6.1 COMPUTER APPLICATIONS IN ARCHITECTURE - III

L	T	P
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RATIONALE

To enable the student to create three dimensional objects in space with special emphasis on presentation and visualization of interiors and exteriors of building using different rendering techniques using auto CAD 2000 or the latest programme. To enable the student to make, render and edit drawings and images using adobe photoshop and corel draw (latest versions); to enable the student to make audiovisual presentations using MS Power point

DETAILED CONTENTS

Note: Relevant theory may be taught along with practical exercises in each topic.

1. Fundamentals of 3-D Drafting (20 hrs)

    1.1 Basic Features
    1.2 Coordinate system
    1.3 3-D entities and surfaces

    Exercises – 1 : Converting simple geometric shapes into 3-D Objects

2. Making an existing 2-D plan drawing compatible to 3-D drafting (16 hrs)

    2.1 Commands and modifications to 2-D drawings
    2.2 B. Poly, rectangle, elevation, extrude – requirements and applications
    2.3 3-D of exterior of blocks – preparation, modification of 2-D drawing
    2.4 3-D of interiors of block – preparation, modification of 2-D drawings

3. 3-D Modeling (30 hrs)

    3.1 Wire frame, surface and 3-D solid modelling
    3.2 Viewing 3-D models
    3.3 Rendering, shading and hide commands
    3.4 Material representation
    3.5 Importing and exporting library

    Exercises – 2 : 4th Semester design proposal to be converted in 3-D model

4. Adobe Photo-shop and Corel Draw (Latest Versions) (10 hrs)

    4.1 Introduction to Abode Photoshop and Corel Draw

4.2 Demonstration of 3-D Max, Corel Draw, Abode Photoshop as a rendering tool for 3-D blocks/walk through etc.

5. Presentation Software like Power Point (20 hrs)

5.1 Creating a simple presentation
5.2 Viewing
5.3 Editing
5.4 Different types of images
5.5 Use of clip art

Exercises

1. Converting simple geometrical shapes into 3-D objects
2. Students will take their second year design proposals and convert them in 3 dimensional presentation models
3. Render the tutorial 2 using photo-shop and Corel Draw
4. Making a PowerPoint presentation of major project done in 5th semester

INSTRUCTIONAL STRATEGY

This is a highly practical oriented subject. Efforts should be made by the teachers to procure relevant softwares and give practical exercises to individual students, so that they develop proficiency in operating computer softwares as applied to the profession of architecture. The theoretical instructions should be dovetailed with practical work. Toward the end of the session each student should be given independent computer based project assignment. Expert lectures from practicing architectural field may be invited to deliver talks and for presentation of live case studies on computers to motivate the students and increase their level of awareness. Special efforts should be made by the teachers to develop well defined small tutorial exercises on each topic and supervise the exercises being performed by the student throughout the session. If need be some basic operational fundamental exercises may be repeated in the beginning of the session. Special emphasis may laid in training the students, to avail help from the user friendly softwares so that they develop confidence and are able to work independently.

6.2 QUANTITY SURVEYING, VALUATION AND SPECIFICATIONS

L	T	P
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RATIONALE

Diploma holders in Architectural Assistantship are supposed to prepare material estimates for various civil works namely; buildings, irrigation works, public health works and roads etc. In addition, they must have basic knowledge regarding analysis of rates, contracting principles of valuation. Therefore, this subject has great importance for diploma holders in Architecture Assistantship.

DETAILED CONTENTS

1. Introduction to quantity surveying and its importance. Duties of quantity surveyor (2 hrs)

2. Types of estimates (4hrs)

   2.1 Preliminary estimates
   - Plinth area estimate
   - Cubic rate estimate
   - Estimate per unit base

   2.2 Detailed estimates
   - Definition
   - Stages of preparation – details of measurement and calculation of quantities and abstract

3. Measurement (4hrs)

   3.1 Units of measurement for various items of work as per BIS:1200

   3.2 Rules for measurements

   3.3 Different methods of taking out quantities – centre line method and long wall and short wall method

4. Preparation of Detailed and Abstract Estimates from Drawings 16 hrs)

   4.1 A small residential building with a flat roof

   4.2 Temporary shelters/sheds

   4.3 Water supply lines for a house

4.4 Sanitary and water supply fittings i.e. septic tank for a domestic building

4.5 Roads/streets network of group housing project

4.6 RCC work in beams, slab, column and lintel

5. Calculation of quantities of materials for (10 hrs)

5.1 Cement mortars of different proportion

5.2 Cement concrete of different proportion

5.3 Brick masonry in cement mortar

5.4 Plastering and pointing

5.5 Painting and polishing

5.6 Cement concrete flooring

5.7 Terrazo flooring

5.8 Steel reinforcement of RCC elements – Beam, lintels, slab and column

6. Analysis of Rates (10 hrs)

6.1 Steps involved in the analysis of rates. Requirement of material, labour, sundries, contractor's profit and overheads

6.2 Analysis of rates for finished items when data regarding labour, rates of material and labour is given:

- Earthwork in excavation hard/ordinary soil and filling with a concept of lead and lift
- Cement concrete in foundation
- RCC in roof slab
- Brick masonry in cement mortar
- Cement Plaster
- Painting and polishing

6.3 Running and maintenance cost of construction equipment

7 Measurement Book and Billing (6hrs)

Entries in measurement book, standard measurement book, checking of measurement, preparation of bill, first and final bill, running account bill, advance payment, secured advance payment, refund of security money

8 Valuation (6hrs)

8.1. Purpose of valuation, principles of valuation
8.2. Definition of various terms related to valuation like – depreciation sinking fund, salvage and scrap value, market value, fair rent, year's purchase etc
8.3. Method of valuation
- Replacement cost method
- Rental return method

9 Specifications (6 hrs)

General and detailed specifications of :

9.1 Single storey buildings
9.2 Double storey buildings
9.3 General specification 1st, 2nd, 3rd and 4th class buildings

INSTRUCTIONAL STRATEGY

This is an applied engineering subject. Teachers are expected to provide working drawings for various civil works and students be asked to calculate the qauantities of materials required for execution of such works. Teachers should conceptualise making analysis of rates for different items of works. It will be advantageous if students are given valuation reports for reading.

RECOMMENDED BOOKS

1. Pasrija, HD; Arora, CL and S. Inderjit Singh, "Estimating, Costing and Valuation (Civil)", Delhi, New Asian Publishers

2. Rangwala, BS; Estimating and Costing". Anand, Charotar Book Stall

3. Kohli, D; and Kohli, RC; "A Text Book on Estimating and Costing (Civil) with Drawings", Ambala Ramesh Publications

4. Chakraborti, M; "Estimating, Costing and Specification in Civil Engineering", Calcutta

5. Dutta, BN; "Estimating and Costing

6.3 ARCHITECTURAL PROFESSIONAL PRACTICE

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RATIONALE

The knowledge of this subject is required for all engineer/technicians who wish to choose industry/field as their career. This course is designed to develop understanding of various functions of management, role of workers and architects and providing skills with respect to marketing, industrial safety, CPM, PERT, communication and enterpreneurship etc. which are essential attributes for a successful technician.

DETAILED CONTENTS

1. Tenders and Quotations (4 hrs)

   - Tenders, essential characteristics of a tender notice, types of tender, tender documents, simple exercises on preparation of tender document, comparative statements (technical and cost comparisons), work order, supply order, Inspection

2. Contract (4 hrs)

   - General Principles of contract
   - Types of contract and their advantages and disadvantages and suitability
   - Architect duties and liabilities under the contract
   - Contractors duties and liabilities
   - Employer's duties sand liabilities

3. Architect and his work (2 hrs)

   - Structure of an architect's office
   - Office and management
   - Architects duties to his employees under labour welfare provision

4. Code, competition fees (2 hrs)

   - Architectural competitions, professional conduct, conditions of engagement and Scale of professional fees and charges.

5. Architect act, 1972 (4 hrs)

6. Human relations (6 hrs)

   - Human relations and performance in organisation
   - Understand self and others for effective behavior
   - Behavior modification techniques
   - Industrial relations: Relation with subordinates, equals (peers) and superiors
   - Characteristics of group behavior

- Mob psychology-grievance, agitation's, strikes and lockouts
- Handling of grievances and negotiation techniques
- Absenteeism
- Labour turmoil – its causes, effects and remedies
- Labour welfare

7. Communication (6 hrs)

- Importance of communication
- The communication process
- Barriers to communication
- Making communication effective
- Listening in communication

8. Conflicts (4 hrs)

- Genesis of conflicts
- Interpersonal, interpersonal, intergroup conflicts
- Resolving conflicts Team Building

9. CPM and PERT (8 hrs)

- Introduction to CMP & PERT
- Development of CMP networks Pertaining to simple engineering works

10. Enterperneurship (8 hrs)

- Concept of enterpreneurship
- Need of enterpreneurship in the context of prevailing employment and economic condition of the country
- Successful enterpreneurship, training for entrepreneurship development
- Basic resources: financial, technological, human & information resources and other entrepreneurship support system

REFERENCE BOOKS

1. Professional practice by Roshan Namavati

2. Tender Documents by Labour Law

6.4.1 LANDSCAPE DESIGN (ELECTIVE-I)

L	T	P
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RATIONALE

The basic knowledge of elements related to landscaping and their principles are very essential for the students of Architecture Assistantship. Through this subject, the students shall be introduced to relationship of landscaping and climate, besides an understanding of outdoor functional spaces.

DETAILED CONTENTS

1) Elements of Landscape (6 hrs)

   a) Plants (Tress, shrubs, ground covers, Flowering species)
   b) Water
   c) Earth forms and stones
   d) Artificial or man-made elements

2. Principles of landscape design with respect to architectural functions (20 hrs)

   a) Form
   b) Symmetry and Balance
   c) Texture
   d) Colour
   e) Contrast
   f) Proportions and scale
   g) Simplicity
   h) Focus
   i) Rhythm
   j) Aesthetics (Visual aspects and functional aspects)

3. Relationship of landscape & climate (6 hrs)

   a) Orientation
   b) Sun Control by Plants
   c) Wind control by plants
   d) Microclimate and Human comfort

4. Outdoor functional spaces with respect to different building types (6 hrs)

PRACTICAL EXERCISES (10 hrs)

1. Landscape design of an outdoor area with in an existing building or group of buildings

2. Landscape design of the architectural design project students are currently working on.

RECOMMENDED BOOKS

1. Landscape Architecture by symonds published by MC. Graw Hill, Book Company
2. Urban Landscape Design by Garnett Eckko Published by M.C. Graw Hill, Book Company
3. Landscape Design that save energy by Anne Simon Majfat & Marc Schiler
4. Flowering trees of India and beautiful gardens of India by M.S. Randhawa
5. Flowering trees by Rajnish Wattas
6. The Landscape of Man – Geoffrey Jellicoe, Publisher Thames and Hudson London (1995)
7. A Visual Approach to Park Design – Albert J Rutledge, Publisher Garland STPM Press, New York (1981)
8. Landscape Architecture – Simonds John O, Publisher Mc Graw Hill Book Company London (1961)
9. Earthscape : A Manual of Environmental Planning – Simonds John O, Publisher Mc Graw Hill Book Company London (1978)
10. Trees in Chandigarh – Ms Randhawa, Publisher

6.4.2 HOUSING (ELECTIVE-I)

L	T	P
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RATIONALE

The students of Architectural Assistantship should have sufficient understanding about the various policies of EWS, LIG, MIG, HIG etc. Through this subject, they shall be given an ideas about the housing policy, financing schemes and state housing development agencies.

DETAILED CONTENTS

1. Housing as a human need, social, cultural and economic factors affecting the housing needs. (4 hrs.)

   Type of housing

   Detached, semi detached, Patio Type, Row houses, apartments. (6 hrs.)

1. Layouts of housing

   Row type, curvilinear, cluster, cul-de-sacs, high rise (any one example of each layout) (8 hrs.)

2. Housing standards with reference to building codes

   Zoning, Density, FAR, Set backs, height (4 hrs.)

3. Housing for (8 hrs.)

   - Economically weaker sections
   - Low income group/Middle income group.
   - Site and services scheme.
   - Slum clearance/Slum upgradation
   - Various standards & policy with one example of each type.

4. Cost effective building technology and materials in housing. (4 hrs.)

5. Housing policy & finance

   Role of Government (Hudco and National Housing Board) in housing, Public-private participation, co operative housing. (6 hrs.)

8. Study of housing in a neighbourhood unit with reference to circulation pattern, open spaces shopping, health and educational facilities. (e.g. study to be done as a group project) (8 hrs.)

RECOMMENDED BOOKS

1. Town & country planning by V.N. Modhak.
2. Town Planning made plain-Louis Keeble.

6.4.3 TOWN PLANNING (ELECTIVE-I)

L	T	P
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RATIONALE

To develop an understanding about the components of town planning and to equip the student with requisite knowledge to assist in the preparation of master plans, layout of housing/urban development schemes.

DETAILED CONTENTS

1. Overview of town planning: Principal elements and the location of public functions with reference to (14 hrs.)

   a) Greek towns
   b) Roman Military Towns
   c) Italian Hill Towns
   d) Medieval Fortified Towns
   e) Renaissance Ideal Towns

2. Growth of the Industrial Town (6 hrs)

   a) Need & Purpose
   b) Characteristics of the Factory Town
   c) Trends in Modern town Planning:

      - Linear city- Soria Y Mata
      - Garden city- Ebenezev Howard
      - Broad acre city- Le corbusier

3. Planning Process: Site Selection, Land uses in a town, their hierarchy and location. Types of town shapes with reference to circulation (Linear, Star, grid, Satellite). (4 hrs)

4. Road and street systems: Road and town aesthetics (4 hrs)

5. Introduction to Urban land uses & their management. (14 hrs.)

   a) Zoning: Need and purpose in a master plan. Density-net and gross, bulk & height. FAR, FSI
   b) Neightbourhood- The neighbourhood concept by Clarence Stein. Functions of a neighbourhood, population size and layout, with respect to the chandigarh sector. Distributions of facilities within a neighbourhood (shopping, health, education and recreation).

c) Circulation System- Hierarchy of road network in a town. Modes of transport and modal split in a town. Familiarisation with terms: Traffic flow, peak hour volume, traffic distribution.
d) Commercial Areas: Hierarchy of Commercial Area in a Town/City and their foundation (Vis-à-vis the population they serve)
e) Open Spaces: Their location, distribution and hierarchy within a town.

Note: For each of the above land uses a suitable town plan is to be studied, analysed to be submitted as a report

6. Legislation and Urban Controls (6 hrs.)

a) Need and purpose of development controls in towns.
b) Obligatory and discretionary functions of Urban Local Bodies and Development Authorities.

RECOMMENDED BOOKS

1. Urban Design of Towns & Cities – Paul D. Spreiregen
2. Urban Pattern- Cyallion B Fischer
3. Town Planning made Plain-Lewis Keeble
4. From Pre History to Post Modernism-Isabelle Hyman
5. Town Planning in Ancient India-
6. World Architecture-Patrick Nutgens
7. Fundamentals of Town Planning- Hiraskar
8. The Making of Cities- Walter Bar
9. Town and Country Planning-John Ratctiffe
10. Towns cape-Gordon Cullen
11. Town Planning – SC Rangwala
12. Ancient and Medieval Town Planning in India-Prabhakar V. Begde
13. Text Book of Town Planning-Abir Bandyo Padhyay
14. Space,tune & Architecture-Sigrfried Cyicdreon
15. Text Book of Town Planning – Abir Bandyopadhyay Publisher – Arunabha Sen Books and Allied (P) Ltd. 8/1 Chintamani Das Lane, Calcutta 700 009
16. Urban Pattern – Gallion & Eisner, Publisher – Van Nostrand Reinhold, USA (1984)
17. Architecture of Towns & Cities – Paul D.Spreiregen, Publisher- Mc Graw Hill Book Company, New York (1969)
18. Town Design – Frederick Gibberd , Publisher – Architectural Press, Great Britain (1967)
19. Town Planning – Hiraskar, Publisher
20. Town and Country Planning & Housing – VN Modak, Publisher
21. Town Planning made Plain – Lewis Keeble, 1983,Publisher Longman Group Ltd.
22. Matrix of Man – Moholy Sibyl Nagy, Publisher – Pall Mall Press, London (1968)

6.5.1 SITE MANAGEMENT (ELECTIVE-II)

L	T	P
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RATIONALE

Many a times the contractors engage the services of Architectural Assistants to manage the construction sites. The students should have sufficient knowledge of CPM/PET, Safety at site and labour welfare schemes.

DETAILED CONTENTS

1. Introduction to Site Planning & Management (6 hrs.)

   - Significance
   - Objectives & Functions of Construction Management
   - Resources for construction
   - Construction Team

2. Construction Planning (6 hrs.)

   - Introduction to planning
   - Latest Breakdown Structure.
   - Schedule
   - Preparation of material, equipment, labour & finance schedules.

3. Network Technique (12 hrs.)

   - Introduction
   - Critical Path Method (CPM)
   - Progressive Evaluation & Review Technique (PERT)
   - Introduction network development & analysis (with simple examples)

4. Site organization (6 hrs.)

   - Principles of organization
   - Communication, leadership & Human relation
   - Site organization
   - Temporary services
   - Job Layout

5. Inspection & Quality Control (8 hrs.)

   - Need for inspection & Quality Control
   - Principles of inspection

- Enforcement of specification
- Stage of inspection & Quality Control

6. Safety in Construction (18 hrs.)

- Importance of safety
- Safety measures in different construction activities
- Excavation
- Drilling & Blasting

7. Construction Labour (2 hrs.)

- Status of construction labour
- Trade Union connected with construction industry.

RECOMMENDED BOOKS

1. Consturction Planning & Management by PS Gahlot & BM Dhir International (P) ltd., Publisher, New Delhi.

6.5.2 INTERIOR DESIGN (ELECTIVE-II)

L	T	P
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RATIONALE

Students of Architectural Assistantship at the diploma level are expected to know, design and execute building interiors. Therefore, the basic knowledge of building construction and detailed knowledge of building materials is required. With the knowledge of this subject the students can help in handling interior projects from the concept stage to the project implementation stage. Also this exercise is necessary since the interiors are becoming more integral part of architecture and considerable stress is being laid in interior design.

Teachers while imparting instructions are expected to explain concepts and principles introducing various building finishing materials. The course would be supplemented with literature and samples of materials.

DETAILED CONTENTS

6. Space Analysis (3 sheets) (4 hrs)

   a) Living Room
   b) Dinning
   c) Kitchen
   d) Bedrooms, Children bedrooms
   e) Toilets (Public, Residential)
   f) Restaurants/fast foods
   g) Lobbies/Waiting space
   h) Office
   i) Shops

2. Case Studies of Live projects with respect to circulation, activities, furniture (6 hrs.)

   a) Houses
   b) Offices
   c) Shops
   d) Restaurant/Fast Food

NOTE: Any one case study to be taken in the form of report with the help of sketches and photographs.

3. Materials (4 hrs.)

   Market survey of materials, appropriate uses of materials for wall finishes, flooring/ceiling etc.

4. Details (5 sheets) (12 hrs.)

   a) Furniture
   b) Storage
   c) Partition
   d) False ceiling
   e) Panelling

5. Electrical Layout in Interiors (6 hrs)

6. Interior Design problem of Restaurants, Houses, Offices, Shop (Any one project to be taken) (16 hrs)

   a) Detailed Plan
   b) Layout (following pattern, furniture)
   c) Sectional elevation (wall treatments)
   d) One point perspective
   e) Details of furniture, storage, partition, fake ceiling
   f) Electrical layout
   g) Colour Schemes
   h) Indoor Plants

Following books/magazines may be used for reference study material:

BOOKS:

1. Time sever standards for Interior Design and sapce planning.
2. Interior Design by Ahmed Kasu.
3. Nufert Archtect's data

MAGAZINES

a) Inside out side
b) Indian design magazine
c) Society exteriors

RECOMMENDED BOOKS

1. Time sever for satore planning and design-Charles E. Brondy
2. The best interiors and life styles of India-by the Indian and Eastern Engineering Co Ltd.,
3. Human Relastion's oliver (latest volume)
4. Indian Interiors (by Angelika Tashen.).
5. Inter-wood (Publiched by Monica International)
6. Design & decorate: Living room
7. Design & decorate: Bathroom

6.5.3 BUILDING MAINTENANCE (ELECTIVE-II)

L	T	P
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RATIONALE

Besides planning/designing new buildings, the students of Architectural Assistantship working in the estate development have to plan and execute the repair works of existing civil works. The aim is to provide in depth understanding of building repair and maintenance to the students.

DETAILED CONTENTS

1.	Principles of Building Maintenance & its economic constructions	(6 hrs)
2.	Identifying the sources of problems in interiors & exteriors of building	(6 hrs)
3.	Causes of dampness and remedies for removing dampness	(6 hrs)
4.	Defects & repair in roofs	(10 hrs)
5.	Common defects & their repair in buildings	(6 hrs)
6.	Surface finishes defects & repairs	(6 hrs)
7.	Maintenance of water supply & Drainage systems	(8 hrs)

RECOMMENDED BOOK

1. Building construction by Sushil Kumar
2. Building construction by B.C. Punia
3. Maintenance of building by Gurcharan Singh

6.6 PORTFOLIO (MAJOR PROJECT)

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Project work aims at developing skills in the students whereby they apply the totality of knowledge and skills gained through the course in the solution of particular problem or undertaking a project. The students have various 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 session to identify suitable project assignments. 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 for a group. The students should identify or given project assignment at least two to three months in advance. The project work identified in collaboration with industry may be preferred.

Each teacher is expected to guide the project work of 5-6 students.

The purpose of the portfolio (major project) should be to design and represent a chosen a realistic Architectural design problem for presentation to a client and execution on site.

One project chosen by individual students to be developed in the following stages:
(The project should be having coverage of about 1000 Sqm.)

- Pre-design studies culminating in a report comprising study of activity, users, individual space analysis, inter-relationship of spaces, one case study, and conclusions regarding above mentioned aspects.

- Detailed design of the project to be presented through rendering presentation and detailed model

- Report writing/portfolio including complete working drawings with details of the design project.

- Power presentation of the complete project work

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		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.**