

6.1 COMPUTER SYSTEM MAINTENANCE

L T P Cr
2 - 6 5

RATIONALE

The subject provides the students the capability to find faults and repair the computer system, peripheral devices and troubleshoot computer. This subject gives the knowledge and competency to diagnose the faults for trouble shooting for systematic repair and maintenance of computers and computer peripherals.

DETAILED CONTENTS

1. Repair, Servicing and Maintenance Concepts (6 hrs)

Introduction to servicing and maintenance concepts. Meantime between failure (MTBF) networks the repair maintenance policy, potential problems preventive maintenance and corrective maintenance. Circuit tracing techniques. Concept of shielding, grounding and power supply requirements and considerations of computers and its peripherals.
2. Fundamental Trouble Shooting Procedures (4 hrs)
 - Fault location
 - Fault finding aids
 - Service Manuals
 - Test and measuring instruments
 - Special tools
3. Hardware and Software Faults (6 hrs)
 - Trouble shooting techniques
 - Different trouble shooting techniques and methods
 - Functional area approach
 - Split half method
 - Divergent, convergent and feedback path circuits, analysis, measuring techniques.
4. Trouble shooting of computers, component and peripherals (4 hrs)
 - Mother Board
 - FDD (Floppy Disk Drive)
 - HDD (Hard Disk Drive)
 - CD ROM
 - Printers
 - Modems
 - Monitors
 - SMPS
 - DVD – Digital Versatile Disk

5. Sight preparation and design of computer rooms. Testing specifications and installation of computer system and peripherals. (4 hrs)
6. Network Trouble shooting (4 hrs)
LAN failure, cabling connectivity, hubs, bridges, switches failures
7. Managing Network Services (4 hrs)
E-mail, FTP and TELNET Management, IP/TCP, Address Management, DNS, Domain workgroups

LIST OF PRACTICALS

1. Troubleshooting computer hardware failures: keyboard, Monitor, Processor, memory and secondary storage devices
2. Identification of memory related beep codes
3. Demonstration of Registry related problems and registry editing
4. Power on self test (Post) demonstration in various operating systems (OS) as DOS, Windows OSs and UNIX/LINUX
5. Adding and removing software
6. Virus prevention, Detection and Cure
7. Study of problems related to configuration setting during installation of operating system
8. Troubleshooting of serial, parallel, and printer PS2 and USB cables
9. Installation of modems and starting a new internet connection in a stand alone machine.
10. Designing an Extranet by defining virtual private network (VPN)
11. Study of BNC, RJ-45 connectors
12. Preparing straight and cross cables using different standards such as 568 A and 568 B
13. Installing and sharing and troubleshooting network resources of printer, and storage devices.
14. Study of firewalls in a network system

INSTRUCTIONAL STRATEGY

While taking the theory classes, the teachers should lay emphasis on the practical aspects of trouble shooting and maintenance. As the given subject is based on hardware aspects of computer system, it needs lot of technical skills to study it thoroughly, field visit to maintenance repair and assembly centres will be beneficial to the students.

RECOMMENDED BOOKS

1. Electronic test equipment by Khandpur
2. Troubleshooting Computer System by Robert C Benner
3. IBM PC and Clones Govinda Rajalu
4. Computer Maintenance and Repair – Scholi Muller
5. Upgrading your PC by Mark Minersi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	6	20
2.	4	10
3.	6	20
4.	4	10
5.	4	20
6.	4	10
7.	4	10
Total	32	100

6.2 MULTIMEDIA APPLICATIONS

L T P Cr
3 - 6 6

RATIONALE

Multimedia is a new concept emerged in the recent times. Now this technology is being widely used in web pages, motion pictures and interactive presentations, animation etc. Multimedia has made a significant impact in training/education, business presentations, public information access etc. This course intends to introduce and expose multimedia technology and various factors and features of authoring software. It will also help in making the internet application richer in content and presentation

DETAILED CONTENTS

1. Introduction (5 hrs)
Introduction to multimedia, hypertext, hypergraphics, animation, application in education and training, science and technology, business and games
2. Multimedia Hardware (5 hrs)
Multimedia PC configuration, features and specifications of sound and video interfaces, OCR, touch-screen, scanners, digital cameras, speakers, multimedia networks
3. Concept of Multimedia (5 hrs)
Textual information, Bitmap and Vector images, Animation, Digital Audio/Video
2. Multimedia Files (5 hrs)
Image and sound file formats, multimedia file formats, compression, standards and techniques, features of software to read and write such files.
3. Photo-shop (12 hrs)
Image editing tools available in photoshop, concept of channels, layers, filters and actions
4. Flash (8 hrs)
Exploring interface, concept time line/stage relationship, concept of key frame, animating (frame-by-frame, tweening), guiding layers, importing and editing sound and video clips in flash
5. Director (8 hrs)
Exploring interface: score editor, cast editor, toolbars, library, palette, inspector, menu bar, cast libraries, painting techniques, importing images, working with stage, sprites and score; using text, using sound, using digital video, creating behaviour, using behaviour inspector, basics of lingo

LIST OF PRACTICALS

1. Installing and use of various multimedia devices
 - Scanner
 - Digital camera, web camera
 - Mike and speakers
 - Touch screen
 - DVD
 - Reading and writing of different format on a frame CD
 - Transporting audio and video files
 - Using various features of Director
 - Using various features of Flash
 - Using various features of Photo-shop
 - Making multimedia presentations combining Director, Flash, Photo-shop, such as department profile, lesson presentation, games and project presentations

INSTRUCTIONAL STRATEGY

As the subject is practice oriented, more stress should be given to students to do the work practically. The features of software packages Photo-shop, Flash and Director are to be demonstrated in class using LCD projector.

RECOMMENDED BOOKS

1. Multimedia An Introduction by Villam Casanova and Molina; Prentice Hall of India, New Delhi
2. Multimedia Bible by Win Rosch
3. Multimedia Making it work by Baughan, Jay
4. Director and Lingo Bible by John and Nyquist and Rober Martin, IDG Books India Pvt. Ltd.,
5. Mastering Macro Media Director 5 by Feudnon; BPB Publication, New Delhi
6. Photo-shop for Windows Bible by Deke Maclelland IDG Books India Pvt. Ltd., New Delhi
7. Multimedia Technology and Application by Hillman, Galgotia Publications, New Delhi
8. Flash 5 Bible by Rein Hardit, IDG Books India Pvt. Ltd.
9. Flash 5 in easy steps by Vandome IDG Books India Pvt. Ltd.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	5	10
2.	5	10
3.	5	10
4.	5	10
5.	12	20
6.	8	20
7.	8	20
Total	48	100

6.3 ADVANCED MICROPROCESSORS

L T P Cr
4 - 2 5

RATIONALE

The complex systems require high through put that at times is not met with 8-bit microprocessor system, so 16 bit microprocessors based system become suitable and economical, they provide better facilities to personal computers and other industrial systems in variable use 16 bit microprocessor. This course will also provide familiarization with the interfacing techniques.

DETAILED CONTENTS

1. Introduction (10 hrs)
Internal architecture of 8086, internal registers, physical and logical address generation, maximum and minimum modes, clock generation, minimum system, comparison between 8086 and 8088
2. Programming 8086 (12 hrs)
Addressing modes, instruction format, instruction templates and hand assembly instruction set data transfer, arithmetic, bit manipulation, string instructions, program transfer, and processor control instructions, assembler and assembler directives.
3. Programming (8 hrs)
Exercises based on the instruction set and use of assembler
4. Memory and I/O Interface (4 hrs)
Memory interface block diagram, I/O interface (direct and indirect)
5. Interrupt Interface of 8086 (4 hrs)
Types of interrupts, interrupt masking, software interrupts
6. Introduction to 32 bit Microprocessors (12 hrs)
80386, 80486 and pentium, block diagrams and features
7. Brief idea of Interfacing Chips (14 hrs)
8257,, 8279, 8259, 8251 and 8155

LIST OF PRACTICALS

1. Study of instructions of 8086 using Debug
2. Addition and subtraction of multi-byte numbers

3. Multiplication of unsigned/signed numbers
4. Division of unsigned/signed numbers
5. Sorting strings in ascending and descending order
6. Modular programming using subroutines
7. Program to reverse a string interfacing using chips
8. Use of 8279 for (seven segment display)
9. Use of 8155 (for serial communication)

Note: Programming should be done on computer using assembler

INSTRUCTIONAL STRATEGY

The teacher may take help of charts, simulation packages for giving in depth knowledge of the subject to the students. Sufficient programming and interfacing exercises on microprocessors should be given to the students. The practical programming exercises may be performed on the microprocessor kit as well as on computer using TASM or MASM assemblers

RECOMMENDED BOOKS

1. Microprocessor and Applications by DV Hall
2. Microprocessor and Applications by Uffenback
3. Microprocessor and Application by B Raina
4. Introduction to Assembly Language Programming by Ytha-Yu

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	10	15
2.	12	15
3.	8	15
4.	4	5
5.	4	5
6.	12	20
7.	14	25
Total	64	100

Elective-II
6.4 (a) ARTIFICIAL INTELLIGENCE (AI)

L T P Cr
3 - - 3

RATIONALE

The objective of this course is to introduce the concept of Artificial Intelligence (AI) and its application in various areas including game playing, expert systems and natural language understanding. The students will be aware of the techniques and methods involved in developing various applications in these areas. The AI languages PROLOG is also introduced to enable students to develop simple AI applications.

DETAILED CONTENTS

1. Introduction: (06 hrs)
 History, Definition, issues and applications of Artificial intelligence in games, expert systems and natural language understanding.
2. Problem Solving Concepts: (10 hrs)
 State space representation, Importance of search, Heuristic Search techniques – Hill climbing and best first search, Minimax Search, examples using these techniques.
3. Expert Systems (08 hrs)
 Definition and applications, issues, characteristics, Architecture of typical expert system, building an expert system, role of expert knowledge engineer and the user.
4. Knowledge Representation: (10 hrs)
 information and knowledge, issues in knowledge representation, knowledge representation methods – propositional and first order, Predicate logic, Semantic networks.
5. State of the art in Artificial Intelligence (06 hrs)
 Current developments, examples of Robots developed using artificial intelligence techniques, Distributed Artificial Intelligence.
6. Introduction to Prolog: (08 hrs)
 Structure of a Prolog Program, Data Types, various statements of Prolog for representing rules, facts and goals, examples of prolog programs using the above statements.

INSTRUCTIONAL STRATEGY.

This subject is research oriented and involves deep understanding of the concepts. The teacher is expected to frame assignments on various topics to test their understanding.

RECEOMMENDED BOOKS

1. Artificial Intelligence by Elain Rich and Kevin Knight, Tata McGraw Hill Publishing Co, New Delhi
2. Artificial Intelligence and Expert System by Patterson,
3. Artificial Intelligence Techniques by Balaguruswami,
4. Artificial Intelligence and Expert System by Janaki Raman, MacMillan, New Delhi, 2001
5. Artificial Intelligence and Expert System by DW Patterson, Prentice Hall, 1998
6. Artificial Intelligence by Rich and Knight, Tata McGraw Hill, New Delhi, 1998
7. Introduction to Artificial Intelligence by E Chamaik Addison Wesley, California, 2000.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	6	15
2.	10	20
3.	8	15
4.	10	20
5.	6	15
6.	8	15
Total	48	100

Elective-II
6.4 (b) NETWORK SECURITY

L T P Cr
 3 - - 3

RATIONALE

This course has been designed by keeping in view the basic computer users and information system managers. The concepts needed to read through the ripe in the market place and understanding 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)
 Security Architecture, security attacks, security services, security mechanisms, a model for network security, symmetric encryption and asymmetric encryption, placement of encryption function, key distribution, DES and RSA.
2. Number Theory (4 hrs)
 Prime numbers, modular arithmetic, Fermat's and Euler theorems, testing for primality, Euclid's algorithm, discrete logarithms
3. Key Management and Authentication Protocols (10 hrs)
 Key management, Diffie-Hellman key exchange, authentication requirements, authentication protocols
4. Message Authentication and Digital Signatures (8 hrs)
 Digital signatures, digital signature standard (DSS), message authentication codes, hash functions, security of has functions and MACs, MD5 message digest algorithm, Secure Hash Algorithm (SHA-1)
5. Network Security Practice (12 hrs)
 - authentication Applications – Kerberos, X.509 directory authentication service
 - Electronic mail security – Pretty Good Privacy (PGP), S/MIME
 - IP Security – IP security overview, IP security architecture authentication Header, encapsulating security payload
 - Web Security – Web security requirements, Secure Sockets Layer (SSL) and Transport Layer Security (TLS)

6. System Security (10 hrs)
- Intruders – Intruders, intrusion, detection, password management
 - Malicious software – viruses and related threats, virus countermeasures
 - Firewalls – firewall design principles, types of firewall, trusted systems

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. Cryptography and Network Security, fourth Edition, William Stallings, Kilisgner Publications
2. Mastering Network Security by Christ Breton; BPB Publication, New Delhi
3. Web-sites by Chris Breton, BPB Publication, New Delhi
4. Network Firewalls by Kiranjeet Syan; New Rider Publication
5. Internet Security, New Rider Publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	4	10
2.	4	10
3.	10	25
4.	8	15
5.	12	25
6.	10	15
Total	48	100

Elective-II
6.4 (c) WIRELESS COMMUNICATIONS

L T P Cr
3 - - 3

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 (12 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 (9 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 (10 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 (4 hrs)
 FDMA, TDMA, CDMA, SDMA
5. Wireless Networking (5 hrs)
 Different between wireless and fixed telephone networks, development of wireless networks, ISDN
6. Wireless Systems (8 hrs)
 GSM, GSM architecture, CDMA digital cellular standard, IS-95 system, IEEE 802.11b, 802.11G, blue tooth and RF

INSTRUCTIONAL STRATEGY

Explanation of concepts using realtime examples/case studies.

RECOMMENDED BOOKS

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

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	12	25
2.	9	15
3.	10	25
4.	4	10
5.	5	10
6.	8	15
Total	48	100

Elective-II
6.4 (d) DATA MINING AND WAREHOUSING

L T P Cr
3 - - 3

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 (6 hrs)
 - 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 (6 hrs)
 - 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 model, problems with data warehousing, criteria for a data warehouse

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

4. Data Mining Techniques (15 hrs)
 - Cluster analysis
 - Induction, decision trees, rule induction
 - Neural networks
 - On-line analytical processing, OLAP examples
 - Comparison of OLAP and OLTP
 - Data visualization

5. Case Studies on Data Mining Applications and recent trends in data mining (6 hrs)

INSTRUCTIONAL STRATEGY

In this subject, teacher propose to explore the technology of data warehousing and data mining to collect and analyze educational data. The research will develop a model for application of data mining and data warehousing for education, and will implement a web-based educational data collection, analysis, and reporting tool.

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, Cambridge, MA, 2000
3. OLAP Solutions : Building Multidimensional Information Systems by Erik Thomsen, John Wiley & Sons, Inc., 1997 (ISBN 0471014931-4)
4. Data Mining: Technologies, Techniques, Tools and Trends by Bhavani Thuraisingham, CRC Press, ISBN: 0849318157, 1998

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	6	10
2.	6	15
3.	15	30
4.	15	30
5.	6	15
Total	48	100

6.5 ADVANCED COMPUTER ARCHITECTURE

L T P
3 - -

RATIONALE

This course will provide the student with the knowledge of detailed organisation of currently available organisation based on bus structure & principle of working of various other components & also they learn as to how the basic components of computer interact with each other. to form a working system.

DETAILED CONTENTS

1. Information Representation (10 hrs)
Floating and fixed point representation of numbers operand opcode and address – instruction formats and instruction types – addressing modes, timing cycle
2. Central Processing Unit (12 hrs)
Introduction, general register organisation, control word, examples of microinstructions, stack organisation, register stack, reverse Polish notation evaluation of arithmetic expressions. Instruction formats, Addressing modes, 3 address instructions, 2 Address instructions. One address instructions, zero address instructions. Types of interrupts, compare RISC & CISC.
3. Computer Arithmetic (08 hrs)
Introduction, addition & subtraction, multiplication, & Division algorithms.
4. Register transfer & micro operations (04 hrs)
Register transfer language, arithmetic, logic & shift micro operation:
5. Introduction of RISC Processors (6 hrs)
What is RISC technology? Different RISC processors available e.g. SPARC, i860 processor
6. Bus Architecture and Mini Computers (4 hrs)
VME and multibus
7. Pipelining (4 hrs)
Linear pipeline processor, non-linear pipeline processor

INSTRUCTIONAL STRATEGY

As this paper is fully theoretical so it should be teacher in a way to make it interesting by showing charts to the students to enable them to understand the subject thoroughly. Block diagram of computer, algorithms for various arithmetic operations, CDs for demonstration should be used to make the students understand the subject after completing the students must know how the computer works, various types of controllers, memory organization. Overall the students should have the complete knowledge of how computer works.

RECOMMENDED BOOKS

1. Computer System and Architecture by M. Mano: Prentice Hall India Pvt. Ltd., New Delhi.
2. Computer Architecture and Organization by JP Hays, MC Graw Hill company, New Delhi.
3. Advanced Computer Architecture by Kai Hwang, McGraw Hill International Edition.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	10	15
2.	12	25
3.	8	15
4.	4	10
5.	6	15
6.	4	10
7.	4	10
Total	48	100

6.6 MAJOR PROJECT WORK

L	T	P	Cr
-	-	8	4

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 hardware card and its related software (Device Drivers)
- Electronic third eyes and their drivers
- 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	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 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.