overview of different technologies like HTML, DHTML, XML, CGI, ASP, JSP, Java Script, VB Script.

## DETAILED CONTENTS

1. Internet Basics (4 hrs)  
 Concept of internet and its evolution, Application and use of internet in various fields of Science and Technology, Specification and technical details for establishing Internet.  
 Types and functions of modems, IP addressing, internet domains, domain name server, TCP/IP protocols, Internet service providers, Intranets
2. Internet Connectivity media (2 hrs)  
 Telephone line, cable, leased line, ISDN, VSAT, RF link
3. World Wide Web (WWW): (2 hrs)  
 World Wide Web and its evolution, web system architecture, web page, web server, HTTP protocol, search engines. Examples of web servers and cookies.  
 Navigation Tools: Netscape and Internet Explorer, Uniform Resource Locator (URL)
4. Internet Applications: (4 hrs)  
 E-mail; SMTP, POP3, Telnet, FTP, IRC, Video conferencing, e-commerce
5. HTML (3 hrs)  
 Basic structure of HTML, designing a web page, basic text formatting, links, images, , fonts, sizes, simple tables and forms.  
 HTML tags, hyperlinks. Hypertext, adding graphics and images, image maps, image files, tables, forms, cascading style sheets and frames



6. Using Front Page (2 hrs)  
Front page editor
7. Client-side Scripting: VB Scripting, Java Script, (3 hrs)
8. Introduction to Java Script, event handling, verifying forms, working with browser windows, embedding with HTML (3 hrs)
9. Service Scripting: Scripting method (3 hrs)
10. Introduction to (3 hrs)
  - Java Server Pages (JSP)
  - Active Server Pages (ASP)
  - Common Gateway Interface (CGI)
  - PHP
11. Developing Interactive Web Pages using Java Scrip / VB Script / ASP / JSP / CGI / PHP (3 hrs)

### **LIST OF PRACTICALS**

1. Configuring computer system to access internet
2. Using e-mail
3. Using WWW for accessing relevant information
4. Using Telnet
5. Using FTP
6. Using IRC
7. Creating Web pages using HTML
8. Creating web pages using front page
9. Design of Forms using Java Script or Visual Basic Script
10. Validation of user queries and responses in the Forms using Java Script or VB script
11. Create a Homepage with frames, animation, background sound and hyperlinks

12. Designing simple server side program which accepts some request from the client and respond
13. Establishing sessions between servers and clients
14. Design fill-out form with text, check box, radio buttons etc and embed Java script or VB script to validate users input.
15. Develop simple server side program in ASP (Active server pages) which accepts some request from the client and respond.
16. Develop interface with database (MS-Access etc) for online retrieval and storage of data through HTML form.

### **INSTRUCTIONAL STRATEGY**

Since the subject is practice-oriented, theoretical instructions may be also given during practical sessions. The detailed contents have been given to have an idea about the exercises to be done in the practical classes. Since this subject is practice-oriented, theoretical instructions may be given during the practical sessions/class. The detailed contents have been given to have an idea about the exercises to be done in practical class.

The theory classes must be taken with Practical examples.

### **RECOMMENDED BOOKS**

1. Internet 6-in-1 by Kraynak and Habraken, Prentice Hall of India Pvt. Ltd., New Delhi
2. Using the Internet IV edition by Kasser, Prentice Hall of India Pvt. Ltd., New Delhi
3. Using the World Wide Web, (IInd edition) by Wall, Prentice Hall of India Pvt. Ltd., New Delhi
4. HTML – 4 for World Wide Web by Castro Addison Wesley (Singapore) Pvt. Ltd., New Delhi
5. Teach Yourself HTML 4.0 with XML, DHTML and Java Script by Stephanie, Cottrell, Bryant; IDG Books India Pvt. Ltd., New Delhi
6. Using Active Server Pages by Johnson et.al. Prentice Hall of India, New Delhi
7. Java Server Pages (JSP) by Pekowsky Addison Wesley (Singapore) Pvt. Ltd., New Delhi

8. Active Server Pages (ASP) by Keith Morneau Jill Batistick Web Warrior Series  
Available with Vikas Publishing House Pvt. Ltd., New Delhi
9. Java Script in 24 hrs Tech Media Publications

### SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	4	15
2.	2	5
3.	2	5
4.	4	15
5.	3	10
6.	2	5
7.	3	10
8.	3	10
9.	3	7
10.	3	8
11	3	10
<b>Total</b>	<b>32</b>	<b>100</b>

# MAJOR PROJECT WORK

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## RATIONALE

Major Project Work aims at developing innovative skills in the students whereby they apply in totality the knowledge and skills gained through the course work in the solution of particular problem or by undertaking a project. The individual students have different aptitudes and strengths. Project work, therefore, should match the strengths of students. For this purpose, students should be asked to identify the type of project work, they would like to execute. It is also essential that the faculty of the respective department may have a brainstorming to identify suitable project assignments for their students. The project assignment can be individual assignment or a group assignment. There should not be more than 3 students if the project work is given to a group. The students should identify themselves or accept the given project assignment at least two to three months in advance. The project work identified in collaboration with industry should be preferred. Each teacher is expected to guide the project work of 5–6 students.

The project assignments may consist of:

- Installation of computer systems, peripherals and software
- Programming customer based applications
- Web page designing including database connectivity
- Database applications
- Networking
- Software Development
- Web Page Designing
- Fabrication of components/equipment (computer related components)
- Fault-diagnosis and rectification of computer systems and peripherals
- Bringing improvements in the existing systems/equipment
- Projects related to Multimedia
- Projects related to Computer Graphics
- Project related to various types of viruses, their cause, and preventive measures

- Project assignment related to DBMS using Oracle 8i/9i
- Designing of data bases for small business establishments, like private hospitals, warehouses, super stockists etc.

A suggestive criteria for assessing student performance by the external (personnel from industry) and internal (teacher) examiner is given in table below:

Sr. No.	Performance criteria	Max.* marks	Rating Scale				
			Excellent	Very Good	Good	Fair	Poor
1.	Selection of project assignment	10	10	8	6	4	2
2.	Planning and execution of considerations	10	10	8	6	4	2
3.	Quality of performance	15	20	16	12	8	4
4.	Providing solution of the problems or production of final product	15	15	14	10	-	4
5.	Sense of responsibility	10	10	8	6	4	2
6.	Self expression/ communication skills	5	5	4	3	2	1
7.	Interpersonal skills/human relations	5	5	4	3	2	1
8.	Report writing skills	15	10	8	6	4	2
9.	Viva voce	15	10	8	6	4	2
<b>Total marks</b>		<b>100</b>	<b>100</b>	<b>80</b>	<b>60</b>	<b>40</b>	<b>20</b>

The overall grading of the practical training shall be made as per following table

	Range of maximum marks	Overall grade
i)	More than 80	Excellent
ii)	79 > 65	Very good
iii)	64 > 50	Good
iv)	49 > 40	Fair
v)	Less than 40	Poor

In order to qualify for the diploma, students must get “Overall Good grade” failing which the students may be given one more chance of undergoing 8 -10 weeks of project oriented professional training in the same industry and re-evaluated before being disqualified and declared “not eligible to receive diploma”. It is also important to note that the students

must get more than six “goods” or above “good” grade in different performance criteria items in order to get “Overall Good” grade.

### **Important Notes**

- 1. This criteria must be followed by the internal and external examiner and they should see the daily, weekly and monthly reports while awarding marks as per the above criteria.**
- 2. The criteria for evaluation of the students have been worked out for 100 maximum marks. The internal and external examiners will evaluate students separately and give marks as per the study and evaluation scheme of examination.**
- 3. The external examiner, preferably, a person from industry/organization, who has been associated with the project-oriented professional training of the students, should evaluate the students performance as per the above criteria.**
- 4. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific nearby industries are approached for instituting such awards.**

The teachers are free to evolve another criteria of assessment, depending upon the type of project work.

The students must submit a project report of not less than 50 pages ( excluding coding). The report must follow the steps of Software Engineering Concepts

It is proposed that the institute may organize an annual exhibition of the project work done by the students and invite leading Industrial organisations in such an exhibition. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific industries are approached for instituting such awards.

## GENERIC SKILL DEVELOPMENT CAMP – II

As per general feedback received from the employers regarding Technician Engineers during formal interactions, the pass outs of polytechnics are labeled of falling short of employable skills which comprises of Communication, inter-personal relationship, leadership qualities, team work, problem solving, managing task, managing self etc. in addition to technical knowledge and skills. We have, therefore, added papers such as English and Communication Skills and Entrepreneurship Development and Management in the curriculum in addition to proposed camps of 3-4 days to be conducted in polytechnics on common and vital issues e.g. Environmental Awareness, Entrepreneurship Development and Generic Skill Development.

It is proposed that a camp of 3-4 days duration on Generic Skills Development (GSD) during 6<sup>th</sup> semester be organized by arranging expert lectures/discussion sessions either by polytechnic teachers or by eminent educationists from the neighborhood to deal with the following topics. Few students may also be encouraged to prepare on some of these topics and make presentation during the camp. Expert lectures must be followed by distribution of relevant handouts for further study. The attendance of students should be compulsory and marks be awarded under provision of Student Centred Activities.

It is envisaged that such camps will bring in a significant improvement in confidence level and personality of the pass outs from polytechnics.

Suggested list of topics for arranging lectures/discussion sessions:

1. Ethics and Values
  - 1.1 Introduction and importance
  - 1.2 Ethics and values in profession and society
  - 1.3 Dignity of labour
  - 1.4 Net etiquettes
2. Group Dynamics
  - 2.1 Introduction
  - 2.2 Leadership
  - 2.3 Communication in group
  - 2.4 Team work
3. Personality Development
  - 3.1 PR technique
  - 3.2 Positive attitude
  - 3.3 Self-esteem
  - 3.4 Creativity
4. SWOT Analysis
  - 4.1 Importance
  - 4.2 Introduction to SWOT analysis steps
  - 4.3 SWOT analysis parameters