6.1 OBJECT ORIENTED PROGRAMMING USING JAVA

L T P
Periods/Week 4 - 3

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   (08 Periods)
    A brief history, how Java works?, Java Virtual Machine (JVM), Java In Time (JIT) compiler, 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, casting, command line arguments
                                                                         (10 Periods)

3. Java Classes and Memory Management   (08 Periods)
    Introduction to Classes, inheritance, encapsulation and polymorphism, constructors and finalizers, garbage collection, access specifier

4. Interfaces and Packages   (08 Periods)
    Using Java interface, using Java packages

5. Exception Handling and Stream Files   (08 Periods)
    Over view of exception handling, method to use exception handling, method available to exceptions (The throw statement, the throws class, finally class), creating your own exception classes

6. Threads and Multi-threading   (08 Periods)
    Overview, thread basics – creating and running a thread, The thread control methods, The threads life cycle and synchronization

7. Introduction to Applet, Application and JD   (08 Periods)
    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)   (06 Periods

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.   The Complete Reference Java by Herbel Schildt; McGraw Hill, New Delhi

2.   Java Programming by Balagurusamy, Tata McGraw Hill Education Pvt Ltd , New Delhi

3.   Computer Programming in Java, W C/D by Junaid Khateeb, Wiley-India Pvt Ltd. Daryaganj, New Delhi

4.   The Complete Reference by Patrick Naughton, Tata McGraw Hill Education Pvt Ltd , New Delhi

5.   Set of Books on Java by Sun Microsystems

6.   Java 2 Programming Bible by Aaron Walsh, Justin Couch, Daniel Steinberg, IDG Books India Pvt. Ltd., Netaji Subhash Marg, Darya Ganj, New Delhi

7.   Java Pogramming- "How to Program Java" by Dietal and Dietel

8.   An Introduction to Java Programming by Y Daniel Liang; Prentice Hall of India

9.   Core Java by Cay S Horseman and Lray Carnell.

10. Introduction to Cryptography with applets by David Bishop, Narosa Publishing House Pvt Ltd, Darya Ganj, New Delhi

11. OOPS Using Java by Thampi; Dream Tech. Press.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	08	12
2	10	16
3	08	12
4	08	12
5	08	12
6	08	12
7	08	12
8	06	12
Total	**64**	**100**

6.2   COMPUTER GRAPHICS

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.   Graphic Systems   (06 Periods)
      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 Periods)
      Scan converting the point, Scan converting the straight line - Bresenham's line algorithm, Scan converting a circle - Defining a circle, Bresenham's 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

3.   Two-Dimensional Transformations   (14 Periods)
      Basic   transformations-translation,   scaling,   rotation,   matrix   representations   and homogeneous coordinates, composite transformations – scaling relative to a fixed pivot, rotation about a fixed pivot point, general transformation equations, other transformation – reflection and shearing.

4.   Windowing and Clipping Techniques   (10 Periods)
      Windowing concepts, clipping algorithms, area clipping, line clipping, polygon clippings, text clipping, blanking, window to-viewpoint transformation, Cohen Sutherland clipping algorithm.

5.   Three Dimensional Graphics   (12 Periods)
      Three dimensional transformation, wire frame model, hidden line and hidden surface elimination (z-buffer algorithm), curve fitting and tracing

6.   Perspective and Transformations   (08 Periods)
      Perspective and Parallel transformations, vanishing points, perspective anomalies

LIST OF PRACTICALS
Write programs 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 & 3-D translation technique,
8.   To use 2-D & 3-D scaling technique
9.   To use 2-D & 3-D rotation technique.
10.   To use 2-D & 3-D reflection technique

INSTRUCTIONAL STRATEGY

As the subject deals with Core Graphics Packages and 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. Computer Graphics with Virtual Reality Systems by Rajesh K. Maurya, Wiley India Pvt Ltd. Daryaganj, New Delhi

2. Computer Graphics by Donald Hearn and M Pauline Baker

3. Theory and problems of Computer Graphics by Roy A Plastock and Gordon Kalley. McGraw Hill

4. Publishers, Schaum's Outline series.

5. Interactive Computer Graphics by Harengton

6. Computer Graphics Programming Approach by Steven Harrington

7. Principles of Interactive Computer Graphics by WM Newman and RF Spraull

8. Computer Graphics for Engineers by A Rajaraman, Narosa Publishing House Pvt Ltd Daryaganj, New Delhi 110002

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	06	12
2	14	25
3	14	18
4	10	18
5	12	15
6	08	12
Total	**64**	**100**

6.3   DATA WAREHOUSE AND MINING

L T P
Periods/Week 4 -   -

RATIONALE

Data Mining and Warehousing enables middle and top managers to analyze data and explore relationships among the data items which helps them to take right decisions in right time. After going through this course, students can understand the concepts, functions and various techniques of data mining and warehousing and appreciate them through various case studies.

DETAILED CONTENTS

1.   Introduction to Data Mining   (08 Periods)
   - What is data mining? Data mining background
   - Inductive learning, statistics, machine learning
   - Difference between data mining and machine learning, data mining models, verification model, discovery model
   - Data mining problems/issues

2.   Introduction to Data Warehousing   (15 Periods)

   - Concept and benefits of data warehousing, type of data, characteristics of a data warehouse, processes in data warehousing
   - Data warehousing and OLTP systems
   - The data warehouse architecture, problems with data warehousing, criteria for a data warehouse
   - Data marks

3.   Data Mining Functions   (15 Periods)
   - Classification
   - Associations
   - Sequential/temporal patterns
   - Clustering/segmentation

4.   Data Mining Techniques   (20 Periods)
   - Cluster analysis
   - Induction, decision trees, rule induction
   - Neural networks
   - On-line analytical processing, OLAP (Online Analytical Processing) examples
   - Comparison of OLAP and OLTP (Online Transaction Processing)
   - Data visualization

5.   Case Studies on Data Mining Applications and recent trends in data mining

(06 Periods)

INSTRUCTIONAL STRATEGY

As the subject is theoretical one, the concepts of data warehousing and data mining and their

applications must be introduced to students with appropriate case studies and examples

RECOMMENDED BOOKS

1. Data Mining Concepts and Techniques by J. Han, M Kamber, Morgan Kaufmann, 2001, ISBN 1-55860-489-8

2. Introduction to Data Mining by Hand, Mannila, and Smyth, MIT Press, Cambrdge, MA, 2000

3. OLAP Solutions: Building Multidimensional Information Systems by Erik Thomsen, John Wiley & Sons, Inc., 1997 (ISBN 0471014931-4)

4. Data Warehousing for IT Professionals by Poonia; Wiley India Publications

5. Data Mining Techniques by Linos; Wiley India Publications.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	08	15
2	15	25
3	15	20
4	20	25
5	06	15
Total	**64**	**100**

6.4   OPEN SOURCE TECHNOLOGIES

L T P
Periods/Week   4 – 3

RATIOANLE

This course is aimed at providing the students with a fairly good knowledge and understanding of Open Source Software. After completion of this subject students will be able to use copyright free Open Source Software products in research and collaborate in enhancement of these OSS products.

DETAILED CONTENTS

1.   Introduction   (06 Periods)

Open Source Origins, Differences among Open Source, freeware, proprietary and other software. Principle and Techniques of Open Source Development, Issues in Open Source Software Development.

2.   Legal Issues   (06 Periods)

Copyright and IPR, Open Source Licenses, Open Standards

3.   Open Source Operating Systems   (18 Periods)

Linux's History and flavors, Installation of Libux: File system of linux, Network & packages Configuration, LILO, GRUB, Linux's fdisk. Overview of Linux structure, general purpose Linux commands; working with editor. Introduction to Open Office, Introduction to C/C++ programming in Linux environment, shell programming, Installation of Linux server

4.   Internet-The Technology   (06 Periods)

Open standards, W3C Protocols, Role of XML in Open Source Software Development.

5.   Open Source Database   (10 Periods)

Introduction to MySQL, Database design and development using MySQL

6.   Open Source Web Development Tools   (12 Periods)

PHP syntax (variables, control structures, functions), File Handling: Uploading files, Using PHP to open read, write and close external files and manipulate data. Security: Avoiding security pitfalls by careful coding.

7.   Case studies related to successful implementation of open source software.   (06Periods)
C/C++,PHPMySQL, Java, Linux, LaTeX, Python, Scilab, Blender, GIMP, Open FOAM, Oscad ,Q-CAD, firefox etc.

LIST OF PRACTICALS

1. To install linux/Fedora/ ubuntu and understand its file system i.e. ext2, ext3.
2. To configure LINUX OS using LILO, Grub.
3. Introduction of LINUX shell-(Korn, Bourne, C Shell) and using shell commands.
4. To use XML and prepare database in XML.
5. To use MySQL and create tables in MySQL.
6. To prepare Web page using PHP.
7. To prepare Web forms using PHP and store database in MySQL.
8. To install, use open office and compare its features with MS Office.

INSTRUCTIONAL STRATEGY

Since Open Source Software has wider scope, thus open source software lab need to be established and more practicals and exposures can be conducted through case studies and industrial visits.

RECOMMENDED BOOKS

1. Beginning PHP5, Apache, MySL, Web Dvelopment by Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Michael K. Glass; Wiley Publishing Inc.
2. Open Source SOA by Jeff Davis, Wiley-India Pvt Ltd. Daryaganj, New Delhi.
3. Unix for Programmers and Users by Graham Glass, King Ablas; Pearson Education

Internet sites:

1. www.opensource.org
2. www.w3.org
3. www.spoken-tutorial.org
4. www.fosscommunity.wordpress.org
5. www.sf.net
6. www.githeeb.org
7. www.yolinux.org
8. www.disfrowatch.com

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	06	10
2	06	10
3	18	30
4	06	12
5	10	12
6	12	16
7	06	10
Total	**64**	**100**

6.5   MOBILE COMPUTING

RATIONALE

The ubiquity of wireless communication technologies and the proliferation of portable computing devices have made possible a mobile computing era in which users, on the move, can seamlessly access network services and resources, from anywhere and at anytime. This course provides an introduction to the fundamentals of mobile computing. A background in computer networks and wireless communication is required.

DETAILED CONTENTS

1.   Introduction   (08 Periods)

Evolution of wireless networks, wireline and wireless data networks, advantages of mobile computing, networks, middleware and gateways, application, services and security, Evolution of mobile communication system, paging system

2.   Mobile Computing Architecture   (10 Periods)

3-tier architecture, design considerations for mobile computing, mobile computing through internet, FDMA, TDMA, CDMA, SDMA

3.   Cellular Networks   (10 Periods)

GSM principles and architecture, GPRS architecture, EDGE, 2G cellular network, 2.5 G wireless network, HSCSD,UMTS, 3G, CDMA Technologies

4.   System design fundamentals   (10 Periods)

Frequency reuse, channel alignment strategies, handoff strategies, interference and system capacity, improving converge and capacity in cellular system, parameters for mobile multipath channel, small scale fading

5.   Wireless System and Standards   (15 Periods)

Difference between wireless and wired telephone network, ISDN, development of wireless network, Bluetooth, RFID, IEEE 802.11.a/b/g/n, Mobile IP, IPV6, JAVA Card, Features of WIMAX,CDMA digital cellular standard

6.   Wireless Application Protocol (WAP)   (06 Periods)
WAP, MMS, GPRS Applications

7. Operating Systems for Mobile Devices   (05 Periods)
Design constraints in applications for handheld devices, palm and symbian OS features and architecture, introduction to J2ME technology, Android OS

INSTRUCTIONAL STRATEGY
Since the subject is comparatively new and the students are required some background of other subjects like computer networks and wireless communication. So while explaining of concepts, real-time examples and case studies may be used. In addition, institute may arrange visits to places

RECOMMENDED BOOKS

1.   Mobile Computing: Technology, Applications and Service Creation by Asoke K. Talukdar and Roopa R. Yavagal, Tata McGraw Hill Education Pvt Ltd , New Delhi

2.   Handbook of Wireless Networks and Mobile Computing by Stojmenovic, Wiley India Pvt Ltd. Daryaganj, New Delhi

3.   Wireless Communication: Principles and Practice by Theodok S. Rappaport, Pearson Education Asia, 2nd Edition.

4.   Principles of Mobile Computing by Owe Hansman, Lothar Merk, Martin S Nicklous and Thomas Stober, Springel-Verlag, 2nd Edition, 2003, New Delhi

5.   Mobile Computing by Hansman; Wiley India Publications.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	08	12
2	10	15
3	10	15
4	10	15
5	15	25
6	06	10
7	05	08
Total	**64**	**100**

6.6   ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT

L T P
Periods/Week 5 - -

RATIONALE

In the present day scenario, it has become imperative to impart entrepreneurship and management concepts to students so that a significant percentage of them can be directed towards setting up and managing their own small enterprises. This subject focuses on imparting the necessary competencies and skills of enterprise set up and its management.

DETAILED CONTENTS

SECTION – A   ENTREPRENEURSHIP

1.   Introduction   (23 periods)

- Concept /Meaning and its need
- Qualities and functions of entrepreneur and barriers in entrepreneurship
- Sole proprietorship and partnership forms of business organisations
- Schemes of assistance by entrepreneurial support agencies at National, State, District level: NSIC, NRDC, DC:MSME, SIDBI, NABARD, Commercial Banks, SFC's TCO, KVIB, DIC, Technology Business Incubator (TBI) and Science and Technology Entrepreneur Parks (STEP)

2.   Market Survey and Opportunity Identification   (17 periods)

- Scanning of business environment
- Salient features of National and State industrial policies and resultant business opportunities
- Types and conduct of market survey
- Assessment of demand and supply in potential areas of growth
- Identifying business opportunity
- Considerations in product selection

3.   Project report Preparation   (14 periods)

- Preliminary project report
- Detailed project report including technical, economic and market feasibility
- Common errors in project report preparations
- Exercises on preparation of project report

SECTION –B   MANAGEMENT

4.   Introduction to Management   (06 periods)

- Definitions and importance of management
- Functions of management: Importance and Process of planning, organising, staffing, directing and controlling
- Principles of management (Henri Fayol, F.W. Taylor)
- Concept and structure of an organisation
- Types of industrial organisations

  a)   Line organisation
  b)   Line and staff organisation
  c)   Functional Organisation

5.   Leadership and Motivation   (05 periods)

  a) Leadership

  - Definition and Need
  - Qualities and functions of a leader
  - Manager Vs leader
  - Types of leadership

  b) Motivation

  - Definitions and characteristics
  - Factors affecting motivation
  - Theories of motivation (Maslow, Herzberg, McGregor)

6.   Management Scope in Different Areas   (10 periods)

  a) Human Resource Management

  - Introduction and objective
  - Introduction to Man power planning, recruitment and selection
  - Introduction to performance appraisal methods

  b) Material and Store Management

  - Introduction functions, and objectives
  - ABC Analysis and EOQ

  c) Marketing and sales

  - Introduction, importance, and its functions
  - Physical distribution
  - Introduction to promotion mix
  - Sales promotion

  d) Financial Management

  - Introductions, importance and its functions

- Elementary knowledge of income tax, sales tax, excise duty, custom duty and VAT

7. Miscellaneous Topics   (05 periods)

   a) Customer Relation Management (CRM)

      - Definition and need
      - Types of CRM

   b) Total Quality Management (TQM)

      - Statistical process control
      - Total employees Involvement
      - Just in time (JIT)

   c) Intellectual Property Right (IPR)

      - Introductions, definition and its importance
      - Infringement related to patents, copy right, trade mark

Note: In addition, different activities like conduct of entrepreneurship awareness camp extension lecturers by outside experts, interactions sessions with entrepreneurs and industrial visits may also be organised.

INSTRUCTIONAL STRATEGY

Some of the topics may be taught using question/answer, assignment or seminar method. The teacher will discuss stories and case studies with students, which in turn will develop appropriate managerial and entrepreneurial qualities in the students. In addition, expert lecturers may also be arranged from outside experts and students may be taken to nearby industrial organisations on visit. Approach extracted reading and handouts may be provided.

RECOMMENDED BOOKS

1. A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)

2. Entrepreneurship Development published by Tata McGraw Hill Publishing Company Ltd., New Delhi

3. Entrepreneurship Development in India by CB Gupta and P Srinivasan; Sultan Chand and Sons, New Delhi

4. Entrepreneurship Development - Small Business Enterprises by Poornima M Charantimath; Pearson Education, New Delhi

5. Entrepreneurship : New Venture Creation by David H Holt; Prentice Hall of India Pvt. Ltd., New Delhi

6. Handbook of Small Scale Industry by PM Bhandari

7. Principles and Practice of Management by L M Prasad; Sultan Chand & Sons, New Delhi.

8. Entrepreneurship by Alpana Trehan; Dream Tech. Press

9. Entrepreneurship by Manimali; Viz Tantra Publications

10. Patterns of Entrepreneurship by Kalpana; Wiley India Publications.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	23	28
2	17	20
3	14	16
4	06	10
5	05	06
6	10	14
7	05	06
Total	**80**	**100**

6.7   EMPLOYABLE SKILLS

L   T   P
Periods/Week   -   -   4

RATIONALE

Diploma holders are required to not only possess subject related knowledge but also soft skills to get good jobs and to rise steadily at their workplace. This subject is included to develop employability skills amongst the students

DETAILED CONTENTS

1.   Industrial Scenario Engineering Education and expectations of competences from an engineer by employer   (04 periods)

2.   Personality types, characteristic and features for a successful engineer

(04 periods)

3.   Professional Engineer desirable values and ethics and their development. Relation between engineering profession, society and environment   (04 periods)

4.   Managing project   (16 periods)

- Leadership
- Motivation
- Time management
- Resource management
- Computer Software
- Interpersonal relationship
- Engineer economics and fundamentals

5.   Effective Communication   (08 periods)

- Listening
- Speaking
- Writing
- Presentation Technique/Seminar
- Group discussion

6.   Preparing for Employment   (08 periods)

- Searching for job/job hunting
- Resume Writing
- Interview technique in personal interview telephonic interview, panel interview, group interview, video conference

7.   Managing Self   (06 periods)

- Managers body, mind, emotion and spirit
- Stress Management
- Conflict resolution

8.   Continuing professional development   (04 periods)

- Organising learning and knowledge

- Use of computer for organising knowledge resource

9. Creativity, Innovation and Intellectual property right   (06 periods)

- Concept and need in present time for an engineer

10. Basic rules, laws and norms to be adhered by engineers during their working

(04 period)

6.8 MAJOR PROJECT WORK

<div align="right">

L T P

Periods/Week -   - 6

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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 (Cabling, Hubs, Switch etc)

- Software Development

- 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

- Web Hosting

- Configuration of Network Operating System(Windows, Linux)

- Configuration of servers (Proxy, DNS etc)

A suggestive criterian 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	20	20	16	12	8	4
4.	Providing solution of the problems or production of final product	20	20	16	12	8	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	10	10	8	6	4	2
9.	Viva voce	10	10	8	6	4	2
	Total marks	**100**	**100**	**80**	**60**	**40**	**20**

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 organizations 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.