Curriculum for

Diploma Programme in

ARCHTECTURAL ASSISTANTSHIP

For the State of Uttar Pradesh

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APPROVED IN CDC MEETING OF BTE,UP,LKO DATED:26-09-2021

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1. SALIENT FEATURES OF DIPLOMA PROGRAMME IN ARCHITECTURAL ASSISTANTSHIP

1) Name of the Programme : Diploma Programme in Architectural Assistantship

2) Duration of the Programme : Three years (Six Semesters)

3) Entry Qualification : Matriculation or equivalent NSQF Level as Prescribed by State Board of Technical Education, UP

4) Intake : 60 (or as prescribed by the Board)

5) Pattern of the Programme : Semester Pattern

6) NSQF Level : Level - 5

7) Ratio between theory and Practice : 45 : 55 (Approx.)

8) Industrial Training:

Four weeks of Professional training is included after IV semester during summer vacation. Total marks allotted to industrial training will be 50.

9) Ecology and Environment :

As per Govt. of India directives, a subject on Environmental Studies has been incorporated in the curriculum.

10) Energy Conservation:

A subject on Energy Conservation has been incorporated in the curriculum.

11) Entrepreneurship Development:

A full subject on Construction Management, Accounts and Professional Practice has been incorporated in the curriculum.

12) Student Centered Activities:

A provision of 3-6 hrs per week has been made for organizing Student Centered Activities for overall personality development of students. Such activities will comprise of co–curricular activities such as expert lectures, self study, games, hobby classes like photography, painting, singing etc. seminars, declamation contests, educational field visits, NCC, NSS and other cultural activities, disaster management and safety etc.

13) Project work

A project work has been included in the curriculum to enable the student get familiarize with the practices and procedures being followed in the field of Architecture and provide an opportunity to work on some live projects (as well as Case studies) in the Architectural world.

2. EMPLOYMENT OPPORTUNITIES FOR DIPLOMA HOLDERS IN ARCHITECTURAL ASSISTANTSHIP

Keeping in view, the present scenario of activities in the field of Architecture, following employment opportunities are visualized for diploma holders in Architectural Assistantship:

a) Wage Employment in:

i) State Department of Architecture
ii) State Department of Town and Country Planning
iii) Central Public Works Department
iv) State Housing Boards and Corporations
v) State Urban Development Agency
vi) Railways
vii) Military Engineering Services
viii) Local Bodies
ix) Survey of India
x) State Electricity Department/Boards
xi) Telecommunication Department
xii) Teaching profession
xiii) Public sector / private construction companies/ Architectural firms or Offices.
xiv) Service sector i.e. Estate Offices of Business organizations/ Universities/Colleges, Hotels , Hospitals etc. specially for repair and maintenance of buildings and their upkeep.
xv) Supervision work for various construction sites.
xvi) Drafting on AutoCAD / Revit for Outsourcing companies
xvii) Technical institutions.

b) Self employment opportunities:

i) Approved building planner from Local Authorities
ii) Execution and supervision of Renovation projects
iii) Preparation of 3-D Perspective views of buildings for Architects and consultants
iv) Own unit / enterprise for
a) Model Making
b) Landscaping
c) Drawings on CAD/ REVIT

v) Interior design related works like: White washing, distempering, repair and maintenance of buildings, POP work, texture work, false ceiling, specialized flooring ,Anti - termite treatment etc.

vi) Establishing an Outsourcing company of Computerized Drafting

vii) Construction material suppliers/ marketing

viii) Estimating and costing jobs/ bill of Quantities

ix) Water proofing of existing and new building

x) Rain water harvesting system installation

xi) Services to architectural and construction firms:

-Site Supervision
-Site Surveying and layout
-Estimation and Billing
-Site/ marketing of building components
-Liaison work

3. LEARNIG OUTCOME OR COMPETENCY PROFILE OF DIPLOMA HOLDERS IN ARCHITECTURAL ASSISTANTSHIP

Keeping in view the employment opportunities given above, following are the important activities (priority-wise) of diploma holders in Architectural Assistantship:

i) Preparation and Interpretation of drawings:
- Preliminary drawings (Line plans, sketching, tracing)
- Presentation drawings (Rendering in black and white, colour, perspective drawings)
- Submission drawings
- Structural drawings
- Working drawings and detailing
- Preparation of prints and plots and their upkeep
- Maintenance of drawing records and files
- Services drawings

ii) Preparation of small building designs, master plans and layouts

iii) Site supervision/ management i.e. measuring, surveying and inspection

iv) Preparation of models:
- Study models
- Block models
- Detailed Model

v) Assistance in preparation of tender documents and cost estimates, including valuation

vi) Preparation of submission documents for approval from Development Authorities

vii) Interior designing, execution and layout

viii) Management of Architect's office

ix) Market survey of construction materials

Keeping in view the employment opportunities and job profile of diploma holders of Architectural Assistantship, following LEARNING OUTCOME or competencies are required to be developed in the students:

i) Development of skills in free-hand sketching, lettering and preparation of presentation, submission, structural and working drawings and detailed thereof

ii) Development of basic knowledge and skills for preparing small building designs and layouts

iii) Development of skills in model making using different materials

iv) Development of skills in preparation of municipal drawings/ submission drawings, corporation drawings and related documents

v) Development of knowledge and skills in site management comprising of measurement, surveying and inspection

vi) Development of basic knowledge and skills in preparing rough estimates, preparation of detailed estimates and tender documents for small buildings

vii) Development of skills in taking out prints/ plots, cloth mounting, colouring and folding of prints and their up keep

viii) Appreciation of basic knowledge regarding various building materials and construction techniques

ix) Development of basic knowledge about elements & principles of theory of design

x) Development of basic knowledge of history of architecture, town planning and building bye-laws, with emphasis on construction techniques

xi) Development of knowledge and skills in applications of computers in architecture

xii) Development of basic understanding of resource systems helping in the financing of small enterprises

xiii) Development of basic knowledge of climatology, environment and ecology

xiv) Understanding the behavior of structural elements of building

xv) Development of basic understanding of building services

xvi) Development of communication and managerial skills

xvii) Development of basic hand-on practice skills

xviii) Demonstrate appropriate values and attitude.

4. DERIVING CURRICULUM AREAS FROM LEARNING OUTCOME / COMPETENCY PROFILE

Sr.	Competency Profile	Curriculum Areas
1.	Apply basic principles of Mathematics and Science to solve engineering problems	• Applied Mathematics • Applied Physics • Applied Chemistry
2.	Development of skills in free-hand sketching, lettering and preparation of presentation, submission, structural and working drawings and detailed thereof	• Graphic Presentation and Art • Architectural Design (Basic) • Construction and Material • Building Science (Climatology, P.H.E. and Electrical services) • Structure
3.	Development of basic knowledge and skills for preparing small building designs and layouts	• Architectural Design • Building Science (Climatology, P.H.E. and Electrical services) • Construction and Material • Landscape Design
4.	Development of skills in model making using different materials	• Architectural Design
5.	Development of skills in preparation of municipal drawings /submission drawings / corporation drawings	• Architectural Design • Municipal Drawing
6.	Development of knowledge and skills in site management comprising of measurement, surveying and inspection	• Construction and Material • Surveying • Construction Management, Accounts and Professional Practice
7.	Development of basic knowledge and skills in preparing tender documents, rough estimates and also preparation of detailed estimates for small buildings	• Surveying • Estimating, Costing and Specifications
8.	Development of skills in taking out prints, cloth mounting, colouring and folding of prints/ plots and their up keep	• Working Drawing • Architectural Design • Construction Management, Accounts and Professional Practice • Basics of Information Technology

9.	Development of basic knowledge regarding various building materials and construction techniques	• Construction and Material • Project and Professional Training
10.	Appreciation of basic knowledge about elements and principles of theory of design	• Graphic Presentation and Art • Architectural Design
11.	Development of basic knowledge of history of architecture, town planning and building drawings with emphasis on computer techniques	• Computer Aided Design • Town Planning • History of Architecture
12.	Development of basic knowledge and skills in applications of computers in architecture	• Basics of Information Technology • Software Applications in Architecture
13.	Development of basic understanding of resource systems helping in the financing of small enterprises	• Construction Management, Accounts and Professional Practice
14.	Development of basic knowledge of climatology, environment, Energy conservation and ecology	• Building Science (Climatology, P.H.E. and Electrical services) • Environmental Studies • Energy conservation
15.	Understanding the behaviour of structural elements of building	• Structures
16.	Development of basic understanding of building services	• Building Seience • Architectural Design
17.	Development of communication and Soft skills	• Communication Skills • Student Centred Activities
18.	Use basic concepts and principles of fluid mechanics as applied to Architectural practices.	• Applied Mechanics
19.	Development of basic hand-on practice skills	• Workshop Practice
20.	Demonstrate appropriate values and attitude.	• Student Centred Activities • Universal Human Values

5. ABSTRACT OF THE CURRICULUM AREAS

a) General Studies

1. Communication Skills-1 and 11
2. Basics of Information Technology
3. Energy Conservation
4. Environmental Studies
5. Universal Human Values

b) Applied Sciences

6. Applied Mathematics
7. Applied Physics
8. Applied Chemistry

c) Basic Courses in Architecture / Technology

9. History of Architecture-A and B
10. Graphic Presentation and Art

d) Applied Courses in Architecture / Technology

11. Applied Mechanics
12. Construction and Material-1
13. Architectural Design-A (Theory of Design)
14. Building Sciences (Climatology, P.H.E. and Electrical services)
15. Architectural Design-B (Model Making, Working Drawings, Perspective view)
16. Surveying
17. Construction and Material-11
18. Computer Aided Design
19. Structure-A
20. Architectural Design-C (Interior Schemes, Landscape Design, Municipal Drawings)
21. Town Planning
22. Estimating, Costing and Specifications
23. Professional Training
24. Structure-B

25. Architectural Design-D (Group Housing, Commercial Complex, Community Buildings)
26. Earthquake Engineering Concepts
27. Software Applications in Architecture
28. Construction and Material-111
29. Construction Management, Accounts and Professional Practice
30. Portfolio (Major Project)

6. HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS

Sr. No.	Subject	Distribution of Periods / week in various semesters					
		I	II	III	IV	V	VI
1.	Communication Skills	6	-	-	6	-	-
2.	Applied Mathematics	5	5	-	-	-	-
3.	Applied Physics	7	-	-	-	-	-
4.	Applied Chemistry	7	-	-	-	-	-
5.	Graphic Presentation and Art	13	-	-	-	-	-
6.	General Workshop Practice	8	8	-	-	-	-
7.	Applied Mechanics	-	7	-	-	-	-
8.	Basics of Information Technology	-	6	-	-	-	-
9.	Construction and Material	-	7	6	-	-	10
10.	Architectural Design	-	12	12	16	16	-
11.	History of Architecture	-	-	5	5	-	-
12.	Surveying	-	-	10	-	-	-
13.	Building Sciences (Climatology, P.H.E. & Electrical Services)	-	-	7	-	-	-
14.	Computer Aided Design	-	-	6	-	-	-
15.	Structure	-	-	-	7	8	-
16.	Town Planning	-	-	-	5	-	-
17.	Estimating, Costing and Specifications	-	-	-	7	-	-
18.	Software Applications in Architecture		-	-	-	8	-
19.	Energy Conservation	-	-	-	-	5	-
20.	Environmental Studies	-	-	-	-	5	-
21.	Earthquake Engg. Concepts	-	-	-	-	4	-
22.	Professional Training	-	-	-	-	-	-
23.	Universal Human Values	-	-	-	-	-	3
24.	Construction Management , Accounts &Professional Practice	-	-	-	-	-	8
25.	Portfolio (Major Project)	-	-	-	-	-	20
26.	Student Centered Activities	2	3	2	2	2	7
	TOTAL	48	48	48	48	48	48

7. STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN ARCHITECTURAL ASSISTANTSHIP

FIRST SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P/drg		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
1.1	*Communication Skills-I	*4*	-	2	*4*	*20*	10	30	50	2 ½	20	3	70	100
1.2	*Applied Mathematics - I	*5*	-	-	*4*	*20*	-	20	50	2 ½	-	-	50	70
1.3	*Applied Physics – I	*5*	-	2	*5*	*20*	10	30	50	2 ½	20	3	70	100
1.4	*Applied Chemistry	*5*	-	2	*5*	*20*	10	30	50	2 ½	20	3	70	100
1.5	Graphic Presentation and Art	*5*	-	8	*6*	*50*	-	50	125	4	-	-	125	175
1.6	General Workshop Practice - I	*-*	-	8	*2*	*-*	40	40	-	-	60	4	60	100
#Student Centered Activities (SCA)		*-*	-	2	*1*	*-*	30	30	-	-	-	-	-	30
Total		***24***	**-**	**24**	***27***	***130***	**100**	**230**	**325**	**-**	**120**	**-**	**445**	**675**

* Common with other diploma programmes

\# Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities and self study etc.12

SECOND SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P/drg		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
2.1	*Applied Mathematics - II	*5*	-	-	*4*	*20*	-	20	50	2 ½	-	-	50	70
2.2	+Applied Mechanics	*5*	-	2	*5*	*20*	10	30	50	2 ½	20	3	70	100
2.3	*Basics of Information Technology	*-*	-	6	*2*	*-*	40	40	-	-	60	3	60	100
2.4	Architectural Design - A (Basic Design)	*4*	-	8	*6*	*50*	-	50	125	4	-	-	125	175
2.5	Construction and Material - I	*3*	-	4	*5*	*30*	-	30	70	2 ½	-	-	70	100
2.6	General Workshop Practice -II	*-*	-	8	*2*	*-*	40	40	-	-	60	4	60	100
#Student Centered Activities (SCA)		*-*	-	3	*1*	*-*	30	30	-	-	-	-	-	30
Total		**17**	**-**	**31**	**25**	**120**	**120**	**240**	**295**	**-**	**140**	**-**	**435**	**675**

* Common with other diploma programmes

\+ Common with diploma in Civil Engg., Mechanical Engg. and Chemical Engg

\# Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities and self study etc

THIRD SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P/drg		*Th*	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
3.1	History of Architecture - A	3	2	-	3	20	-	20	50	2 ½	-	-	50	70
3.2	Building Science (Climatology, P.H.E. & Electrical Services)	5	2	-	5	30	-	30	70	2 ½	-	-	70	100
3.3	Architectural Design - B	4	-	8	6	50	-	50	125	8	-	-	125	175
3.4	Surveying	2	-	8	5	10	20	30	50	2 ½	50	3	100	130
3.5	Construction and Material - II	3	-	3	4	30	-	30	70	2 ½	-	-	70	100
3.6	Computer Aided Design	-	-	6	3	-	20	20	-	-	50	3	50	70
#Student Centered Activities (SCA)		-	-	2	1	-	30	30	-	-	-	-	-	30
Total		**17**	**4**	**27**	**27**	**140**	**70**	**210**	**365**	**-**	**100**	**-**	**465**	**675**

Student Centered Activities will comprise of co-curricular activities like extension lectures, self study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

FOURTH SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P/drg		*Th*	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
4.1	*Communication Skill-II	*4*	-	2	*4*	*20*	10	30	50	2 ½	20	3	70	100
4.2	Town Planning	*3*	-	2	*4*	*25*	-	25	50	2 ½	-	-	50	75
4.3	Structure - A	*5*	2	-	*5*	*30*	-	30	70	2 ½	-	-	70	100
4.4	History of Architecture - B	*3*	2	-	*3*	*20*	-	20	50	2 ½	-	-	50	70
4.5	Architectural Design - C	*4*	-	12	*6*	*50*	-	50	150	12	-	-	150	200
4.6	Estimating, Costing and Specifications	*5*	2	-	*4*	*30*	-	30	70	2 ½	-	-	70	100
#Student Centered Activities (SCA)		-	-	2	*1*	-	30	30	-	-	-	-	-	30
Total		*24*	**6**	**18**	*27*	*175*	**40**	**215**	**440**	**-**	**20**	**-**	**460**	**675**

* Common with other diploma programmes

- 4 weeks Professional training will be organised after 4th Semester exam. The evaluation of this training will be done in 6th semester.

\# Student Centered Activities will comprise of co-curricular activities like extension lectures, self study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

FIFTH SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P/drg		*Th*	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
5.1	*Energy Conservation	*3*	-	2	*3*	*20*	*10*	30	50	2 ½	20	3	70	100
5.2	*Environmental Studies	*3*	-	2	*3*	*20*	10	30	50	2 ½	20	3	70	100
5.3	Earthquake Engineering Concepts	*4*	-	-	*3*	*20*	-	20	50	2 ½	-	-	50	70
5.4	Architectural Design - D	*4*	-	12	*6*	*50*	-	50	150	12	-	-	150	200
5.5	Structure - B	*6*	2	-	*5*	*30*	-	30	70	2 ½	-	-	70	100
5.6	Software Application in Architecture	*-*	-	8	*4*	*-*	20	20	-	-	50	3	50	70
#Student Centered Activities (SCA)		*-*	-	2	*1*	*-*	30	30	-	-	-	-	-	30
Total		***20***	**2**	**26**	***25***	***140***	**70**	**210**	**370**	**-**	**90**	**-**	**460**	**670**

* Common with other diploma programmes

\# Student Centered Activities will comprise of co-curricular activities like extension lectures, self study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

SIXTH SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P/drg		*Th*	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
-	Professional Training	-	-	-	*2*	-	-	-	-	-	50	3	50	50
6.1	*Universal Human Values	*2*	-	1	*1*	-	20	20	-	-	30	3	30	50
6.2	Construction Management, Accounts and Professional Practice	*6*	2	-	*4*	*30*	-	30	70	2 ½	-	-	70	100
6.3	Construction and Material - III	*6*	-	4	*5*	*30*	-	30	70	2 ½	-	-	70	100
6.4	Portfolio (Project Work)	*4*	-	16	*8*	-	50	50	-	-	100	-	100	150
#Student Centered Activities (SCA)		-	-	7	*1*	-	30	30	-	-	-	-	-	30
Total		***18***	**2**	**28**	***21***	***60***	**150**	**210**	**140**	**-**	**230**	**-**	**370**	**480**

Student Centered Activities will comprise of co-curricular activities like extension lectures, self study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

8. GUIDELINES FOR ASSESSMENT OF STUDENT CENTRED ACTIVITIES (SCA)

It was discussed and decided that the maximum marks for SCA should be 30 as it involves a lot of subjectivity in the evaluation. The marks may be distributed as follows

10 Marks for general behavior and discipline

(by HODs in consultation with all the teachers of the department)

ii. 5 Marks for attendance as per following:

(by HODs in consultation with all the teachers of the department)

a) 75 - 80% 2 Marks

b) 80 - 85% 4 Marks

c) Above 85% 5 Marks

iii. 15 Marks maximum for Sports/NCC/Cultural/Co-curricular/ NSS activities as per following:

(by In-charge Sports/NCC/Cultural/Co-curricular/NSS)

a) 15 - State/National Level participation

b) 10 - Participation in two of above activities

c) 5 - Inter-Polytechnic level participation

Note: There should be no marks for attendance in the internal sessional of different subjects.

FIRST SEMESTER

1.1* COMMUNICATION SKILLS – I

L	T	P
4	-	2

RATIONALE

Knowledge of English Language plays an important role in career development. This subject aims at introducing basic concepts of communication besides laying emphasis on developing listening, speaking, reading and writing skills as parts of Communication Skill.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Understand the importance of effective communication
- Describe the process of communication
- Communicate effectively in different contexts
- Identify parts of speech
- Write correct sentences using appropriate vocabulary
- Reproduce and match words and sentences in a paragraph
- Write various types of paragraphs, notices for different purposes and composition on picture with appropriate format
- Read unseen texts with comprehension

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DETAILED CONTENTS

1 Basics of Communication (13 periods)

1.1 Definition and process of communication
1.2 Types of communication - formal and informal, oral and written, verbal and non-verbal
1.3 Communications barriers and how to overcome them
1.4 Barriers to Communication, Tools of Communication

2 Application of Grammar (18 periods)

2.1 Parts of Speech (Noun, verb, adjective, adverb) and modals
2.2 Sentences and its types
2.3 Tenses
2.4 Active and Passive Voice
2.5 Punctuation
2.6 Direct and Indirect Speech

3 Reading Skill (10 periods)

Unseen passage for comprehension (one word substitution, prefixes, suffixes, antonyms, synonyms etc. based upon the passage to be covered under this topic)

4 Writing Skill (15 periods)

4.1 Picture composition
4.2 Writing paragraph
4.3 Notice writing

LIST OF PRACTICALS

Note: Teaching Learning Process should be focused on the use of the language in writing reports and making presentations.
Topics such as Effective listening, effective note taking, group discussions and regular presentations by the students need to be taught in a project oriented manner where the learning happens as a byproduct.

Listening and Speaking Exercises

1. Self and peer introduction
2. Newspaper reading
3. Just a minute session-Extempore
4. Greeting and starting a conversation
5. Leave taking
6. Thanking
7. Wishing well
8. Talking about likes and dislikes
9. Group Discussion
10. Listening Exercises.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centered activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications, Chandigarh.
2. Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.
3. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.
4. Excellent General English- R.B.Varshnay, R.K. Bansal, Mittal Book Depot, Malhotra
5. The Functional aspects of Communication Skills – Dr. P. Prsad, S.K. Katria & Sons, New Delhi
6. Q. Skills for success – Level & Margaret Books, Oxford University Press.
7. e-books/ e-tools/ relevant software to be used as recommended by AICTE/ BTEUP/ NITTTR.

Websites for Reference:

1. http://www.mindtools.com/ page 8.html – 99k
2. http://www.letstalk.com.in
3. http://www.englishlearning.com
4. http://learnenglish.britishcouncil.org/en/
5. http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	13	24
2	18	32
3	10	16
4	15	28
Total	**56**	**100**

1.2 * APPLIED MATHEMATICS - I

L	T	P
5	-	-

RATIONALE

Contents of this course provide fundamental base for understanding elementary mathematics and their uses in solving engineering problems. Contents of this course will enable students to use basic mathematical function like logarithms, partial fractions, matrices and basic 2D, curves in solving various engineering problems of all fields.

LEARNING OUTCOMES

After undergoing this course, the students will be able to:

- Apply Binomial theorem to solve engineering problems
- Apply determinants properties and Crammer's rule to solve engineering problems
- Apply dot & cross product of vectors to find the solution of engineering problems
- Use complex numbers in various engineering problems
- Apply differential calculus and higher order to solve engineering problems
- Find velocity, acceleration, errors and approximation in engineering problems with application of derivatives.

DETAILED CONTENTS

1. Algebra -I (12 Periods)

   1.1 Series : AP and GP; Sum, nth term, Mean

   1.2 Binomial theorem for positive, negative and fractional index (without proof). Application of Binomial theorem.

   1.3 Determinants : Elementary properties of determinant of order 2 and 3, Multiplication system of algebraic equation, Consistency of equation, Crammer's rule

2. Algebra- II (12 Periods)

   2.1 Vector algebra : Dot and Cross product, Scaler and vector triple product.

   2.2 Complex number.
   Complex numbers, Representation, Modulus and amplitude Demoivre theorem, its application in solving algebraic equations, Mod. function and its properties..

3. Trigonometry (10 Periods)

3.1 Relation between sides and angles of a triangle : Statement of various formulae showing relationship between sides and angle of a triangle.

3.2 Inverse circular functions : Simple case only

4. Differential Calculus - I (18 Periods)

4.1 Functions, limits, continuity, - functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability.

4.2 Methods of finding derivative, Trigonometric functions, exponential function, Function of a function, Logarithmic differentiation, Differentiation of Inverse trigonometric function, Differentiation of implicit functions.

5. Differential Calculus - II (18 Periods)

5.1 Higher order derivatives, Leibnitz theorem (without proof). Simple applications.

5.2 Application - Finding Tangents, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, velocity, Acceleration, Errors and approximation.

INSTRUCTONAL STRATEGY

The basic instructional strategy to teach basic mathematics, Binomial theorem, trigonometry, differential equations etc. should be conceptual with real world applications of relevant branch. More numerical and theory examples can be used for clear understanding of the content**.**

MEANS OF ASSESSMENT

- Assignments and Quiz/Class Tests
- Mid-term and End-term Written Tests
- Model/Prototype Making

RECOMMENDED BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
3 Applied Mathematics-I by Chauhan and Chauhan, Krishna Publications, Meerut**.**
4. Applied Mathematics-I (A) by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut.

SUGGESTED DISTRIBUTION OF MARKS

Topic	Time Allotted (Periods)	Marks Allotted (%)
1.	12	20
2.	12	20
3.	10	12
4	18	24
5	18	24
Total	**70**	**100**

1.3 * APPLIED PHYSICS – I

L	T	P
5	-	2

RATIONALE

Applied physics includes the study of a diversified topics related to the world around us. It aims to give an understanding of this world both by observation and by prediction of the way in which objects behave. Concrete knowledge of physical laws, analysis and applications in various fields of engineering and technology are given prominence in this course content.

Note: Teachers should give examples of engineering/technology applications of various concepts and principles in each topic so that students are able to learn and appreciate these concepts and principles. In all contents, SI units should be followed.

LEARNING OUTCOMES

After undergoing this course, the students must be able to:

- Identify the use of S.I. system of measurement with accuracy and how it is used in engineering
- Represent physical quantities as scalars and vectors, applying the physical laws and concepts of linear and circular motion in everyday life.
- Solve difficult problems (walking of man, horse and cart problem, flying of bird/ aircraft, etc.)
- Analyse and design banking of roads/railway tracks and apply conservation of momentum principle to Explain rocket propulsion, recoil of gun etc.
- Derive work, power and energy relationship and solve problems about work and power.
- Define work, energy and power and their units.
- Describe conservation of energy and its applications
- Understand the concept of rotational motion of a rigid body and its applications
- Apply the physical laws and concepts of gravity, its variation with longitude and latitude and its uses in space satellite etc. .
- Understand the concept of elasticity, surface tension, pressure and the laws governing movement of fluids.
- Express physical work in term of heat and temperature; Measure temperature in various processes on different scales (Celsius, Kelvin, Fahrenheit etc.)
- Distinguish between conduction, convection and radiation, identify the different methods for reducing heat losses
- Understand the laws of thermodynamics, Carnot cycle and their applications.

DETAILED CONTENTS

1. Units and Dimensions (10 Periods)

1.1 Need of Measurement in engineering and science, unit of a physical quantities - fundamental and derived units, systems of units (FPS, CGS and SI units)

1.2 Dimensions and dimensional formulae of physical quantities.

1.3 Principle of homogeneity of dimensions

1.4 Dimensional equations and their applications, conversion of numerical values of physical quantities from one system of units into another, checking the correctness of physical equations and deriving relations among various physical quantities

1.5 Limitations of dimensional analysis

1.6 Error in measurement, accuracy and precision of instruments, random and systematic errors, absolute error, relative error, and percentage error, Estimation of probable errors in the results of measurement (combination of errors in addition, subtraction, multiplication, division and powers), rules for representing significant figures in calculation.

1.7 Application of units and dimensions in measuring length, diameter, circumference, volume, surface area etc. of metallic and non metallic blocks, wires, pipes etc (at least two each).

2. Force and Motion (10 periods)

2.1 Scalar and vector quantities – examples, representation of vector, types of vectors

2.2 Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only), Scalar and Vector Product.

2.3 Resolution of Vectors and its application to lawn roller.

2.4 Force, Momentum, Statement and Derivation of Conservation of linear momentum, its applications such as recoil of gun.

2.5 Impulse and its Applications

2.6 Circular motion (Uniform and Non-uniform), definition of angular displacement, angular velocity, angular acceleration, frequency, time period.

2.7 Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical)

2.8 Central force, Expression and Applications of Centripetal and centrifugal forces with examples such as banking of roads and bending of cyclist, Principle of centrifuge.

2.9 Application of various forces in lifts, cranes, large steam engines and turbines

3. Work, Power and Energy (10 periods)

3.1 Work: and its units, examples of zero work, positive work and negative work, conservative and non-conservative force,

3.2 Friction: modern concept, types, laws of limiting friction, Coefficient of friction and its Engineering Applications.

3.3 Work done in moving an object on horizontal and inclined plane for rough and plane surfaces with its applications

3.4 Energy and its units: Kinetic energy and potential energy with examples and their derivation, work energy theorem.

3.5 Principle of conservation of mechanical energy for freely falling bodies, examples of transformation of energy.

3.6 Power and its units, calculation of power in numerical problems

3.7 Application of Friction in brake system of moving vehicles, bicycle, scooter, car trains etc.

4 Rotational Motion (10 periods)

4.1 Concept of translator and rotator motions with examples

4.2 Definition of torque with examples

4.3 Angular momentum, Conservation of angular momentum (quantitative) and its examples

4.4 Moment of inertia and its physical significance, radius of gyration for rigid body, Theorems of parallel and perpendicular axes (statements only), Moment of inertia of rod, disc, ring and sphere (hollow and solid) (Formulae only). Concept of Fly wheel.

4.5 Rotational kinetic energy, Rolling of sphere on the slant plane,

4.6 Comparison of linear motion and rotational motion.

4.7 Application of rotational motions in transport vehicles, and machines.

5 Motion of planets and satellites (08 periods)

5.1 Gravitational force, Kepler's law of planetary motion,

5.2 Acceleration due gravity and its variation,

5.3 Gravitational Potential and Gravitational potential energy,

5.4 Motion of satellite, orbital velocity and time period of satellite, Total energy and Binding energy of a satellite, Escape energy and escape velocity,

5.5 Types of satellites, Geo-stationary satellite, semi-synchronous, polar satellite (concept only) and their uses in science and technology,

5.6 Concept of Black Holes

6. Properties of Matter (12 periods)

6.1 Elasticity: definition of stress and strain, different types of modulii of elasticity, Hooke's law, significance of stress strain curve

6.2 Pressure: definition, its units, atmospheric pressure, gauge pressure, absolute pressure, Fortin's Barometer and its applications

6.3 Surface tension: concept, its units, angle of contact, Capillary action and determination of surface tension from capillary rise method, applications of surface tension, effect of temperature and impurity on surface tension

6.4 Viscosity and coefficient of viscosity: Terminal velocity, Stoke's law and effect of temperature on viscosity, application in hydraulic systems.

6.5 Concept of fluid motion, stream line and turbulent flow, Reynold's number Equation of continuity, Bernoulli's Theorem and their applications.

7. Heat and Thermodynamics (10 periods)

7.1 Difference between heat and temperature

7.2 Modes of transfer of heat (Conduction, convection and radiation with examples)

7.3 Different scales of temperature and their relationship

7.4 Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them

7.5 Heat conduction in a metal rod, Temperature gradient, Concept of Co-efficient of thermal conductivity, Uses and effects of Heat conduction in Daily life.

7.6 Isothermal and Adibatic process

7.7 Zeroth, First and second law of thermodynamics, Heat engine (concept Only), Carnot cycle.

7.8 Application of various systems of thermometry in refrigeration and air-conditioning etc.

LIST OF PRACTICALS (to perform minimum six experiments)

1. To find radius of wire and its volume and the maximum permissible error in these quantities by using both vernier calipers and screw gauge.
2. To find the value of acceleration due to gravity on the surface of earth by using a simple pendulum.
3. To determine the Radius of curvature of (i) convex mirror, (ii) concave mirror by spherometer
4. To verify parallelogram law of forces
5. To study conservation of energy of a ball or cylinder rolling down an inclined plane.
6. To find the Moment of Inertia of a flywheel about its axis of rotation
7. To determine the atmospheric pressure at a place using Fortin's Barometer
8. To determine the viscosity of glycerin by Stoke's method
9. To determine the coefficient of linear expansion of a metal rod
10. To determine force constant of spring using Hooks law

INSTRUCTIONAL STATREGY

Teacher may use various teaching aids like live models, charts, graphs and experimental kits etc. for imparting effective instructions in the subject. The teacher should explain about field applications before teaching the basics to develop proper understanding of the physical phenomenon. Use of demonstration and animations can make the subject interesting and may develop scientific temper in the students. Teacher must plan a tour of Science Park/planetarium available in nearby areas in order to enhance the interest in this course.

MEANS OF ASSEMENTS

- Assignment & Quiz,
- Mid-Term and End-Term written test,
- Model Making,
- Actual Lab & Practical Work,
- Viva Voce

RECOMMENDED BOOKS

1 Text Book of Physics for Class XI (Part-I, Part-II); N.C.E.R.T., Delhi
2 Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
3 Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd., New Delhi
4 B.Sc.Practical Physics by C L Arora, S. Chand Publication..
5 Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
6 Engineering Physics by DK Bhhatacharya & Poonam Tandan; Oxford University Press, New Delhi
7 Modern Engineering Physics by SL Gupta, Sanjeev Gupta, Dhanpat Rai Publications
8 V. Rajendran,physics-I, Tata McGraw-Hill raw Hill publication, New Delhi
9 Arthur Beiser, Applied Physics, Tata McGraw-Hill raw Hill publication, New Delhi
10 Physics Volume 1, 5th edition, Haliday Resnick and Krane, Wiley publication

TOPIC WISE DISTRIBUTION OF PERIODS AND MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	10	15
2	10	15
3	10	15
4	10	15
5	08	10
6	12	16
7	10	14
Total	**70**	**100**

1.4 * APPLIED CHEMISTRY

L	T	P
5	-	2

RATIONALE

The use of various chemicals and chemical products in diverse technical and engineering fields have repeatedly proved the importance of Applied Chemistry, which enhances its role to a new peak. On the other hand, ever increasing use of such materials will compel engineers, technocrats to acquire essential applied chemistry knowledge in order to select engineering materials, which not only suit them but also provide more environmental compatibility. This situation demands principles of Applied Chemistry in diploma-engineering courses. Principles of Applied Chemistry will enable budding engineers and technocrats to develop scientific temper and appreciate physical, chemical and engineering properties of materials. Hence the subject of Applied Chemistry.

LEARNING OUTCOMES

After undergoing this subject, the student will be able to:

- Classify various substances based on state of aggregation
- Substantiate the laws and principles on which structure of atom is established.
- Explain and predict properties of substances.
- Explain sources of water and various characteristics of water (quantitatively).
- Explain cause and factors which can adversely affecting natural water quality and remedial measures available for water purification
- Think critically, develop and adapt water conservation techniques.
- Explain corrosion of metal and their preventive measures.
- explain chemical nature and causes of corrosion
- apply correct and efficient methods of corrosion prevention.
- explain chemistry of fuels and their relative advantages.
- select most efficient fuel for the engine and engineering applications.
- suggest how to subside air pollution caused by the use of fossil fuels
- explain the chemistry of various polymers and plastics
- verify suitability and select polymer/rubber/plastic materials for engineering applications.

DETAILED CONTENTS

1. Atomic Structure, Periodic Table and Chemical Bonding (14 periods)

1.1 Fundamental particles- mass and charges of electrons, protons and neutrons with names of the scientists who discovered these fundamental particles.

1.2 Bohr's model of atom and successes and limitations of atomic theory (qualitative treatment only).

1.3 Atomic number, atomic mass number isotopes and isobars.

1.4 Definition of orbit and orbital, shapes of s and p orbital's only, quantum numbers and their significance,

1.5 Aufbau's principle, Pauli's exclusion principle and Hund's rule electronic configuration of elements with atomic number (Z) = 30 only. (Electronic configurations of elements with atomic number greater than 30 are excluded).

1.6 Modern periodic law and periodic table, groups and periods, classification of elements into s, p, d and f blocks (periodicity in properties - excluded)

1.7 Chemical bonding and cause of bonding and types such as ionic bond in NaCl sigma (σ) and pi (π) covalent bonds in H_2, HCl, Cl_2, elementary idea of hybridization in $BeCl_2$, BF_3, CH_4, NH_3 and H_2O, VSEPR, Molecular orbital Theory

1.8 States of Matter: Solid, Liquid & Gas, Metallic bonding- explanation with the help of electron gas (sea) model.

2. Fuels and Lubricants (18 periods)

2.1 Definition of fuel, classification of fuels, characteristics of good fuel, relative merits of gaseous, liquid and solid fuels

2.2 Calorific value-higher calorific value, lower calorific value, determination of calorific value of solid or liquid fuel using Bomb calorimeter and numerical examples.

2.3 Coal - types of coal and proximate analysis of coal

2.4 Fuel rating – Octane number and Cetane number, fuel-structural influence on Octane and Cetane numbers

2.5 Gaseous fuels – chemical composition, calorific value and applications of natural gas (CNG), LPG, producer gas, water gas and biogas.

2.6 Elementary ideal on – hydrogen as future fuels, nuclear fuels.

2.7 Lubricants: Definition and properties, mechanism, industrial application and its function in bearings.

2.8 Synthetic lubricants and cutting fluids.

3. Water (14 periods)

3.1 Demonstration of water resources on Earth using pie chart.

3.2 Classification of water – soft water and hard water, action of soap on hard water, types of hardness, causes of hardness, units of hardness – mg per liter (mgL^{-1}) and part per million (ppm) and simple numerical, pH and buffer solutions and their applications.

3.3 Disadvantages caused by the use of hard water in domestic and boiler feed water. Priming and foaming and caustic embrittlement in boilers.

3.4 Removal of hardness -Permutit process and Ion-exchange process.

3.5 Physico-Chemical methods for Water Quality Testing

a) Determination of pH using pH meter, total dissolved solids (TDS)

b) Testing and Estimation of- alkalinity, indicator their types and application total hardness by EDTA method and O'Hener's Method. (chemical reaction of EDTA method are excluded).

c) Understanding of Indian Water Quality standards as per WHO

3.6 Natural water sterilization by chlorine and UV radiation and reverse osmosis.

3.7 Municipality waste water treatment. Definition of B.O.D and C.O.D.

4. Electrochemistry (4 periods)

Redox Reaction, Electrode Potential, Nernst equation, Electrochemical cell (Galvanic and Electrolytes); Nernst equation.

5. Corrosion and its Control (10 periods)

5.1 Definition of corrosion and factors affecting corrosion rate.

5.2 Theories of

a) Dry (chemical) corrosion- Pilling Bedworth rule

b) Wet corrosion in acidic atmosphere by hydrogen evolution mechanism

5.3 Definition of passivity and galvanic series

5.4 Corrosion control:

a) Metal coatings – Cathodic protection, Cementation on Base Metal Steel –Application of Metal Zn (Sheradizing),Cr (Chromozing) and Al (Calorizing), Sacrificial protection and impressed current voltage

b) Inorganic coatings – Anodizing and phosphating,

c) Organic coatings - use of paints varnishes and enamels

d) Internal corrosion preventive measures- alloying (with reference to passivating, neutralizing and inhibition) and heat treatment (quenching, annealing)

6. Organic compounds, Polymers and Plastics (10 periods)

6.1 Classification of organic compounds and IUPAC Nomenclature
6.2 Definition of polymer, monomer and degree of polymerization
6.3 Brief introduction to addition and condensation polymers with suitable examples (PE, PS, PVC, Teflon, Nylon -66 and Bakelite)
6.4 Definition of plastics, thermo plastics and thermo setting plastics with suitable examples, distinctions between thermo and thermo setting plastics
6.5 Applications of polymers in industry and daily life

LIST OF PRACTICALS

1. Estimation of total hardness of water using standard EDTA solution
2. Estimation of total alkalinity of given water sample by titrating it against standard sulfuric acid solution
3. Proximate analysis of solid fuel)
4. Estimation of temporary hardness of water sample by O' Hener's Method.
5. Determination of flash and fire point of given lubricating oil using Able's flash point apparatus

INSTRUCTIONAL STRATEGY

Teachers may take help of various models and charts while imparting instructions to make the concept clear. More emphasis should be laid on discussing and explaining practical applications of various chemical process and reactions. In addition, students should be encouraged or motivated to study those processes in more details, which may find practical application in their future professional career.

MEANS OF ASSESMENTS

- Assignment & Quiz,
- Mid-Term and End-Term written test,
- Model Making,
- Actual Lab & Practical Work,
- Viva-Voce

RECOMMENDED BOOKS

1. Chemistry in Engineering by J.C. Kuricose & J. Rajaram, Tata McGraw Hill, Publishing Company Limited, New Delhi.
2. Engineering Chemistry by P.C. Jain & Monika Jain, Dhanapat Rai Publishing Company, New Delhi.
3. Eagle's Applied Chemistry - I by S. C. Ahuja & G. H. Hugar, Eagle Prakashan, Jalandhar.
4. Engineering Chemistry – A Text Book by H. K. Chopra & A. Parmar, Narosa Publishing House, New Delhi.
5. Applied Chemistry - I by Dr. P. K Vij & Shiksha Vij, Lords Publications, Jalandhar.
6. Engineering Chemistry by Dr. Himanshu Pandey, Goel Publishing House, Meerut, India

SUGGESTED DISTRIBUTION OF MARKS

Topics	Time Allotted (hrs)	Marks Allotted (%)
1.	14	20
2.	18	24
3.	14	20
4.	4	6
5.	10	15
6.	10	15
Total	**70**	**100**

1.5 GRAPHIC PRESENTATION AND ART

L	T	P
5	-	8

RATIONALE

Graphic presentation and Art is considered to be the language of Engineers and Architects, which is a means of communication among the designers, engineers, technicians, architects & draftsmen engaged in the field of construction of buildings. The translation of ideas into practice with the use of this graphic language is beyond imagination. Thus, for effective and efficient communication among all those involved in the system, it becomes necessary that the personal working in different capacities acquire appropriate skills in the use of this graphic language. The paper aims at fulfilling the need.

LEARNING OUTCOMES

After completing the course, the students will be able to:

- Identify Drawing tools and Mediums used and their respective functions.
- Identify different types of materials used in making models and their basic properties.
- Developing art and sketching skills of live objects, buildings and landscapes.
- Developing a visual literacy about our surroundings.
- Effectively using the various measurement systems on the drawing.
- Learning and Writing various Font Styles in an effective manner.
- Develop a sense of Co-relation between Actual size and the drawn sketch.
- To develop an art of visualizing 3-D objects through their 2-D drawings and projections
- Prepare simple Plans and Elevations of one room structures.
- Using various mediums of presentation for sketching and drawings.

TOPIC WISE DISTRIBUTION OF PERIODS

SL. No.	Topic	L	T	P
1.	Lettering & Scales	6	-	14
2.	Graphic Presentation	14	-	24
3.	Development of Surfaces	8	-	10
4.	Isometric Projections	8	-	10
5.	Architectural Drawing	10	-	16
6.	Rendering	8	-	16
7.	Art	16	-	22
		70	-	112

DETAILED CONTENTS

1. LETTERING & SCALES:

   Lettering in pencil & ink in the following style. (Roman, Gothic, Block, italic & free hand lettering). Plain and Diagonal Scale.

2. GRAPHIC PRESENTATION:

   Exercise in graphic presentation of solid forms through their plan, elevation and section (Solid forms involving cube, prism, pyramid, cylinder, cone, sphere.), Polygons and their frustums.

3. DEVELOPMENT OF SURFACES:

   Development of surfaces of the above solids.

4. ISOMETRIC PROJECTIONS:

   Isometric & axonometric projection of simple blocks of wood & metal, which is having simple cuts & shapes.

5. ARCHITECTURAL DRAWING:

   Basic concepts of preparing architectural drawing involving house hold furniture for Drawing, Dining & Bed rooms, studio stools, tables.

6. RENDERING:

   Rendering techniques in colour & ink, in order to develop the skills of presentation and to visualise forms in space.

   (a) The drawing of any sketch to be given, to render in colour, pencil and ink ; with emphasis on shades and shadows in same size or after enlarging / reducing.

   (b) Arrangement of geometrical forms within the given space or area ; to be finished in various colours or tints of a colour.

   (c) Stippling in ink to create effects of 3 dimensions and shadows etc.
   (Geometrical forms which are to be involved ; square, rectangle, circle and triangle.)

7. ART:

Orientation exercise in different mediums in Pencil, Ink, Water colours, Pastels, etc. Theory of composition, theory of colours Drawing indoor and out door sketching in pencil and ink.

The portion dealing with Art should include simple designing and study of human forms, Anthropometric studies, etc.

MODEL EXERCISES OF ART :

Should be given on -

- Collage Making
- Architectural Theme based Art Work
- Murals by using various materials
- Making of illusions
- Making of sculptures

INSTRUCTIONAL STRATEGY

- Student should be encouraged to draw minimum of 2 sketches in their sketch book from the surroundings on every calendar day.
- They should be encouraged to make sculptures to understand the 3-D forms and the Scale of objects with reference to humans and the buildings.

This is a practical oriented subject. Teacher should arrange visits to some of Model rooms of important buildings. Each student should be given independent exercises to make models. Teacher may procure me models of some residential, group housing, commercial and public buildings made from different materials and demonstrate to the students

MEANS OF ASSESSMENT

– Assignments and class tests, mid-semester and end-semester written tests
– Actual sketching and drawing work, exercises done on drawing sheets and the sketch book.
– Presentation in pencil , ink , colour and other mediums.

RECOMMENDED BOOKS

1. Engineering Drawing by N.D. Bhatt; Publisher Charotar Publishing House Pvt. Ltd., New Delhi

2. Engineering Drawing by G.S. Virdhi; Khanna Publisher, New Delhi

3. Building Construction by Sikka; Publisher Tata McGraw Hill Publisher, New Delhi

4. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera Published by Mc Graw Hill, New Delhi

5. Rendering with Pencil and Ink by Gill Robert W., Published by Thomos and Hudson, New Delhi

6. Architects Data by Neufert, Published by Oxford BSP Professional Books, New Delhi
7. Architecture: Form, Space and Order by D.K. Ching

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	18	10
2	36	24
3	16	8
4	16	8
5	24	14
6	24	14
7	34	22
Total	**168**	**100**

1.6 *GENERAL WORKSHOP PRACTICE – I

(Common with Civil Engineering, Electrical Engineering and Chemical Engineering)

L	T	P
-	-	8

RATIONALE

In order to have a balanced overall development of diploma engineers, it is necessary to integrate theory with practice. General workshop practices are included in the curriculum in order to provide hands-on experience about use of different tools and basic manufacturing practices. This subject aims at developing general manual and machining skills in the students. In addition, the development of dignity of labour, safety at work place, team working and development of right attitude are the other objectives.

LEARNING OUTCOMES

After completing the course, the students will be able to:

- Identify tools and equipment used and their respective functions.
- Identify different types of materials and their basic properties.
- Use and take measurements with the help of basic measuring tools/equipment.
- Select proper tools for a particular operation.
- Select materials, tools, and sequence of operations to make a job as per given specification/drawing.
- Prepare simple jobs independently and inspect the same.
- Follow safety procedures and precautionary measures.
- Use safety equipment and Personal Protection Equipment.

DETAILED CONTENTS (PRACTICAL EXERCISES)

Note: The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced. The students should prepare sketches of various tools/jobs in their practical Notebook.

The following shops are included in the syllabus:

1. Carpentry Shop
2. Painting and Polishing Shop
3. Electrical Shop
4. Welding Shop
5. Plumbing Shop

1. CARPENTRY SHOP

1.1 General Shop Talk

1.1.1 Name and use of raw materials used in carpentry shop : wood & alternative materials

1.1.2 Names, uses, care and maintenance of hand tools such as different types of Saws, C-Clamp, Chisels, Mallets, Carpenter's vices, Marking gauges, Try-squares, Rulers and other commonly used tools and materials used in carpentry shop by segregating as cutting tools, supporting tools, holding tools , measuring tools etc.

1.1.3 Specification of tools used in carpentry shop.

1.1.4 Different types of Timbers, their properties, uses & defects.

1.1.5 Seasoning of wood.

1.2. Practice

1.2.1 Practices for Basic Carpentry Work

1.2.2 Sawing practice using different types of saws

1.2.3 Assembling jack plane — Planning practice including sharpening of jack plane cutter

1.2.4 Chiseling practice using different types of chisels including sharpening of chisel

1.2.5 Making of different types of wooden pin and fixing methods. Marking measuring and inspection of jobs.

1.3 Job Practice

Job 1	Marking, sawing, planning and chiseling and their practice
Job II	Half Lap Joint (cross, L or T – any one)
Job III	Mortise and Tenon joint (T-Joint)
Job IV	Dove tail Joint (Lap or Bridle Joint)

1.4. Demonstration of job showing use of Rip Saw, Bow saw and Tenon saw, method of sharpening various saws.

2. PAINTING AND POLISHING SHOP

2.1. Introduction of paints, varnishes, Reason for surface preparation, Advantages of Painting, other method of surface coating ie. Electroplating etc.

2.2. Job Practice

Job 1: To prepare a wooden surface for painting apply primer on one side and to paint the same side. To prepare french polish for wooden surface and polish the other side.

Job II: To prepare metal surface for painting, apply primer and paint the same.

Job III: To prepare a metal surface for spray painting, first spray primer and paint the same by spray painting gun and compressor system.

The sequence of polishing will be as follows:

i) Abrasive cutting by leather wheel
ii) Polishing with hard cotton wheel and with polishing material
iii) Buffing with cotton wheel or buff wheel.

3. ELECTRICAL SHOP

3.1 Study, demonstration and identification of common electrical materials with standard ratings and specifications such as wires, cables, switches, fuses, cleats, clamps and allied items, tools and accessories.

3.2 Study of electrical safety measures and protective devices.

Job I Identification of phase, Neutral and Earth wires for connection to domestic electrical appliances and their connections to three pin plugs.

Job II Carrying out house wiring circuits using fuse, switches, sockets, ceiling rose etc. in batten or P.V.C. casing-caping.

3.3 Study of common electrical appliances such as auto electric iron, electric kettle, ceiling/table fan, desert cooler etc.

3.4 Introduction to the construction of lead acid battery and its working.

Job III Installation of battery and connecting two or three batteries in series and parallel.

3.5 Introduction to battery charger and its functioning.

Job IV Charging a battery and testing with hydrometer and cell tester

4. WELDING SHOP

4.1 Introduction and importance of welding as compared to other material joining processes. Specifications and type of welding machines, classification and coding of electrodes, welding parameters, welding joints and welding positions. Materials to be welded, safety precautions.

4.2 Job Practice

Job I	Practice of striking arc (Minimum 4 beads on 100 mm long M.S. flat).
Job II	Practice of depositing beads on plate at different current levels. (Minimum 4 beads on M.S. plate at four setting of current level).
Job III	Preparation of lap joint using arc welding process.
Job IV	Preparation of T-joint using gas welding or arc welding on 100 mm x 6 mm MS Flat

5. PLUMBING SHOP

5.1. Use of personal protective equipments, safety precautions while working and cleaning of shop.

5.2. Introduction and demonstration of tools, equipment and machines used in plumbing shop.

5.3. Introduction of various pipes and pipe fittings of elbow, nipple, socket, union etc.

5.4. Job Practice

Job 1 : Preparation of job using elbow, bend and nipple

Job II: Preparation of job using Union, Tap, Plug and Socket.

Job III: Threading practice on pipe with die

MEANS OF ASSESSMENT

- Workshop jobs
- Report writing, presentation and viva-voce

RECOMMENDED BOOKS

1. Workshop Technology I,II,III, by SK Hajra, Choudhary and AK Choudhary; Media Promoters and Publishers Pvt. Ltd. Mumbai.
2. Workshop Technology Vol. I, II, III by Manchanda; India Publishing House, Jalandhar.
3. Workshop Training Manual Vol. I, II by S.S. Ubhi; Katson Publishers, Ludhiana.
4. Manual on Workshop Practice by K Venkata Reddy; MacMillan India Ltd., New Delhi
5. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
6. Workshop Technology by B.S. Raghuwanshi; Dhanpat Rai and Co., New Delhi
7. Workshop Technology by HS Bawa; Tata McGraw Hill Publishers, New Delhi.

SECOND SEMESTER

2.1 *APPLIED MATHEMATICS - II

L	T	P
5	-	-

RATIONALE

Basic elements of integral calculus, differential calculus, numerical methods, differential m equations included in this course will play a vital role in understanding engineering problem mathematically. This will also develop analytical as well as conceptual abilities among students.

LEARNING OUTCOMES

After undergoing this course, the students will be able to:

- Calculate simple integration by methods of integration
- Evaluate the area under curves, surface by using definite integrals.
- Calculate the area and volume under a curve along areas
- Solve the engineering problems with numerical methods.
- Understand the geometric shapes used in engineering problems by co-ordinate geometry.

DETAILED CONTENTS

1. Integral Calculus - I (20 Periods)

   Methods of Indefinite Integration :-

   1.1 Integration by substitution.
   1.2 Integration by rational function.
   1.3 Integration by partial fraction.
   1.4 Integration by parts.
   1.5 Integration of special function

2. Integral Calculus - II: (20 Periods)

   2.1 Meaning and properties of definite integrals, Evaluation of definite integrals..

   2.2 Application : Length of simple curves, Finding areas bounded by simple curves Volume of solids of revolution, centre of mean of plane areas.

   2.3 Simposns 1/3rd and Simposns3/8th rule and Trapezoidal Rule : their application in simple cases. Numerical solutions of algebraic equations; Bisections method, Regula-Falsi method, Newton-Raphson's method(without proof), Numerical solutions of simultaneous equations; Gauss elimination method(without proof)

3. Co-ordinate Geometry (2 Dimension) (18 Periods)

3.1 Circle

Equation of circle in standard form. Centre - Radius form, Diameter form, Two intercept form.

4. Co-ordinate Geometry (3 Dimension) (12 Periods)

4.1 Straight lines and planes in space

Distance between two points in space, direction cosine and direction ratios, Finding equation of a straight line (without proof)

INSTRUCTONAL STRATEGY

Basic elements of Differential Calculus, Integral Calculus and differential equations can be taught conceptually along with real engineering applications in which particular algorithm and theory can be applied. Numerical examples will be helpful in understanding the content of the subject.

MEANS OF ASSESSMENT

- Assignments and Quiz/Class Tests
- Mid-term and End-term Written Tests
- Model/Prototype Making

RECOMMENDED BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
3 Applied Mathematics-II by Chauhan and Chauhan, Krishna Publications, Meerut.
4. Applied Mathematics-I (B) by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut

SUGGESTED DISTRIBUTION OF MARKS

Topic	Time Allotted (Periods)	Marks Allotted (%)
1.	20	28
2.	20	28
3.	18	24
4	12	20
Total	**70**	**100**

2.2 *APPLIED MECHANICS

L	T	P
5	-	2

RATIONALE

The subject Applied Mechanics deals with basic concepts of mechanics like laws of forces, moments, friction, centre of gravity, laws of motion and simple machines which are required by the students for further understanding of other allied subjects. The subject enhances the analytical ability of the students.

LEARNING OUTCOMES

After undergoing this course, the students will be able to:

- Interpret various types of units and their conversion from one to another.
- Analyze different types of forces acting on a body and draw free body diagrams.
- Determine the resultant of coplanar concurrent forces.
- Calculate the co-efficient of friction for different types of surfaces.
- Calculate the least force required to maintain equilibrium on an inclined plane.
- Determine the centroid / centre of gravity of plain and composite laminar and solid bodies.
- Determine velocity ratio, mechanical advantage and efficiency of simple machines

DETAILED CONTENTS

1. Introduction (06 periods)

    1.1 Concept of engineering mechanics definition of mechanics, statics, dynamics, application of engineering mechanics in practical fields. Definition of Applied Mechanics.

    1.2 Definition, basic quantities and derived quantities of basic units and derived units

    1.3 Different systems of units (FPS, CGS, MKS and SI) and their conversion from one to another for density, force, pressure, work, power, velocity, acceleration

    1.4 Concept of rigid body, scalar and vector quantities

2. Laws of forces (12 periods)

    2.1 Definition of force, measurement of force in SI units, its representation, types of force: Point force/concentrated force & Uniformly distributed force, effects of force, characteristics of a force

2.2 Different force systems (coplanar and non-coplanar), principle of transmissibility of forces, law of superposition

2.3 Composition and resolution of coplanar concurrent forces, resultant force, method of composition of forces, laws of forces, triangle law of forces, polygon law of forces - graphically, analytically, resolution of forces, resolving a force into two rectangular components

2.4 Free body diagram

2.5 Equilibrant force and its determination

2.6 Lami's theorem (concept only)

[Simple problems on above topics]

2.7 Type of Load, supports, Beams- analysis for simply supported, cantilever beams

3. Moment (14 periods)

3.1 Concept of moment

3.2 Moment of a force and units of moment

3.3 Varignon's theorem (definition only)

3.4 Principle of moment and its applications (Levers – simple and compound, steel yard, safety valve, reaction at support)

3.5 Parallel forces (like and unlike parallel force), calculating their resultant

3.6 Concept of couple, its properties and effects

3.7 General conditions of equilibrium of bodies under coplanar forces

3.8 Position of resultant force by moment

[Simple problems on the above topics]

4. Friction (14 periods)

4.1 Definition and concept of friction, types of friction, force of friction

4.2 Laws of static friction, coefficient of friction, angle of friction, angle of repose, cone of friction

4.3 Equilibrium of a body lying on a horizontal plane, equilibrium of a body lying on a rough inclined plane.

4.4 Calculation of least force required to maintain equilibrium of a body on a rough inclined plane subjected to a force:

a) Acting along the inclined plane Horizontally

b) At some angle with the inclined plane

5. Centre of Gravity (10 periods)

5.1 Concept, definition of centroid of plain figures and centre of gravity of symmetrical solid bodies

5.2 Determination of centroid of plain and composite lamina using moment method only, centroid of bodies with removed portion

5.3 Determination of center of gravity of solid bodies - cone, cylinder, hemisphere and sphere; composite bodies and bodies with portion removed [Simple problems on the above topics]

6. Simple Machines (14 periods)

6.1. Definition of effort, velocity ratio, mechanical advantage and efficiency of a machine and their relationship, law of machines

6.2. Simple and compound machine (Examples)

6.3. Definition of ideal machine, reversible and self locking machine

6.4. Effort lost in friction, Load lost in friction, determination of maximum mechanical advantage and maximum efficiency

6.5. System of pulleys (first, second, third system of pulleys), determination of velocity ratio, mechanical advantage and efficiency

6.6. Working principle and application of wheel and axle, Weston's Differential Pulley Block , simple screw jack, worm and worm wheel, single and double winch crab. Expression for their velocity ratio and field of their application [Simple problems on the above topics]

LIST OF PRACTICALS

1. Verification of the polygon law of forces using gravesend apparatus.
2. To verify the forces in different members of jib crane.
3. To verify the reaction at the supports of a simply supported beam.
4. To find the mechanical advantage, velocity ratio and efficiency in case of an inclined plane.
5. To find the mechanical advantage, velocity ratio and efficiency of a screw jack.
6. To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel.
7. To find mechanical advantage, velocity ratio and efficiency of single purchase crab.
8. To find out center of gravity of regular lamina.
9. To find out center of gravity of irregular lamina.
10. To determine coefficient of friction between three pairs of given surface.

INSTRUCTIONAL STRATEGY

Applied Mechanics being a fundamental subject, the teacher are expected to emphasize on the application of "Applied Mechanics" in various subjects so that students are able to appreciate the importance of the subject. Students should also be made conversant with the use of scientific calculator to solve numerical problems

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Mid and end-term written tests
- Model/prototype making.
-

RECOMMENDED BOOKS

1. A Text Book of Applied Mechanics by S Ramamurtham, Dhanpat Rai Publishing Co. Ltd.
2. A Text Book of Engineering Mechanics (Applied Mechanics) by RK Khurmi; S Chand and Co. Ltd., New Delhi.
3. A Text Book of Applied Mechanics by RK Rajput; Laxmi Publications, New Delhi..
4. Text Book of Applied Mechanics by Birinder Singh, Kaption Publishing House, New Delhi.
5. Test Book of Applied Mechanics by AK Upadhya, SK Kataria & Sons, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Pds)	Marks Allotted (%)
1	06	8
2	12	18
3	14	20
4	14	20
5	10	14
6	14	20
Total	**70**	**100**

2.3 *BASICS OF INFORMATION TECHNOLOGY

L	T	P
-	-	6

RATIONALE

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools using MS Office/Open Office/Libre Office using internet etc., form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

Note:

Explanation of Introductory part should be demonstrated with practical work. Following topics may be explained in the laboratory along with the practical exercises. There will not be any theory examination.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Identify Computer Hardware Components, Network Components and Peripherals.
- Explain the role of an Operating System.
- Install System and Application Software.
- Explain the function of the system components including Processor, Motherboard and Input-output devices.
- Use Word Processing Software to prepare document.
- Use Spreadsheet Software to create workbooks and automate calculation.
- Use Presentation Software to create interactive presentation.
- Perform fundamental tasks common to most application software including print, scan, save, edit, cut, copy, paste, format, spell and grammar check.
- Find and evaluate information on the Web.
- Install Antivirus.
- Safeguard against Online Frauds, threats and crimes.
- Use online office tools(Google suits)

TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION

1. Introduction to Computers and Peripherals.

   Components of Computer, Types of Computer, CPU, RAM, ROM, Hard disk, USB, Flash drive, CD, DVD,Blue ray, Keyboard, Mouse, Monitor, LCD, Printer, Plotter, Scanner, Modem, Sound Cards, Speakers, CMOS battery, Sharing of Printers.

2. Operation System and Application Software

   System Software, Application Software, Virtualization Software, Utility Software, MS Office/Open Office/ Libre office, Working with window, Desktop components, Menu bars, creating shortcut of program. Installation of Application software , Antivirus and Drivers.

3. Word Processing, Spreadsheet and Presentation

   Usage and creation of word document, spreadsheets and presentation, Google Suits (Google drive, google sheet, google doc. Google presentation)

.

4. Internet

   Basics of Networking – LAN, WAN, Wi-Fi technologies, Concept of IP Addrsses, DNS, Search Engines, e-mail, Browsing and cyber laws.

LIST OF PRACTICAL EXERCISES

1. Identify various components, peripherals of computer and list their functions.
2. Installation of various application software and peripheral drivers
3. Installation of operating system (windows/linux/others)
4. Creation and Management (Rename, delete, search of file and folders)
5. Installation of Antivirus and remove viruses
6. Scanning and printing documents
7. Browsing, Downloading, Information using Internet
8. E-Mail ID creation, comparing, sending and receiving e-mail. Attaching a file with e-mail message.
9. Word Processing (MS Office/Open Office)
   a) File Management

- Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, giving password protection for a file

b) Page set up
- Setting margins, tab setting, ruler, indenting

c) Editing a document
- Entering text, cut, copy, paste using tool- bars

d) Formatting a document
- Using different fonts, changing font size and colour, changing the appearance through bold/italic/underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods
- Aligning of text in a document, justification of document, inserting bullets and numbering
- Formatting paragraph, inserting page breaks and column breaks, line spacing
- Use of headers, footers: Inserting footnote, end note, use of comments, autotext
- Inserting date, time, special symbols, importing graphic images, drawing tools

e) Tables and Borders
- Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table
- Print preview, zoom, page set up, printing options
- Using find, replace options

f) Using Tools like
- Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelops and lables
- Using shapes and drawing toolbar,
- Working with more than one window .

10. Spread Sheet Processing (MS Office/Open Office/Libre Office)

a) Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, save worksheet, switching between different spread sheets

b) Menu commands:
Create, format charts, organise, manage data, solving problem by analyzing data. Programming with Excel Work Sheet, getting information while working

c) Work books:

Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations

Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet, conditional formatting

d) Creating a chart:

Working with chart types, changing data in chart, formatting a chart, use chart to analyze data

Using a list to organize data, sorting and filtering data in list

e) Retrieve data with query:

Create a pivot table, customizing a pivot table. Statistical analysis of data

f) Exchange data with other application:

Embedding objects, linking to other applications, import, export document.

11. PowerPoint Presentation (MS Office/Open Office/Libre office)

a) Introduction to PowerPoint
   - How to start PowerPoint
   - Working environment: concept of toolbars, slide layout & templates.
   - Opening a new/existing presentation
   - Different views for viewing slides in a presentation: normal, slide sorter.

b) Addition, deletion and saving of slides

c) Insertion of multimedia elements
   - Adding text boxes
   - Adding/importing pictures
   - Adding movies and sound
   - Adding tables and charts etc.
   - Adding organizational chart
   - Editing objects
   - Working with Clip Art

d) Formatting slides
   - Using slide master
   - Text formatting
   - Changing slide layout
   - Changing slide colour scheme
   - Changing background
   - Applying design template

12. Google Suits
    Using Google drive, Google shut, Google docs, Google slides.

INSTRUCTIONAL STRATEGY

Since this subject is practice oriented, the teacher should demonstrate the capabilities of computers to students while doing practical exercises. The students should be made familiar with computer parts, peripherals, connections and proficient in making use of MS Office/Open Office/Libre office/Google Suit in addition to working on internet. The student should be made capable of working on computers independently.

MEANS OF ASSESSMENT

- Class Tests/Quiz
- Software Installation and Use
- Viva-Voce
- Presentation

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi
3. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
4. Computers Today by SK Basandara, Galgotia publication Pvt Ltd. Daryaganj, New Delhi.
5. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
6. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
8. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
9. On Your Marks - Net…Set…Go… Surviving in an e-world by Anushka Wirasinha, Prentice Hall of India Pvt. Ltd., New Delhi
10. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar

Reference websites

1. www. tutorialspoint..com
2. www.sf.net
3. Gsuite.google.com
4. Spoken-tutorial.org
5. Swayam.gov.in

2.5 ARCHITECTURAL DESIGN-A
(Basic Design)

L	T	P
4	-	8

RATIONALE

Basic Design of Architecture is the foundation and first step for the beginners, who enter the field of Architecture. It deals with theory of elements of architecture like form, graphics, composition, texture, colour, balance, etc. It is expected that the subject will fulfill the need.

TOPIC WISE DISTRIBUTION OF PERIODS

SL.No.	Topic	L	T	P
1.	Basic Design	12	-	16
2.	Introduction To Architectural Design			
	A. Theory	16	-	32
	B. Design	16	-	32
	C. Model	12	-	32
		56	-	112

DETAILED CONTENTS

1. BASIC DESIGN :

ORIENTATION TO THE ARCHITECTURE PROFESSION :

Role of an architect in the built environment as well as other professional (since history to present day),
Introduction towards Architects Act-1972, C.O.A., I.I.A., NASA.

UNDERSTANDING OF FUNDAMENTALS (SPACE AND ARCHITECTURE):

Understanding of General Design Principals and Elements of design through simple drawings and sketching of objects available in nature and surroundings.

2. INTRODUCTION TO ARCHITECTURAL DESIGN :

A. THEORY :

FORM AND TRANSFORMATIONS :

Additive, dimensional subtractive exercises primarily through 3-D models of simple geometry.

ORDER IN ARCHITECTURE :

Geometrical, structural, dimensional, material, spatial orders through observation of surroundings as well as simple exercises in 2D and 3D.

ANTHROPOMETRY:

Introduction to human dimensions and functions in different posture through measured drawing of a class room, hostel room etc (Basic activities only).

STRUCTURES SYSTEMS :

Introduction of different types of structures i.e. trabeated, arcaded, vector active, form active and tensile through showing examples.

B. DESIGN :

DESIGN PROBLEMS :

Show examples to create forms, understanding of different types of space including circulation in a residence, office and school

Design of small simple structures like milk booth, bus stop / petrol pump, small shop, exhibition gate, hostel room etc.

C. MODEL :

MODEL MAKING EXERCISES :

Block models to explain 3-D-effects of a building block; shall be prepared by the students, for which the tools and materials etc. will be provided from the institution's workshop.

INSTRUCTIONAL STRATEGY

- Drawing and model making skill will be taught along with the subject to improve the abilities to understand space and form.
- Teachers, while imparting instructions, are expected to teach various elements used in designing buildings, They may make use of models and audio-visual aids to clarify the concepts. Group discussion and seminars may also be organised to discuss various concepts and principles involved in the design.

It is recommended that they may organize visits to working sites to clarify the concepts and principles.

- This is a practical oriented subject. Teacher should arrange visits to some of Model rooms of important buildings. Each student should be given independent exercises to make models. Teacher may procure some models of residential, group housing, commercial and public buildings made from different materials and demonstrate to
the students.

MEANS OF ASSESSMENT

– Assignments and class tests, mid-semester and end-semester written tests
– Conceptual drawings, Flow diagram sketches and drawing work, exercises done on drawing sheets and the sketch books etc.
– Presentation in pencil , ink , colour and other mediums.
– Presentation with block models and semi-detailed models.

RECOMMENDED BOOKS

1. Time Saver Standard for landscape architecture: Design and construction by Charles W.Harris Published by Mc Graw-Hills Publishers, New Delhi

2. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera Published by Mc Graw Hill, New Delhi

3. Architects Data by Neufert, Published by Oxford BSP Professional Books, New Delhi
4. Architecture: Form, Space and Order by D.K. Ching

5. Architectural Aesthetics by Sangeet Sharma, Abhishek Publication, 57-59, Sector 17, Chandigarh

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	28	10
2A	48	35
2B	52	40
2C	40	15
Total	**168**	**100**

2.5 CONSTRUCTION & MATERIALS- I

(The Study of Constituents, Properties, Uses & Application)

L	T	P
3	-	4

RATIONALE

The subject deals with the properties and uses of different elementary building materials like brick, stone, timbers etc. and the construction principles of various components of buildings like foundation, masonry, lintels, etc. The knowledge of working materials is a must for a designer. The paper aims at fulfilling the need.

TOPIC WISE DISTRIBUTION OF PERIODS

SL.No.	Topic	L	T	P
1.	Elementary Building Materials	6	-	-
2.	Timber	6	-	-
3.	Construction	8	-	-
4.	Brick Foundation and D.P.C.	8	-	-
5.	Arches & Lintels	4	-	-
6.	Doors & Windows	4	-	-
7.	Types of Roof	6	-	-
		42		56

DETAILED CONTENTS

1. ELEMENTRY BUILDING MATERIALS:

   Brick, Stone, Lime, Cement and Concrete.

2. TIMBER:

   Defects and decay, seasoning preservation and different varieties of Timber.

3. CONSTRUCTION:

   Elements of Building :

   Terminology, Nomenclature of various parts of building from foundation of roof which support to making a complete wall section from foundation of parapet.

General principles of construction in brick toothing, brick on edge and brick on end etc., Bats and closers , Bonds in Brick work, stretching bond, English bond, double and single Flemish Bonds etc. in different types of mortars.

4. BRICK FOUNDATIONS & D.P.C. :

Definition and purpose of foundations, Introduction to different types of foundations. Timbering to trenches for foundations. Study of simple strip foundations for load bearing walls and piers, method of laying D. P. C..

5. ARCHES & LINTELS:

Definition & terms used in Arches, construction of Arches in brick and stone. Different types of lintels.

6. DOORS & WINDOWS:

Introduction to joints in carpentry and various types of doors & window, construction of door / window frames.
Introduction of Batten doors, Ledged and batten doors and Ledged, Braced and batten doors, Details of Paneled doors and Flush doors. Details of hardware related to these doors.

7. TYPES OF ROOF:

Introduction to different types of roofs roof covering with their suitability to various functions e.g. flat, couple, close couple, Lean to and double lean to roof. Roof coverings with thatch, slate and tile.

LIST OF PRACTICALS:

1. Identification of different types of building materials.

2. Different types of bonds in brick masonry.

The studio and workshop periods are devoted to the solution of simple construction problems and details.

Note: Total minimum of 10 sheets to be assigned.

INSTRUCTIONAL STRATEGY

This subject is of practical in nature. While imparting instruction for preparation of various drawings of different types of buildings and their components, the teacher should organize demonstration and field/site visits to show various stages, sizes and scales of operations involved in building construction. The teacher should involve the theoretical aspects of the instructions to the students before drawings are attempted by the students. Students may prepare the port-folio of the work done by them throughout the session. Teacher may also organize viva-voce after each drawing assignment so as to test the level of understanding of the students about underlying concepts, principles, and procedures.

Teachers may also arrange some field visits to manufacturing/ production units and retailer shops like cement, kilns, timber saw mills and seasoning plants, hardware shops, glass houses etc. Students should be encouraged to collect samples of various materials and catalogues of manufacturer. The students may maintain a scrapbook for this purpose. A museum of building construction, materials may be developed where samples of latest materials their specifications, characteristics, rates, manufacturer (supplier and relevant codes may be kept) to enhance the level of understanding of the students

RECOMMENDED BOOKS

1. Building Construction by WB Mckay; Longman Publication, Khanna Publisher, New Delhi
2. Building Construction by SP Bindra and SP Arora; publisher Dhanpat Rai & Co. New Delhi
3. Building Construction by BC Punmia; Publisher Laxmi Publication, New Delhi
4. Building Construction by Sushil Kumar, Standard Publisher, New Delhi
5. Construction of Buildings (Vol I and II) by Barry
6. Building Construction by VB Sikka; Publisher Tata McGraw Hill Publisher,New Delhi
7. Building Construction by Rangwala; Publisher Charotar Publishing House Pvt. Ltd., New Delhi
8. A Course in Civil Engineering by V.B.Sikka, Published by Tata McGraw Hill Publisher,New Delhi
9. Sharma, SK; and Mathur, GC; "Engineering Materials;" Delhi-Jalandhar, S. Chand and Co.
10. Surendra Singh; "Engineering Materials;" New Delhi, Vikas Publishing House Pvt. Ltd.
11. Choudhary, N; "Engineering Materials;" Calcutta, Technical Publishers of India.
12. Gurcharan Singh; Engineering Materials, Standard Publishers Distributors, New Delhi

2.6 *GENERAL WORKSHOP PRACTICE –II

(Common with Civil Engineering, Electrical Engineering and Chemical Engineering)

L	T	P
-	-	8

RATIONALE

In order to have a balanced overall development of diploma engineers, it is necessary to integrate theory with practice. General workshop practices are included in the curriculum in order to provide hands-on experience about use of different tools and basic manufacturing practices. This subject aims at developing general manual and machining skills in the students. In addition, the development of dignity of labour, safety at work place, team working and development of right attitude are the other objectives.

LEARNING OUTCOMES

After completing the course, the students will be able to:

- Identify tools and equipment used and their respective functions.
- Identify different types of materials and their basic properties.
- Use and take measurements with the help of basic measuring tools/equipment.
- Select proper tools for a particular operation.
- Select materials, tools, and sequence of operations to make a job as per given specification/drawing.
- Prepare simple jobs independently and inspect the same.
- Follow safety procedures and precautionary measures.
- Use safety equipment and Personal Protection Equipment.

DETAILED CONTENTS (PRACTICAL EXERCISES)

Note: The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced. The students should prepare sketches of various tools/jobs in their practical Notebook.

The following shops are included in the syllabus:

1 Fitting Shop
2 Sheet Metal Shop
3 Mason Shop
4 Machine Shop

1. FITTING SHOP

1.1 Use of personal protective equipment and safety precautions while working.
1.2 Basic deburring processes.
1.3 Introduction to fitting shop tools, marking and measuring devices/equipment.
1.4 Identification of materials. (Iron, Copper, Stainless Steel, Aluminium etc.)
1.5 Identification of various steel sections (flat, angle, channel, bar etc.).
1.6 Introduction to various fitting shop operations/processes (Hacksawing, Drilling, Chipping and Filing).

1.7 Job Practice

Job I Marking of job, use of marking tools, filing and use of measuring instruments. (Vernier caliper, Micrometer and Vernier height gauge).
Job II Filing a rectangular/square piece to maintain dimensions within an accuracy of ±.25 mm.
Job III Making a cut-out from a square piece of MS flat using hand hacksaw and chipping
Job IV Drilling and tapping practice on MS Flat.

2. SHEET METAL SHOP

2.1. Introduction to sheet metal shop, use of hand tools and accessories e.g. different types of hammers, hard and soft mallet, sheet and wire gauge, necessary allowance required during job fabrication, selection of material.
2.2 Introduction and demonstration of hand tools used in sheet metal shop.
2.3 Introduction and demonstration of various machines and equipment used in sheet metal shop e.g. Shearing Machine, Bar Folder, Burring Machine,
2.4 Introduction and demonstration of various raw materials used in sheet metal shop e.g. black-plain sheet, galvanized-iron plain sheet, galvanised corrugated sheet, aluminium sheet etc.
2.5 Study of various types of nuts, bolts, rivets, screws etc.
2.6 Job Practice

Job I: Shearing practice on a sheet using hand shears.
Job II: Practice on making Single riveted lap joint/Double riveted lap Joint.
Job III: Practice on making Single cover plate chain type, zig-zag type and single rivetted Butt Joint.

3 MASON SHOP

3.1. Introduction and importance of Mason shop
3.2. Introduction of tools, equipment and machines used in Mason shop
3.3. Job Practice

Job I : Preparation of simple bond
Job II : Preparation of Arched bond
Job III: Preparation of RCC structure (column and beam)

4 MACHINE SHOP

4.1 Study and sketch of lathe machine
4.2 Study and Sketch of grinders, milling machine, drilling machine and CNC machine.
4.3 Plain and step turning and knurling practice.
4.4 Study and sketch of planning/shaping machine and to plane a rectangle of cast iron.

MEANS OF ASSESSMENT

- Workshop jobs
- Report writing, presentation and viva voce

RECOMMENDED BOOKS

1. Workshop Technology I,II,III, by SK Hajra, Choudhary and AK Choudhary; Media Promoters and Publishers Pvt. Ltd. Mumbai.
2. Workshop Technology Vol. I, II, III by Manchanda; India Publishing House, Jalandhar.
3. Workshop Training Manual Vol. I, II by S.S. Ubhi; Katson Publishers, Ludhiana.
4. Manual on Workshop Practice by K Venkata Reddy; MacMillan India Ltd., New Delhi
5. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
6. Workshop Technology by B.S. Raghuwanshi; Dhanpat Rai and Co., New Delhi
7. Workshop Technology by HS Bawa; Tata McGraw Hill Publishers, New Delhi.

THIRD SEMESTER

3.1 HISTORY OF ARCHITECTURE-A

L	T	P
3	2	-

RATIONALE

The past work is always a foundation for progress. The knowledge of past achievements in any field is helpful for improvement and restoration. The knowledge of this course will help the students to understand how political, physical, social, economical and technological change affects the architecture, materials and construction techniques. So this subject provide the students a sense of historical developments in this field to appreciate the past skills, technology and materials used in the construction of buildings.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Indian Architecture	22	12	-
2.	Western Architecture	22	16	-
		42	28	-

DETAILED CONTENTS

I. INDIAN ARCHITECTURE:

The study of the Indian Architecture, with special emphasis on the concept of form and structure, from earliest time and to include Buddhist, Hindu and Jain Periods.

1. Temple Architecture in India. (12 Pds)

- Evolution of temple and its various parts
- Dravidian style (Southern) General characteristics, planning, motifs and treatment of different parts, construction methods and materials (e.g.shore temple at Mahabalipuram, Madurai Temple.)

2. Indo Aryan Temple (12 Pds)

- Lingaraja Temple at Bhubhaneshwar, Kandariya Mahadeo at Khajuraho, Sun Temple at Modhera; These examples must be studied with reference to: Architectural form, planning components, construction methods, materials, motifs (ornamentation)

3. Jain Temple (08 Pds)

- Dilwara Temple at Mount Abu, Ranakpur Temple. General architectural characteristics, construction methods, materials and ornamentation.

II. WESTERN ARCHITECTURE:

The study of architectural development with special emphasis on the concept of form and structure, in other countries, Egyptian, West Asiatic, Greek, Roman, Early Christian, Byzantine and Renaissance periods.

4. Early Christian Architecture (06 Pds)

. Development of church plan (Basilica), construction methods and general architectural characteristics of St. Peters, Rome

5. Byzantine Architecture (06 Pds)

- Centralized plans and construction methods for dome of St. Sophia Church)

6. Romanesque Architecture (06Pds)

- General architectural characteristics, materials and construction methods for the Pisa group of buildings.

7. Gothic Architecture (08 Pds)

- Main visual and construction vocabulary of Gothic Arch at Notre Dame Paris, and Reims Cathedral)

8. Renaissance Architecture (12 Pds)

- Early Renaissance Architecture. General architectural characteristics (Florence cathedral)
- Late Renaissance architecture. General characteristics and Role of Michael Anglo & Palladio (eg. St. Peter's Rome. The Building of the Capitoline Hill Rome & Villa Capra)

NOTE:

The teacher should try to create interest among the students for this course by organizing site visits to the local old monuments. Audio-visual aids should also be used to explain various architectural developments. While imparting instructions, teacher should stress upon the context of form and space, construction methods structural systems and materials. The teacher should motivate the students to take general reference for form, drawings structural solutions and materials from the history, while designing their project.

INSTRUCTIONAL STRATEGY

The subject may be taught through audiovisual aids, slides, PowerPoint presentations so as to explain salient architecture features and techniques. Emphasis must be laid on freehand drawing and each student should maintain a sketchbook.

RECOMMENDED BOOKS

1. Urban Pattern: - Arthur B, Gallion and B Fischer, Publisher McGraw Hill Book, New Delhi
2. History Builds the Town:- Arthur Kohn; Khanna Publisher, New Delhi
3. A history of Architecture: Settings and Rituals-Spiro Kostof; Oxford University Press *UK* -
4. Town Building in History:- Hirons; Vikas Publishing House Pvt., New Delhi
5. World Architecture:- Michael Raeburn, LBS Ltd. Faraday Close Durrington Worthing West Sussex
6. Internet Sources/Various search engines may also be used for additional information on some topics.
7. History of Architecture:- Sir Banister Fletcher, Vikas Publishing House, New Delhi
8. History of Architecture:- Satish Grover (Hindu), Publisher Roli Books(P) Ltd. Delhi
9. History of Architecture:-Percy Brown; Publisher, Taraporevala Sons, New Delhi
10. Indian Architecture (Hindu and Buddhist):- Percy Brown

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks (%) Allotted (%)
1	12	15
2	12	15
3	8	10
4	6	10
5	6	10
6	6	10
7	8	15
8	12	15
Total	**70**	**100**

3.2 BUILDING SCIENCE

(Climatology, P.H.E. and Electrical Services)

L	T	P
5	2	-

RATIONALE

The subject deals with basic requirements for building orientation in respect of climatic conditions. The essential human needs of water supply, sewage disposal and electrical services in buildings have been included in this subject. Students are expected to prepare working drawings for fixing of various fittings and fixtures, water supply and sanitary installations. Also students should be well conversant with electrical and mechanical installations in the buildings. For this purpose, it is essential that the students are taught various aspects of building services like: sanitation, water supply, electrical layout and air conditioning. Therefore, the subject of building services is very important for students undergoing diploma courses in Architectural Assistantship.

LEARNING OUTCOMES

After completing the course, the students will be able to:

- To attain knowledge about ecosystem, Environment and its resources.
- Comprehensive knowledge of climatical impact on the built environment.
- To develop the skill of preparing working drawings of plumbing system.
- To have knowledge about plumbing and sanitary fixtures and their use.
- Select materials and fixtures to make a layout as per given specification/drawing.
- To develop the skill of preparing working drawings of Electrical system.
- To know about Electrical fixtures and Lighting effect on exterior and interiors.
- To know about lift/escalator, fire fighting system, HVAC and its application
- To understand the use and application of Acoustic materials in buildings.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	L	T	P
1.	Climatology	16	6	-
2.	Public Health Engineering			
	A. Water Supply	12	6	-
	B. Sewerage & Drainage	18	8	-
3.	Electrical Services/ Mechanical Services	24	8	-
		70	28	-

DETAILED CONTENTS

1. CLIMATOLOGY:

Climate geographical and physical factors, Temperatures, Rainfall, Wind, Sky, ground, Vegetation, Micro climate and Macro climate, seasons, movement of the sun, sun charts, use of climatic data, Climatic factors in designing buildings, sun protection devices.

1. General Introduction (12 Pds)

- Introduction to Climatology
- Movement of earth around sun.
- Different elements of climate like: Wind, temperature, humidity, precipitation and pressure.
- Different climatic zones
- Orientation of building with respect to above mentioned elements of climate
- Effect of climate on man and shelter.

2. Relation of Climate and comfort (06 Pds)

- Macro-micro climatic effects
- Concept of comfort zone and bio-climatic chart
- Climatic evaluation by season

3. Sun Control and shading devices (without calculations) (12 Pds)

- Solar Chart (sun path diagram)
- Orientation for sun
- Internal and external sun protection devices
- Natural lighting
- Introduction and objectives of Solar Passive Design
- Passive solar heating and cooling

2. PUBLIC HEALTH ENGINEERING:

(A) Water Supply: (18 Pds)

Sources of water supply impurities of Domestic water, Domestic water supply, Water piping system, Average consumption of water for various activities based on Per Capita Calculation of water consumption.

(B) Sewerage & Drainage: (24 Pds)

Internal and external drainage, Basic principles of sanitation and disposals of waste matter from the building. Plumbing of buildings. Different system of plumbing of toilets in buildings. To prepare sanitary and water disposal schemes for waste water and surface drainage.

Planning of bathrooms and lavatory block in domestic buildings, standard type of sanitary fittings and fixtures, Joints, Traps, Flushing cisterns, Manholes and septic tank, Intercepting Chambers/Inspection chambers and their location, Ventilation of sewers. With detailed knowledge of various available materials of pipe.

3. ELECTRICAL/ MECHANICAL SERVICES:

Electrical Services : (10 Pds)

House wiring, L & F points, Electrical and Mechanical Fixtures, Simple electrical layouts showing panels, Distribution boards, Consumer units, Circuit breakers, High Resistance Circuit (HRC) various types of switches, sockets, conduits. with detailed knowledge of various sizes and materials of wires.

Mechanical Services : (04 Pds)

Types of Lifts, Working of lifts with details of lift section describing various parts of lifts. Escalator- types of escalators, Fundamentals of escalators, Function and working of escalators.

Fire Detection, Fire Alarm and Fire Fighting : (04 Pds)

Fire detection equipments - Heat and smoke sensors, Fire alarms System. Firefighting Equipment - Ladders, Snorkel Ladder, Fire Fighting Pump and Water Storage, Hose and Hose Fitting, Dry and wet risers, Automatic sprinklers, Fire extinguisher, Fire escape, Fire doors and water curtains.

INSTRUCTIONAL STRATEGY

Building services are as important as any other part of the building. The teachers, besides classroom teaching, should supplement the instruction by arranging field visits. A material lab cum Museum must be made available for effective and functional teaching.

Students may be encouraged to collect information, pamphlets and catalogues from different market/ manufacturing sources and prepare a scrapbook of the latest machines/fittings available for building services. Teachers may also encourage the students to go through relevant BIS codes for each topic. The subject knowledge should be used in preparing services drawings in the subject of Architectural design.

Students are suppose to show Water supply, Sanitary, Electrical arrangements in one of the small house. They should show Water supply line, Sewer line showing the position of Manholes, Septic tank, Traps etc.

STUDY REPORT AS AN ASSIGNMENT

A study report on the effect of climate and environment on contemporary buildings such as residential, commercial and public buildings should be prepared by the students. The study should emphasize on orientation of court-yards, windows, jallies, chajjas, landscape and various other sun and wind control devices.

RECOMMENDED BOOKS

1. Handbook of Designing and Installation of Services in Building Complex - High-rise Buildings by VK Jain, Publication. Khanna Publishers, New Delhi Khanna Publishers, New Delhi.
2. Water and Waste Water Technology by Mark J. Hammer and Mark J. Hammer(Jr.); Prentice Hall of India (P) Ltd., New Delhi - 110 001
3. A Text Book of Environmental Science by Subramanian; Narora Publicity (Pvt.) Ltd., New Delhi - 110 002
4. National Building Code

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	30	30
2	42	45
3	26	25
Total	**98**	**100**

3.3 ARCHITECTURAL DESIGN -B

L	T	P
4	-	8

RATIONALE

Diploma holders in Architectural Assistantship find employment with private architects and also majority of them go for self-employment. Therefore, they are required to develop aptitude/skills to design residential, commercial and other public buildings. Teachers while imparting instructions/giving design related assignments to students are expected to teach the application of various elements of design like form function, balance, light and shadow, shape, plane, volume, line, rhythm, proportions, textures and other such related elements. Teachers are also expected to show various types of designs of small building to develop and appreciation for this subject. Teachers should also motivate students to maintain sketch book/portfolio of all the assignments given to the students.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Studio	12	-	-
2.	Perspective & Sciography	10	-	-
3.	Interior Schemes	10	-	-
4.	Models	12	-	-
		56	-	112

DETAILED CONTENTS

I. STUDIO:

Studio workshop which include simple and small design of a single storey structure problems involving horizontal/vertical circulation such as weekend cottage, milk bar, clinics, nursery schools etc. Development of outdoor areas (work of student must reflect the understanding of fundamental principles, as described in syllabus of Architectural Design "A" (Basic Design). Introduction of Structure Systems (Briefly)

Drawings to be produced:

- Site plan
- Floor Plans
- Elevations
- Sections
- Views
- Block Model

Time Problem: Plan showing furniture layout and section through a given mono-functional space such as a Café, classroom in a nursery school, parking lot etc.
(Minimum two projects to be done).

II. PERSPECTIVE & SCIOGRAPHY:

Perspective, Sciography and Rendering be added so that the students may submit rendered drawings, and perspective drawing be prepared for at least one design.

III. INTERIOR SCHEMES:

Preparing interior schemes for small residences, clinics, nursery and primary schools, restaurants, shops, sub-post office etc.

IV MODELS:

One model of design in detail to be prepared by the students for which the materials etc. shall be supplied from the institution. Study of spaces and layout of furniture for various activities in small structures comprising public utilities like Fuel Station, Milk Bar, Florist Kiosk and Guard House. The study is to be presented through plans, elevations, sketches etc.

INSTRUCTIONAL STRATEGY

This is one of the most important practical oriented subject for diploma in architectural assistantship. While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Three study visits (within the state of U.P. and the adjoining States) shall be organised and a report will be prepared for the award of sessional marks. The visits shall cover Historical, Architectural and Structural as well as landscape design aspects. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such element appropriate to various designs. Teacher

may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera; Publisher Tata McGraw Hill Publisher, New Delhi
2. Architects Data by Neufert; Publisher Blackwell Publishing Ltd. 9600 Garsington Road*, Oxford*, OX4 2DQ, UK **..**
3. Space, Time and Order by DK Ching; Publisher John Wiley & Sons, Wiley
4. Architectural Aesthetics by Sangeet Sharma, Abhishek Publication, 57-59, Sector 17, Chandigarh

3.4 SURVEYING

L	T	P
2	-	8

RATIONALE

The important functions of a diploma holder in Architecture Assistantship includes the jobs of detailed surveying, plotting of survey data, preparation of survey maps and setting out works. The curriculum has been designed to develop the skill in each type of survey like chain surveying, compass surveying and leveling that the diploma holder in Architectural Assistantship will normally be expected to perform. Plane table surveying, contouring, theodolite surveying, curves and use of minor instruments have also been included in this subject.

Field work should be a selected one so that students can check their work and have an idea of the extent of error in the work done. As far as possible, the surveys done should be got plotted, as this will also reveal errors in the work and develop the skill of plotting.

LEARNING OUTCOMES

After completing the course, the students will be able:

- To attain knowledge about various measurement systems and the methods.
- To use the various measuring equipments / instruments and their applications.
- To develop the skill of keeping and maintaining field records in book.
- To develop the skill of preparing plotted drawings of the field.
- To acquire knowledge of calculating area of regular and irregular fields.
- To develop the skill of finding out levels and to draw contours on drawing sheet.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Chain Survey	5	-	20
2.	Areas	5	-	10
3.	Compass Surveying	5	-	20
4.	Leveling	5	-	20
5.	Theodolite	2	-	12
6.	Plane Table Surveying	4	-	20
7.	Total Station	2	-	10
		28	-	112

DETAILED CONTENTS

Introduction:

- Basic principles and types of surveying.
- Concept of surveying, purpose of surveying, measurements; Linear and angular, units of measurements
- Instruments used for taking these measurement, classification of survey based on instruments
- System of conversion of land measurements from traditional revenue maps/ records to MKS system.

1. CHAIN SURVEY:

   Different kinds of chains, Principles of chain survey, Equipment and instruments. The field book, method of keeping the field book. Obstacles in chain survey, Correction of length and areas due to error in chain length from standard length.

2. AREAS:

   Computation of areas of regular figures. Computation of areas of irregular figures by means of formulas, Mean ordinate method, Trapezoidal rule, Simpson's rule, Area by means of planimeter.

3. COMPASS SURVEYING:

   Prismatic compass, its use, whole circle bearings and reduced bearing. Magnetic variation, Local attraction and its elimination. Compass Traversing, Plotting, Closing error and its adjustment by graphical and other methods.

4. LEVELLING:

   Theory of leveling, Entering the readings in level book, Computing of RL by "Line of collimation" method, "Rise & Fall" method. Curvature and Refraction, Reciprocal Leveling, Temporary and permanent adjustments of Dumpy levels, contours and their uses. Contour interval, Characteristics of contours, Methods of contouring

5. THEODOLITE: (Brief idea only)

   The use of theodolite in taking horizontal and vertical angles. Interpretation of plans from architectural point of view.

6. PLANE TABLE SURVEYING:

Purpose of plane table surveying, Equipment used in plane table survey, centering, leveling and orientation of plane table. Methods of plane table surveying - Radiation, Intersection, Traversing, Resection, Two point problem and Three point problems.

7. TOTAL STATION (Brief Idea Only)

The use of Total Station in finding the Horizontal and Vertical angles as well as finding out level in building elevation.

FIELD WORK:

CHAIN SURVEYING:

Ex.(i) (a) Ranging a line.
(b) Chaining a line and recording in the field book.
(c) Testing and adjustment of chain.
Ex.(ii) Chain survey of a small area. Plate 1
Ex.(iii) Chaining a line involving obstacles in ranging.
Ex.(iv) Use of Planimeter for computing areas

COMPASS SURVEY:

Ex.(v) (a) Setting the compass and taking observations.
(b) Measuring angles between the lines meeting at a point by prismatic compass.
Ex.(vi) Traversing with the prismatic compass and chain of a closed traverse. (Recording and plotting by included angles) Plate 2
Ex.(vii) Determination of local attraction at a station by taking fore and back bearing.
Ex.(viii) To find true bearing of a line at a place.

LEVELLING:

Ex.(ix) To find the difference of level between two distant points by taking staff readings on different stations from the single setting.
Ex.(x) To find the difference of level between two points by taking atlest four change points. Plate 1

Ex.(xi) Setting a gradient by IOP level. Plate 1

Ex.(xii) Contouring of a small area by indirect methods Plate 1

PLANE TABLING:

Ex. (xiii) (a) Setting the plane table Plate-1
(b) Marking the North direction.
(c) Plotting a few points by radiation method.

Ex. (xiv) (a) Orientation by Plate-1
- Trough compass
- back sighting.

(b) Plotting a few points by intersection method.

Ex. (xv) Traversing an area with a plane table (at least four lines) Plate-1

Ex. (xvi) (a) Two point problem. Plate-2
(b) Three point problem by - Trial and error method. (Lehman's Rule)

THEODOLITE:

Ex. (xvii) Drill for taking out the theodolite, mounting on the tripod and placing it back in the box.

Ex.(xviii) Reading the vernier and working out the least count, measurement of horizontal angles by repetition method. Plate 1

Ex. (xix) Measurement of vertical angles by the use of theodolite.

TOTAL STATION:

Ex. (xx) Demonstration of Total Station

Ex. (xxi) Measurement of Levels in Building Elevation

INSTRUCTIONAL STRATEGY

This is highly practice-oriented course. While imparting theoretical instructions, teachers are expected to demonstrate the use of various instruments in surveying, stress should be laid on correct use of various instruments so as to avoid/minimize errors during surveying. It is further recommended that more emphasis should be laid in conducting practical work by individual students

RECOMMENDED BOOKS

1. "Surveying"; Narinder Singh; New Delhi, Tata McGraw Hill Publishing Co Ltd.
2. "Text Book of Surveying"; Hussain, SK and Nagraj, MS; New Delhi, S Chand and Co Ltd.
3. "A Text Book Surveying and Levelling"; Deshpande, RS; Poona, United Book Corporation
4. "A Text Book of Surveying" Kocher, CL; Ludhiana, Katson Publishing House
5. "Surveying and Leveling, Kanetkar, TP and Kulkarni, SV., ", Poona, AVG Parkashan
6. "Surveying and Leveling-Vol.2" Kanetkar, TP; and Kulkarni, SV; Poona, AVG Prakashan
8. "Surveying and Leveling- Vol.2", Punima, BC; Delhi Standard Publishers Distributors, Delhi
8. "A Text Book of Surveying Vol. 2", Shahai, PB; Oxford and IBH Publishing Co.
9. Fundamentals of Surveying by Roy SK; Prentice Hall of India (P) Ltd., New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Periods Allotted	Marks Allotted (%)
1	25	20
2	15	15
3	25	18
4	25	18
5	14	06
6	24	18
7	12	05
Total	**140**	**100**

3.5 CONSTRUCTION AND MATERIALS- II

(The study of constituents, properties, uses and applications)

L	T	P
3	-	3

RATIONALE

The fundamentals of the paper has already been dealt with in the previous year and the students are aware of the materials and construction principles involved. With the development of the technology, many a more materials have come up. Their use in modern architecture is inevitable so their knowledge is also vital. These materials have been given place in this paper to make the knowledge complete.

LEARNING OUTCOMES

After completing the course, the students will be able :

- To acquire knowledge about various construction materials and their application.
- To understand the planning and details of staircase for its best placement.
- To draw the details of various elements of doors and windows.
- To draw the details of various elements of floors and cavity walls and their application methods.
- To acquire knowledge to stop entry of dampness and termite in buildings.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	L	T	P
1.	Materials	12	-	08
2.	Doors & Windows	08	-	10
3.	Staircases	10	-	12
4.	Damp Proofing	04	-	02
5.	Floors & Cavity Walls	08	-	10
		42	-	42

DETAILED CONTENTS

1. MATERIALS:
   Properties and uses of Building materials such as Asbestos, Gypsum Product, Various types of Glass, Various types of Building Boards (Particle Board, Fiber Board, Block Board and Ply Board laminates), Plastics, Corks, Rubber, Aluminum, Steel, Various Flooring materials, Damp Proofing and Water Proofing Materials. Different types of adhesives.

2. DOORS AND WINDOWS:
   Study of elements of buildings such as doors and windows in metal and wood including, sliding door, rolling shutter, revolving and collapsible doors, skylights.

3. STAIRCASES AND RAMPS:
   - Definition and types of staircases as per staircase nomenclature, Planning and layout of staircase, Staircases of different materials; R.C.C., steel and Timber.
   - Definition and types of ramps, purpose, slopes or Gradients.
   - Drawing a dog leg wooden staircase
   - Spiral steel staircase
   - RCC staircase cast-in-situ

4. DAMP PROOFING:
   Definition and types of D.P.C. (damp proof course), Vertical D.P.C. and Damp proofing of Basements, Water tanks, Roof top Terraces. Special damp proofing arrangements for bathroom, W.C. and kitchen

5. FLOORS AND CAVITY WALLS:
   Types of floor Cement Concrete flooring, Terrazzo flooring, Timber flooring, Various types of tile flooring. Purpose of providing cavity walls, Types of cavity walls.

   Total Number of Drawings: 10

INSTRUCTIONAL STRATEGY

Class instruction is to be supplemented by studies models and visit to construction sites. The studio periods are to be devoted to preparation of detailed construction drawings of all the above building elements. Students may prepare the port-folio of the work done by them throughout the session. Teacher may also organize viva-voce after each drawing assignment so as to test the level of understanding of the students about underlying concepts, principles, and procedures.

RECOMMENDED BOOKS

1. Building Construction by WB Mackay; Khanna Publisher, New Delhi
2. Building Construction by SP Bindra and SP Arora; ; publisher Dhanpat Rai & Co. New Delhi
3. Building Construction by BC Punmia; Publisher Laxmi Publication, New Delhi
4. Building Construction by Sushil Kumar; Standard Publisher, New Delhi
5. Construction of Buildings (Vol I and II) by Barry
6. Building Construction by VB Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
7. Building Construction by Rangwala; Publisher Charotar Publishing House Pvt. Ltd., New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Periods Allotted	Marks Allotted (%)
1	20	25
2	18	20
3	22	25
4	06	10
5	18	20
Total	**84**	**100**

3.6 COMPUTER AIDED DESIGN

L	T	P
-	-	6

RATIONALE

In the present times an architectural assistant should be capable of drafting drawings on the computer. Due to increasing need for computerized drawings by most architects for their ease of drafting, editing, managing and presentation at the end of the course the students should be able to make 2-D architectural drawings for presentation and construction purposes. The student should get familiar with the latest AutoCAD versions.

DETAILED CONTENTS

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

1. Introduction to AutoCAD (Latest version or AutoCAD2007) (02 hrs)

- Input devices
- Graphics
- Starting AutoCAD
- Inside the drawing editor
- Commands in the menus (Tool bars)
- Accessing Commands
- Entity selection
- Entering coordinates
- Folders for organizing drawings and files

Exercise: Creating folders and sub folders

2. Creating and Saving a new Drawing (02 hrs)

- Commands and options to create new drawings
- Units
- Limits
- Snap
- Grid
- Ortho
- Layer
- Application of layers
- Open a new, existing drawing
- Save, save as, quit, close, exit
- Customization of tool bars

Exercise: Setting up a new drawing with units, limits etc

3. Drawing Commands (12 hrs)

- Line
- Poly line/Double line.
- Arc
- Ellipse
- Polygon
- Rectangle
- SP line
- Circle
- Sketch.
- Hatch
- Donuts

Exercise: Making a composition of different geometrical shapes using various drawing commands

4. Viewing an Existing Drawing (04 hrs)

- Zoom
- Pan
- Redraw and Regen all · Regen Auto
- View

Exercise: Viewing, zooming of existing drawing made in section 3.

5. Modifying an Existing Drawing (16 hrs)

- Undo Redo/Oops
- Trim
- Move
- Offset
- Rotate
- Array
- Stretch
- Divide
- Champher
- Erase
- Break
- Copy, multiple copy
- Mirror (Mirror test)
- Change (change properties)
- Extend

- Explode
- Blip mode
- Scale
- Fillet

Exercise: a) Modifying composition made in section 3
b) Making plan, elevation and section of simple building

6. Making and Inserting Blocks (12 hrs)

- Blocks
- Insert block
- Base
- Using library for blocks
- W-block
- X-ref
- Explode

Exercise: Inserting furniture, fixtures, trees etc. in the plans, sections and elevations made in section 5.

7. Dimensioning and Text (08 hrs)

- Dimension type, style, unit
- Dimension utilities
- Dimension variables
- Dimensioning of different elements like (Horizontal, vertical, inclined). Arc. Circle Radius, diameter, continuous dimensioning etc.
- Editing dimension text and updating (adding new text and editing existing text)
- Text style - font types, height, width factor etc. as per plotting paper size.

Exercise: Dimensioning and editing text in composition made in Sections 5 and 6.

8. Plotting Drawings (08 hrs)

- Plot command
- Selecting area for plotting.
- Scale of plot, scale to fit .
- Selecting plotting device
- Selecting paper size and type
- Selecting black and white or colored plots
- Selecting appropriate print speed, quality, Print preview.
- Working in Paper space and plotting

9. Introduction of 3-D Modeling for making Perspective views

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. Towards the end of the session each student should be given independent computer based project assignment. Experts 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 be laid on training the students through availing help from the user friendly architectural softwares so that they develop confidence and are able to work independently.

Note :- The Board will set the Question Paper for exercises for external examination

FOURTH SEMESTER

4.1 *COMMUNICATION SKILLS – II

L	T	P
4	-	2

RATIONALE

Knowledge of English Language plays an important role in career development. This subject aims at introducing basic concepts of communication besides laying emphasis on developing listening, speaking, reading and writing skills as parts of Communication Skill.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Frame correct sentences with illustrations
- Comprehend the language correctly
- Interpret the language correctly
- Use given material in new situations.
- Correspond effectively using various types of writings like letters, memos etc.
- Communicate effectively in English with appropriate body language making use of correct and appropriate vocabulary and grammar in an organised set up and social context.

DETAILED CONTENTS

1. Functional Grammar (16 periods)

    1.1 Prepositions
    1.2 Framing Questions
    1.3 Conjunctions
    1.4 Tenses

2 Reading (16 periods)

    2.1 Unseen Passage for Comprehension (Vocabulary enhancement - Prefixes, Suffixes, one word substitution, Synonym and Antonym) based upon the passage should be covered under this topic.

3 Writing Skill (24 periods)

3.1. Correspondence
   a) Business Letters- Floating Quotations, Placing Orders, Complaint Letters.
   b) Official Letters- Letters to Government and other Offices
3.2. Memos, Circular, Office Orders
3.3. Agenda & Minutes of Meeting
3.4. Report Writing

LIST OF PRACTICALS

Note: Teaching Learning Process should be focused on the use of the language in writing reports and making presentations.
Topics such as Effective listening, effective note taking, group discussions and regular presentations by the students need to be taught in a project oriented manner where the learning happens as a byproduct.

Speaking and Listening Skills

1. Debate
2. Telephonic Conversation: general etiquette for making and receiving calls
3. Offering- Responding to offers.
4. Requesting – Responding to requests
5. Congratulating
6. Exploring sympathy and condolences
7. Asking Questions- Polite Responses
8. Apologizing, forgiving
9. Complaining
10. Warning
11. Asking and giving information
12. Getting and giving permission
13. Asking for and giving opinions

INSTRUCTIONAL STRATEGY

Students should be encouraged to participate in role play and other student-centered activities in class rooms and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by RevathiSrinivas; Abhishek Publications, Chandigarh.
2 Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.
3 High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.
4. e-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

Websites for Reference:

1. http://www.mindtools.com/ page 8.html – 99k
2. http://www.letstalk.com.in
3. http://www.englishlearning.com
4. http://learnenglish.britishcouncil.org/en/
5. http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	16	28
2	16	28
3	24	44
Total	**56**	**100**

4.2 TOWN PLANNING

L	T	P
3		2

RATIONALE

In the developmental work of town and country planning, various agencies are involved like Department of Town planning, Housing and Development Boards of various states, Development Authorities, Corporations and Municipalities of various towns and cities. Students getting employment in these organizations are expected to prepare master plan, layout of housing schemes showing roads, parks, etc. The paper aims to fulfill the need.

LEARNING OUTCOMES

After completing the course, the students will be able :

- To acquire knowledge about various components of town planning in terms of bye laws and other regulations of the authorities.
- To understand the planning and details of roads and circulation to make it's easy approach and design of minimum required road width .
- To plan the various segments (plotted development, roads, open/green spaces, community spaces, EWS quota, commercial, tot-lots, services etc. required for a small town.
- To draw the details of common services like electrical, water supply , sanitation and drainage system.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Introduction	22	13	-
2.	City Planning	20	15	-
		42	28	-

DETAILED CONTENTS

1. INTRODUCTION:

Historical background of the modern city planning movement. Objects, importance and principles of town planning. Ancient town planning in India. Plans of old Indian cities - Mohenjo-Daro and Harappa, Taxila and Nalanda.

2. CITY PLANNING:

An introduction to the fundamental principles of city planning. Planning process, site selection, site planning in relation to Physical conditions, Landscape. Land use plan, Master plan, regional plan in relation to Chandigarh, Jaipur, Zoning for houses, Social centers, Layout of roads, Surface and subsurface drainage, Community services. Slums and their improvement. Development of garden.

RECOMMENDED BOOKS

1. Town Planning by Rangwala, BSC Publishers and Distributers .
2. Fundamental of Town Planning by G.K. Hiraskar Published by Dhanpat Rai Publication.
3. The Great Ages of World Architecture by G.K. Hiraskar Published by Dhanpat Rai Publication.
4. Text Book of Urban Planning and Geography by Sameer Sharma , Published by PHI learning Pvt .Ltd. Delhi.
5. Urban Planning: Theory and Practice by M. Pratap Rao Publised by CBS
6. City Planning in India 1947-2017 , by Ashok Kumar ,Sanjeev Vidhyarthi , Poonam Prakash Publised by Rontledge india.
7. Urban and regional Planning in india by Kulshrastha S.K., Publishers SAGE Publication India Pvt. Ltd.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	35	50
2	35	50
Total	**70**	**100**

4.3 STRUCTURE - A

L	T	P
5	2	-

RATIONALE

The subject is an important part of Architectural Assistantship Curriculum. Study of this subject enables the student to distinguish between different types of stresses and strains in the material, under the action of external forces. The student will learn to analyse simple structural elements for their design, which he usually needs in their professional life. The contents of the subject have been selected in such a way as they form the basis of structural design proposed to be taught in the succeeding year.

LEARNING OUTCOMES

After completing the course, the students will be able:

- To acquire knowledge about various construction materials and their application in terms of Structural safety and strength.
- To understand the planning and details of various types of building structures such as concrete, steel and wood.
- To calculate various loads over a structural member.
- To calculate bending moment and shear force for a particular structural member.
- To draw the details of load bearing members like footings, columns, beams and slabs.
- To draw the details of reinforcement in various concrete structural members.
- To acquire knowledge of design of reinforcement for small concrete structure.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L.	T.	P.
1.	Bending Moment and Shear Force	10	4	-
2.	Bending and Shear Stresses	10	4	-
3.	Combined Direct & Bending Stresses	11	4	-
4.	Slopes and Deflection of beams	12	5	-
5.	Columns & Struts	12	5	-
6.	Structural Steel Connections A. Riveted Joints B. Welded Joints	15	6	-
		70	28	-

DETAILED CONTENTS

1. Bending Moment and Shear Force:

Concept of a beam, and supports (Hinged, Roller and Fixed). Types of Beams: Simply supported, cantilever, fixed overhang and continuous beams, types of loads (distributed, point and varying). Concept of Bending Moment & Shear Force. Sign conventions. Bending moment and shear force diagrams for cantilever, simply supported and overhanging beams subjected to uniformly distributed, concentrated and uniformly varying loads. Relationship between load, shear force and bending moment. Point of maximum B.M. and contra flexure, concept of fixed and continuous beams.

2. Bending and Shear Stresses

Assumption of theory of simple bending. Derivation of the equation. M/I=F/Y=E/R. Concept of second moment of area, Radius of gyration, Theorems of parallel and perpendicular axes, Second Moment of area for sections: rectangle, triangle, circle, trapezium, angle, Tee, I, Channel and compound sections. Moment of resistance, section modulus and permissible bending stresses, Bending stresses in circular sections.

3. Combined Direct & Bending Stresses:

Concentric and eccentric loads, eccentricity, effect of eccentric load on the section, middle third rule; stresses due to eccentric loads. Examples in the case of Short columns, chimneys and dams.

4. Slopes and Deflections of Beams:

Definition of slope and deflection, sign convention. Circular bending. Calculation of maximum slope and deflection for the following standard cases by double integration or moment area method.

(1) Cantilever having point load at the free end. Cantilever having point load at any point of the span. Cantilever with uniformly distributed load over the entire span. Cantilever having U.D.L. over part of the span from free end. Cantilever having U.D.L. over a part of span from fixed end.
(2) Simply supported beam with point load at centre of the span. Simply supported beam with U.D.L. over entire span.

NOTE: All examples will be for constant moment of inertia without derivation of formulae.

5. Columns & Struts:

Definition of long column, short column and strut, slenderness ratio, equivalent length, critical load, collapse Load, end conditions of column. Application of Eular's and Rankine's formula (no derivation), simple numerical problems based on Euler's and Rankine's formulae.

6. Structural Steel and Connections

(A) Riveted Joints:

Types of rivets, permissible stresses in rivets. Types of riveted joints, Failure of riveted joints, Assumptions made in the design of riveted joints. Specification for riveted joints. Design of riveted joints for axially loaded members.

(B) Welded Joints:

Comparison between riveted and welded joints, types of welds, permissible stresses in welds, types of welded connections, strength of welded joint, Design of welded joints for axially loaded members.

INSTRUCTIONAL STRATEGY

This subject is introduced so that diploma holder in Architectural Assistantship may appreciate the concepts and principles of structural design of various elements of building and are able to apply the knowledge gained through the subject for the design of simple and small components. Teacher should give simple exercises involving the applications of various concepts and principles being taught in the subject. Efforts should be made to prepare tutorial sheets on various topics and students should be encouraged/guided to solve the tutorial problems independently. Teacher may conduct weekly small quiz sessions to know the students' level of understanding and if need be teacher may reinforce the concepts and principles related to structural behaviour of elements/members of building components

RECOMMENDED BOOKS

1- Structure Mechanics for Architects – Prof. Harbhajan Singh, Pub. Abhishek Publications, Chandigarh.
2- Structural Mechanics-VS Prasad-Golgotia Publication Pvt. Ltd., New Delhi.
3- A text book of Engineering Mechanics- RK Rajput-Dhanpat Rai Publications Pvt. Ltd., New Delhi
4- Theory of Structures by Rajeev Kumar; Satya Prakashan, New Delhi.
5- Structural Analysis (Vo. 1 & 2) by SS Bhavikatti; Vikas Publishing House Pvt. Ltd., New Delhi – 110 014

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	14	15
2	14	15
3	15	15
4	17	18
5	17	17
6	21	20
Total	**98**	**100**

4.4 HISTORY OF ARCHITECTURE - B

L	T	P
3	2	-

RATIONALE

The past work is always a foundation for progress. The course on History of Architecture develops appreciation regarding past and current trends in the field of architecture. The knowledge of this course will help the students to understand, how political, physical, social, economical and technological change affect the architecture, materials and construction techniques.

The teacher should try to create interest among the students for this course by organizing site visits to the local old monuments. Audio-visual aids should also be used to explain various architectural developments. While imparting instructions, teacher should stress upon the context of form and space, construction methods structural systems and materials. The teacher should motivate the students to take general reference for form, drawings structural solutions and materials from the history, while designing their project.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Islamic Architecture in India	16	12	-
2.	Modern Architecture in Europe and America.	13	8	-
3.	Contemporary/post Independence Architecture in India	13	8	
		42	28	-

DETAILED CONTENTS

1. Islamic Architecture in India (14 hrs)

1.1 Introduction of Islam in India, new building types, structural system and ornamentation (Qutab Complex)

1.2 Development of Indo-Islamic architectural style, the sultanate period of Lodhi's & Tughlaqs.- General architectural vocabulary and construction methods/materials of Lodhi Tomb & Tomb of Ghiya-ud-din Tughlag.

1.3 Provincial Styles- Jaunpur and Bijapur (Jama Masjid and Gol Gumbaz)

1.4 Mughal Architecture-General architectural characteristics to understand architectural vocabulary & construction methods in (Humayun's Tomb,Fatehpur Sikri, Red Fort, Taj Mahal at Agra and Jama Masjid at Delhi).

2. Modern Architecture in Europe and America. (16 hrs)

2.1 Emergence of modern architecture in Europe. Social, technological and aesthetic concerns of modern movement. New building materials (concrete, steel and glass) and their architectural expression.

2.2 Philosophy and key works of Louis Sullivan, Walter Gropius, Frank Lloyd Wright, Mies Van De Rohe, Le Corbusier.

3. Contemporary/ post Independence Architecture in India (12 hrs)
Work of Le Corbusier in India, Louis Kahn, Charles Correa, B.V. Doshi, Joseph Allen Stein and Raj Rewal. A. P. Kanvinde, etc.

(Minimum two buildings of each architect to be studied)

INSTRUCTIONAL STRATEGY

The subject may be taught through audiovisual aids, slides, PowerPoint presentations so as to explain salient architectural features and techniques. Emphasis must be laid on freehand drawing and each student should maintain a sketchbook ,Students should prepare reports of an existing structure / building / monuments.

RECOMMENDED BOOKS

1. Urban Pattern: Arthur B. Gallion. Publisher, Van Nostrand Reinhold, 1993, New York
2. History Builds the Town - Arthur Kohn. Khanna Book Publishing Co. (P) Ltd., New Delhi.
3. World Architecture : An Illustrated History From Earliest Times by Trewin Copplestone, Publisher, Crescent Books, New York
4. Architecture of Towns and Cities - Paul D. Spreinegen, publishing by Rainbow Book Co. New Delhi
5. Space, Time and Architecture - Sigfried B. Giedeon Publisher, Harvard University Press, UK
6. The New Landscape - Charles Correa Publisher: Bombay : Book Society of India, Bombay
7. Charles Correa - William Curtis, Publisher: Mapin Publishing, UK
8. History of Architecture:- Sir Banister Fletcher, Vikas Publishing House, New Delhi
9. History of Architecture:-Percy Brown; Publisher, Taraporevala Sons, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	28	40
2	21	30
3	21	30
Total	**70**	**100**

4.5 ARCHITECTURAL DESIGN - C

(Studio, Working drawing, interior schemes Architectural forms, models & seminars)

L	T	P/D
4	-	12

RATIONALE

The architectural design has been divided in four papers A,B,C & D. Paper-A deals with the fundamental concepts and principles of design and Paper-B & C deals with the application of these principles for making certain categories of buildings of common use. The paper-D deals with the design of many more buildings of common utility and their interior decoration and civic and municipal bye-laws under effect.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P/D
1.	Studio	24	-	40
2.	Working Drawing	10	-	50
3.	Interior Schemes and Architectural Forms	16	-	36
4.	Model	06	-	42
		56	-	168

DETAILED CONTENTS

1. STUDIO:

Understanding of building bye laws : Horizontal and Vertical circulations, materials restrictions, different types of area and their role i.e. Floor area ratio (FAR), Floor space index (FSI), Carpet area, Floor area, Plinth area, Built up area, Covered area, usable area, circulation area, super area, height restriction, Setbacks, Ground coverage or foot print, Width of road and right of way and other related terms/ bye laws of concern local authority.

Understanding of Design according to climate and site constraints : sun movement, air movement, sloped/ contoured site, building orientation, space placement and proposed construction materials should be in-support (Vernacular) to climate responsive building.

Design exercises could be focused on Duplex residential building, Primary school, commercial complex, library buildings with reading room, small hospital, picnic spot, college canteen, recreation building etc. having plan elevation, section, perspective of above buildings, views showing the interior scheme (work of student must reflect the understanding of fundamentals like; inter - space co-relation and their connectivity to each other as described in syllabus of Architectural Design "A" and "B").

2. WORKING DRAWING:

Working drawing of atleast one design be prepared. All drawings submitted will be rendered, design seminar be added like IInd year Architectural Design-B.

3. INTERIOR SCHEMES AND ARCHITECTURAL FORMS:

Preparing interior schemes for single rooms, especially in residential houses, offices, Entrance lobbies etc. Draw plans, Elevations and colour schemes.

Architectural Murals for different types of buildings such as Auditorium, Recreation centers, Museums etc. Rendering of all types of perspectives in pencil, ink and colours.

Acoustics: Brief description of basic terms used in acoustics and reverberation time, Acoustical treatment on walls, Floors and ceilings to be taught to students especially for small recording studio, seminar halls etc.

4. MODEL:
One model of a design to be prepared by the students for which materials may be selected out of; photographic mount board, Wood, Acrylic sheet be used for making models.

NOTE :

At least Two Submission should be drawn on AUTOCAD and to be presented on suitable size of sheet with desired scale.

INSTRUCTIONAL STRATEGY

This is one of the most important practical oriented subject for diploma in architectural assistantship. While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rythem, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material

available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera
2. Architects Data by Neufert; Publisher Blackwell Publishing Ltd. 9600 Garsington Road, Oxford, OX4 2DQ, UK
3. Space, Time and Order by DK Ching; Publisher: John Wiley & Sons, New Delhi
4. Architectural Aesthetics by Sangeet Sharma, Abhishek Publication, Chandigarh

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	64	20
2	62	30
3	50	30
4	48	20
Total	**224**	**100**

4.6 ESTIMATING, COSTING & SPECIFICATION

L T P
5 2 -

RATIONALE

This is an applied engineering subject. Knowledge of this subject will enable the Architectural Assistant to work out the quantities and cost of works relating to buildings and public health. The teachers should lay more emphasis on practical's to the extent possible.

LEARNING OUTCOMES

After completing the course, the students will be able:

- To understand the conversion of units and their application.
- To understand the methods of finding the various quantities to be used in buildings.
- To take out the quantity based estimates of the components of building .
- To analyze be rates of varies materials and labour components of the building.
- To acquire knowledge of specifications of various materials to be finalized for the application in a building or construction site.
- To find out the complete valuation of a constructed building or a purposed building.
- To acquire the detail knowledge of application of public health engineering components and their estimated quantities and the rates .

TOPIC WISE DISTRIBUTION OF PERIODS

Sr.No.	Topics	L	T	P
1.	Introduction	6	2	-
2.	Units	6	2	-
3.	Methods of Taking Out Quantities	6	2	-
4.	Detailed Estimate	10	4	-
5.	Analysis of Rates	10	4	-
6.	Specifications	10	4	-
7.	P. H. E. Items	10	4	-
8.	Valuation	12	6	-
		70	28	-

DETAILED CONTENTS

1. INTRODUCTION:

Introduction to Estimating: Types of building estimates, drawings, to be attached with these estimates. Preparation of rough cost estimates.

2. UNITS:

Units of measurement and units of payment of different items of works related to buildings.
Conversion of units

3. METHODS OF TAKING OUT QUANTITIES:

Different methods of taking out quantities: Centre line in- to-in/out-to-out methods.

4. DETAILED ESTIMATE:

Preparation of a detailed estimate, together with practice in taking of detailed quantities for simple items of work in respect of simple single storied building not more than two rooms. All the quantities from excavation to parapet including finishes should be taken out from the drawings prepared by the students or suggested by the teacher concerned. Also calculate the details of measurement and abstract of cost with the help of current SOR (schedule of rates) of UPPWD. Preparation of summery of cost and form "J". This task must be dealt as a small project.

5. ANALYSIS OF RATES:

Steps in the analysis of rates for the following items of work, requirement of material, labour, sundries and contractors profit.

(a) Earth work in excavation in foundation and trenches.

(b) Earth work in filling in foundation, trenches and up to plinth level.

(c) Plain Cement concrete in foundation.

(d) Brick work in foundation.

(e) Brick work in super structure.

(f) Plastering and Pointing.

(g) Flooring.

(h R.C.C. work in foundations, columns, beams, lintels and sunshade.

(i) R.C.C. work in roof slab.

(j) Wood work in doors and windows frames.

(k) Wood work in shutters of doors and windows.

(l) White washing, distempering, waterproof cement paint on walls and ceiling.

(m) Painting or polishing on doors and windows.

6. SPECIFICATIONS:

Need, General specifications of buildings, methods of writing specifications. Detailed specifications of the above items of work as in Topic-5 above.

7. P. H. E. ITEMS:

Preparation of estimate of P. H. E. (Public Health Engineering) items.

i. Preparation of detailed estimate for laying a water supply line.

ii. Preparation of detailed estimate for sanitary and water supply fittings in a domestic building containing one set of toilet ,septic tank and soak pit.

8. VALUATION:

Purpose of valuation, Principles of valuation, Definitions of terms such as description sinking fund, salvage and scrap value. Valuation of a building property by replacement cost method and rental return methods. Method of calculation of standard rent.

RECOMMENDED BOOKS

1. Estimating and costing in civil engineering by Dutta B.N (in English & Hindi) UBS Publishers Distributors Ltd .
2. Estimating costing and valuation by Dr. R.P. Retholiya Prof. Bhavesh V. Modi and Mayur R. Rethaliya atal prakashan , Ahemdabad .
3. Civil Engineering Hand Book by P.N. Khanna UBS Publishers .
4. सिविल अभियांत्रिकी प्राक्कलन एवं मूल्यांकन (Civil Engineering & Costing) by Dr. Vinod Gupta and Manisha Agarwal Neelkanth Publishers Pvt. Ltd.

5. Estimating, Costing and Valuation (Civil) by Pasrija, HD, Arora, CL and S. Inderjit Singh; New Asian Publishers, Delhi,
6. Estimating and Costing by Mahajan Sanjay; Satya Parkashan, Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	8	6
2	8	6
3	8	14
4	14	14
5	14	14
6	14	14
7	14	16
8	18	16
Total	**98**	**100**

FIELD EXPOSURE (PROFESSIONAL TRAINING) of students

(During summer vacation after IVth Semester)

It is needless to emphasize further the importance of Professional Training of students during their 3 years of studies at Polytechnics. It is Professional training, which provides an opportunity to students to experience the environment and culture of corporate construction offices/ Government construction and Design departments/ Practicing Architect's offices/ Construction Agencies/ Builder's Organisations / Design Consultation units and commercial activities undertaken in field organizations. It prepares student for their future role as diploma Architect in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging Professional training of students of various durations to meet the above objectives.

This document includes guided and supervised Professional training of a minimum of 4 weeks duration to be organised during the semester break starting after second year i.e. after IV Semester examinations. The concerned HODs along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule may be drawn for each student before starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, Working environment, Designing and Drafting process, important machines and Drafting tools used in the training organization.

Equally important with the guidance is supervision of students training in the office/organization by the teachers. A minimum of one visit by the teacher is recommended. Students should be encouraged to write daily report in their diary to enable them to write final report and its presentation later on.

An external assessment of 50 marks has been provided in the study and evaluation scheme of VIth Semester. Evaluation of professional training report through viva-voce/presentation aims at assessing student's understanding of Drafting various working drawings , Designing process, practices in offices/field organization and their ability to engage in activities related to problem solving in professional setup as well as understanding of application of knowledge and skills learnt in real life situations. The formative and summative evaluation may comprise of weightage to performance in testing, general behaviour, quality of report and presentation during viva-voce examination. It is recommended that such evaluations may be carried out by a team comprising of concerned HOD, teachers and representative from Organisation. Teachers and students are requested to see the footnote below the study and evaluation scheme of IV Semester for further details.

FIFTH SEMESTER

5.1 *ENERGY CONSERVATION

L	T	P
3	-	2

RATIONALE

The requirement of energy has increased manifolds in last two decades due to rapid urbanization and growth in industrial/service sector. It has become challenging task to meet ever increasing energy demands with limited conventional fuels and natural resources. Due to fast depletion of fossil fuels and a tremendous gap between supply and demand of energy, it is essential to adopt energy conservation techniques in almost every field like industries, commercial and residential sectors etc. Energy conservation has attained priority as it is regarded as additional energy resource. Energy saved is energy produced. This course covers the concepts of energy management and its conservation. It gives the insight to energy conservation opportunities in general industry and details out energy audit methodology and energy audit instruments.

LEARNING OUTCOMES

After undergoing this subject, the students will be able to:

- define principles and objectives of energy management and energy audit.
- understand Energy Conservation Act 2001 and its features.
- understand various forms & elements of energy.
- identify electrical and thermal utilities. Understand their basic principle of operation and assess performance of various equipments.
- identify areas of energy conservation and adopt conservation methods in various systems.
- evaluate the techno economic feasibility of the energy conservation technique adopted.

DETAILED CONTENTS

1. Basics of Energy

    1.1 Classification of energy- primary and secondary energy, commercial and non-commercial energy, non-renewable and renewable energy with special reference to solar energy, Capacity factor of solar and wind power generators.
    1.2 Global fuel reserve
    1.3 Energy scenario in India and state of U.P. Sector-wise energy consumption (domestic, industrial, agricultural and other sectors)
    1.4 Impact of energy usage on climate

2. Energy Conservation and EC Act 2001

2.1 Introduction to energy management, energy conservation, energy efficiency and its need

2.2 Salient features of Energy Conservation Act 2001 & The Energy Conservation (Amendment) Act, 2010 and its importance. Prominent organizations at centre and state level responsible for its implementation.

2.3 Standards and Labeling: Concept of star rating and its importance, Types of product available for star rating

3. Electrical Supply System and Motors

3.1 Types of electrical supply system

3.2 Single line diagram

3.3 Losses in electrical power distribution system

3.4 Understanding Electricity Bill: Transformers Tariff structure, Components of power (kW, kVA and kVAR) and power factor, improvement of power factor, Concept of sanctioned load, maximum demand, contract demand and monthly minimum charges (MMC)

3.5 Transformers: Introduction, Losses in transformer, transformer Loading, Tips for energy savings in transformers

3.6 Electric Motors

Types of motors, Losses in induction motors Features and characteristics of energy efficient motors, Estimation of motor loading, Variation in efficiency and power factor with loading, Tips for energy savings in motors

4. Energy Efficiency in Electrical Utilities

4.1 Pumps: Introduction to pump and its applications, Efficient pumping system operation, Energy efficiency in agriculture pumps, Tips for energy saving in pumps

4.2 Compressed Air System: Types of air compressor and its applications, Leakage test, Energy saving opportunities in compressors.

4.3 Energy Conservation in HVAC and Refrigeration System: Introduction, Concept of Energy Efficiency Ratio (EER), Energy saving opportunities in Heating, Ventilation and Air Conditioning (HVAC) and Refrigeration Systems.

5. Lighting and DG Systems

   5.1 Lighting Systems: Basic definitions- Lux, lumen and efficacy, Types of different lamps and their features, Energy efficient practices in lighting
   5.2 DG Systems: Introduction, Energy efficiency opportunities in DG systems, Loading estimation

6. Energy Efficiency in Thermal Utilities

   6.1 Thermal Basics: Thermal energy, Energy content in fuels, Energy Units and its conversions in terms of Metric Tonne of Oil Equivalent (MTOE)
   6.2 Energy Conservation in boilers and furnaces : Introduction and types of boilers, Energy performance assessment of boilers, Concept of stoichiometric air and excess air for combustion, Energy conservation in boilers and furnaces, Do's and Don'ts for efficient use of boilers and furnaces
   6.3 Cooling Towers: Basic concept of cooling towers, Tips for energy savings in cooling towers
   6.4 Efficient Steam Utilization

7. Energy Conservation Building Code (ECBC)

   7.1 ECBC and its salient features
   7.2 Tips for energy savings in buildings: New Buildings, Existing Buildings

8. Waste Heat Recovery and Co-Generation

   8.1 Concept, classification and benefits of waste heat recovery
   8.2 Concept and types of co-generation system

9. General Energy Saving Tips in :

   9.1 Lighting
   9.2 Room Air Conditioner
   9.3 Refrigerator
   9.4 Water Heater
   9.5 Computer
   9.6 Fan, Heater, Blower and Washing Machine
   9.7 Colour Television
   9.8 Water Pump
   9.9 Cooking
   9.10 Transport

10 . Energy Audit

10.1 Types and methodology
10.2 Energy audit instruments
10.3 Energy auditing reporting format

PRACTICAL EXERCISES

1. To conduct load survey and power consumption calculations of small building.
2. To check efficacy of different lamps by measuring power consumption and lumens using lux meter.
3. To measure energy efficiency ratio (EER) of an air conditioner.
4. To measure effect of valve throttling and variable frequency drive (VFD) on energy consumption by centrifugal pump.
5. To measure and calculate energy saving by arresting air leakages in compressor.
6. To measure the effect of blower speed on energy consumed by it.

STUDENT ACTIVITIES ON ENERGY CONSERVATION/ENERGY EFFICIENCY

- Presentations of Case Studies
- Debate competitions
- Poster competitions
- Industrial visits
- Visual Aids

INSTRUCTIONAL STRATEGY

Teachers are expected to lay considerable stress on understanding the basic concepts in energy conservation, principles and their applications. For this purpose, teachers are expected to give simple problems in the class room so as to develop necessary knowledge for comprehending the basic concepts and principles. As far as possible, the teaching of the subject must be supplemented by demonstrations and practical work in the laboratory. Visits to industries must be carried out. Expert from industry must be invited to deliver talks on energy conservation to students and faculty.

RECOMMENDED BOOKS

1. Guide book on General Aspects of Energy Management and Energy Audit by Bureau of Energy Efficiency, Government of India. Edition 2015
2. Guide book on Energy Efficiency in Electrical Utilities, by Bureau of Energy Efficiency, Government of India. Edition 2015
3. Guide book on Energy Efficiency in Thermal Utilities, by Bureau of Energy Efficiency, Government of India. Edition 2015
4. Handbook on Energy Audit & Environmental Management by Y P Abbi & Shashank Jain published by TERI. Latest Edition

Important Links:

(i) Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India. www.beeindia.gov.in.

(ii) Ministry of New and Renewable Energy (MNRE), Government of India. www.mnre.gov.in.

(iii) Uttar Pradesh New and Renewable Energy Agency (UPNEDA), Government of Uttar Pradesh. www.upneda.org.in.

(iv) **Central Pollution Control Board (CPCB),** Ministry of Environment, Forest and Climate Change, Government of India. www.cpcb.nic.in.

(v) Energy Efficiency Sevices Limited (EESL). www.eeslindia.org.

(vi) Electrical India, Magazine on power and electrical products industry. www.electricalindia.in.

5.2 *ENVIRONMENTAL STUDIES

L	T	P
3	-	2

RATIONALE

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the ecosystem and controlling pollution by various control measures. He should also be aware of environmental laws related to the control of pollution. He should know how to manage the waste. Energy conservation is the need of hour. He should know the concept of energy management and its conservation.

LEARNING OUTCOMES

After undergoing the subject, the student will be able to:

- Comprehend the importance of ecosystem and sustainable
- Demonstrate interdisciplinary nature of environmental issues
- Identify different types of environmental pollution and control measures.
- Take corrective measures for the abatement of pollution.
- Explain environmental legislation acts.
- Define energy management, energy conservation and energy efficiency
- Demonstrate positive attitude towards judicious use of energy and environmental protection
- Practice energy efficient techniques in day-to-day life and industrial processes.
- Adopt cleaner productive technologies
- Identify the role of non-conventional energy resources in environmental protection.
- Analyze the impact of human activities on the environment

DETAILED CONTENTS

1. Introduction (04 Periods)
   - 1.1 Basics of ecology, eco system- concept, and sustainable development, Resources renewable and non renewable.
2. Air Pollution (04 Periods)
   - 2.1 Source of air pollution. Effect of air pollution on human health, economy, plant, animals. Air pollution control methods.
3. Water Pollution (08 Periods)
   - 3.1 Impurities in water, Cause of water pollution, Source of water pollution. Effect of water pollution on human health, Concept of dissolved O_2, BOD, COD. Prevention of water pollution- Water treatment processes, Sewage treatment. Water quality standard.

4. Soil Pollution (06 Periods)

4.1 Sources of soil pollution

4.2 Types of Solid waste- House hold, Hospital, From Agriculture, Biomedical, Animal and human, excreta, sediments and E-waste

4.3 Effect of Solid waste

4.4 Disposal of Solid Waste- Solid Waste Management

5. Noise pollution (06 Periods)

Source of noise pollution, Unit of noise, Effect of noise pollution, Acceptable noise level, Different method of minimize noise pollution.

6. Environmental Legislation (08 Periods)

Introduction to Water (Prevention and Control of Pollution) Act 1974, Introduction to Air (Prevention and Control of Pollution) Act 1981 and Environmental Protection Act 1986, Role and Function of State Pollution Control Board and National Green Tribunal (NGT), Environmental Impact Assessment (EIA).

7. Impact of Energy Usage on Environment (06 Periods)

Global Warming, Green House Effect, Depletion of Ozone Layer, Acid Rain. Eco-friendly Material, Recycling of Material, Concept of Green Buildings.

LIST OF PRACTICALS

1. Determination of pH of drinking water
2. Determination of TDS in drinking water
3. Determination of TSS in drinking water
4. Determination of hardness in drinking water
5. Determination of oil & grease in drinking water
6. Determination of alkalinity in drinking water
7. Determination of acidity in drinking water
8. Determination of organic/inorganic solid in drinking water
9. Determination of pH of soil
10. Determination of N&P (Nitrogen & Phosphorus) of soil
11. To measure the noise level in classroom and industry.
12. To segregate the various types of solid waste in a locality.
13. To study the waste management plan of different solid waste
14. To study the effect of melting of floating ice in water due to global warming

INSTRUCTIONAL STRATEGY

In addition to theoretical instructions, different activities pertaining to Environmental Studies like expert lectures, seminars, visits to green house, effluent treatment plant of any industry, rain water harvesting plant etc. may also be organized.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests,
- Mid-term and end-term written tests

RECOMMENDED BOOKS

1. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.
2. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.
3. Environmental Pollution by Dr. RK Khitoliya; S Chand Publishing, New Delhi
4. Environmental Science by Deswal and Deswal; Dhanpat Rai and Co. (P) Ltd. Delhi.
5. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi.
6. Environmental Studies by Erach Bharucha; University Press (India) Private Ltd., Hyderabad.
7. Environmental Engineering and Management by Suresh K Dhamija; S K Kataria and Sons, New Delhi.
8. E-books/e-tools/relevant software to be used as recommended by AICTE/UBTE/NITTTR, Chandigarh.

Websites for Reference:

http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	04	10
2	04	10
3	08	20
4	06	14
5	06	14
6	08	20
7	06	12
Total	**42**	**100**

5.3 EARTHQUAKE ENGINEERING CONCEPT

L	T	P
4	-	-

RATIONALE

In view of earthquake risk in the country, it is important that students of architectural assistantship should have knowledge , concept, and principles of earthquake engineering, so as to built a safe and secure environment for the society .

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1.	Topic 1	2	-	-
2.	Topic 2	8	-	-
3.	Topic 3	12	-	-
4.	Topic 4	6	-	-
5.	Topic 5	6	-	-
6.	Topic 6	4	-	-
7.	Topic 7	4	-	-
8.	Topic 8	4	-	-
9.	Topic 9	10	-	-
		56	-	-

DETAILED CONTENTS

1. NATURE AND CHARACTERISTICS OF GROUND MOTION :

Consequences of earthquake
- Ground rupture and Ground Failure
- Liquefaction
- Land slides, etc.

Ground Motion
- Fire
- Tsunamis

2. ENGINEERING SEISMOLOGY :

- Structure of the earth,
- Plate Tectonics
- Evolution of Indian subcontinent,

- Waves generated by ground motion and their characteristics,
  - Body Waves
    - Longitudinal waves,
    - Transverse waves,
  - Surface waves
    - Rayleigh waves,
    - Love waves,
  - Attenuation of waves,
- Distribution of earthquake
  - Global,
  - Indian,
- Measurement of earthquake
  - Introduction of instruments used for measuring earthquakes
    - Seismograph,
    - Accelerograph,
  - Various scales of magnitude,
  - Various scales of intensity
- Basic Terms
  - Fault line,
  - Focus,
  - Epicenter,
  - Epicenter distance,
  - Focal depth,
  - Peak ground acceleration, etc.
- Seismic Zoning and Micro Zoning.

3. BEHAVIOUR OF BUILDINGS DURING EARTHQUAKE :

- Ground motion and earthquake forces;
- Sitting of structure
- Typology and classification of buildings-
  - Load bearing masonry walls
    - Brick masonry,
    - Stone masonry,
    - Mud
  - Reinforced Concrete Buildings
    - RC framed building
    - RC shear wall building
    - Dual system building
  - Steel Buildings
- Dynamic characteristics of building and its relation with built form

  - Symmetry,
  - Regularity,
  - Stiffness,

    - Flexibility,
    - Strength,
    - Time period,
    - Damping,
    - Ductility,
    - Material and method of construction, etc.
- Earthquake resistance of various forms of building
    - Configuration
        - Scale of building,
        - Size in horizontal plane,
        - Size in vertical plane,
        - Building proportions,
        - Symmetry of the building,
        - Reentrant corners,
        - Redundancy, etc.;
    - Irregularities in Building
        - Horizontal plane,
        - Vertical Plane
    - Building corners
        - Outward corners,
        - Inward corners
- Special Aspects
    - Torsion,
    - Appendages,
    - Staircases,
    - Pounding,
    - Repair and maintenance,
    - Construction management.

4. Behaviour of nonstructural elements in the building during earthquake.
5. Soil characteristics and its impact on various built forms during earthquake.
6. Philosophy of earthquake resistant design of buildings.
7. Earthquake resistant features and use of IS 4326 for masonry buildings.
8. Introduction to ductile detailing of RC buildings as per IS-13920.

9. DISASTER MANAGEMENT:

Definition of disaster - Natural and Manmade, Type of disaster management, how disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National

policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benefit of vulnerability reduction, Factor promoting vulnerability reduction and mitigation, Emergency support function plan.

Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication.

RECOMMENDED BOOKS

1. Arnold C. and Reltherman R., "Building Configuration and Seismic Design", John Wiley and Sons, 1982.
2. Lagorio, H. J., "Earthquake: An Architect's Guide To Nonstructural Seismic Hazards", John Wiley and Sons, 1990.
3. Stratta, J L, " Manual of Seismic Design", Persons Education, New Delhi, 2003 reprint.
4. IIIK-BMTPC Earthquake Tips is a project for twenty four tips of two pages each. Written in simple language. These are available at www.nicee.org for anyone to download. These are very suitable for teachers and students fo polytechnics. Hindi translation of the Tips are expected to become available shortly.

5. Guidelines for Earthquake Resistant Non-Engineered Construction is a publication of the International Association for Earthquake Engineering. This is written in a very simple language targeted at a common man. Soft copy of the same is available at www.nicee.org. Limited number of paper copies may be available free of charge from the National Information Center of Earthquake Engineering (NICEE) and can be requested through an email to nicee@iitk.ac.in. Separate Hindi and English versions of the same are available.

6. A number of reports on past earthquakes are available on internet. NICEE web site has materials on all past earthquakes in recent years in India. NICEE is also distributing of charge two CDS on the Bhuj earthquake: One containing a four hundred page report on a multidisciplinary investigation of the earthquake, and the other containing annotated images of the earthquake for easy presentation.

5.4 ARCHITECTURAL DESIGN-D

L	T	P
4	-	12

RATIONALE

To appreciate the complexities and constraints in the design of a simple building complex comprising two or more individual buildings. The paper-D deals with the design of many more buildings of common/ Public utility and their interior decoration and surrounding landscape design and details.

DETAILED CONTENTS

Three exercises of up to 3-storied buildings of 4 weeks duration each to be done individually. The exercise could be any of the following:
a) Small housing complex.
b) Museum, exhibition centre.
c) Hotel up to 25 rooms.
d) Shopping centre
e) Inter college / Degree College

Special Emphasis to be laid on site planning, landscaping, building Services, Parking.
Note: 1. Case study and library study must be done for each exercise.
Note: 2. Site Visits and related case studies to be carried out

- WORKING DRAWING:

Working drawing of atleast Two design to be prepared. All drawings submitted will be rendered, design seminar be added like IInd year Architectural Design-C.

- MODEL:
One model of a design to be prepared by the students for which materials may be selected out of photographic mount board, Wood, Acrylic sheet to be used for making models.

HVAC SYSTEM (Students should be given brief idea of Heating ,Ventilation and Air-Conditioning system to install and implement in their above mentioned project drawings) :

Comfort cooling system and their working - window ac and split ac. package ac system, Evaporative cooling system, Central air conditioning ; their parts - A.H.U., Cooling plant, Cooling tower.

NOTE : At least one Submission should be drawn on AUTOCAD and to be presented on suitable size of sheet with desired scale.

INSTRUCTIONAL STRATEGY

This is one of the most important practical oriented subject for diploma in architectural assistantship. While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and JohnCallendera

2. Architects Data by Neufert

3. Landscape Architecture by John O. Simonds published by MC. Graw Hill, Book Company
4. Urban Landscape Design by Garnett Eckko Published by M.C. Graw Hill, Book Company
5. Landscape Design that save energy by Anne Simon Majfat & Marc Schiler

6. Flowering trees of India and beautiful gardens of India by M.S. Randhawa

5.5 STRUCTURE - B

L T P
4 2 -

RATIONALE

This subject follows the subject of Applied Mechanics and Structures-A taught during the previous years, the acquired analytical skills of which are applied here to design simple structural elements. A diploma holder in Architectural Assistantship will be required to handle such simple structures in his professional life This subject covers designing of simple structures out of heterogeneous materials (RCC). The student will also learn to use the latest relevant IS codes in their design practice.

(Use of IS:456-2000 is allowed)

TOPIC WISE DISTRIBUTION OF PERIODS

Sr. No.	Concept	L	T	P
1.	Introduction to RCC structures	3	2	
2.	Design based on limit state method			
	I) Fundamentals	6	2	
	II) Singly reinforced beam	3	3	
	III) Lintels	3	3	
	IV) Cantilever beam and slabs	5	2	
	V) Doubly Reinforced Beam	3	2	
	VI) Reinforced concrete Slabs	5	2	
	VII) Reinforced brick work	3	2	
	VIII) Tee beams	5	2	
	IX) Columns & Column Footings	5	2	
3.	Introduction To working stress Method	5	2	
4.	Pre-Stressed Concrete	5	2	
5.	Introduction To Tension & Compression Members	5	2	
		56	28	-

DETAILED CONTENTS

1. INTRODUCTION TO RCC STRUCTURES:

Concept of reinforced concrete structures, advantages and disadvantages. Different materials used in RCC with their properties. Load and loading standard as per IS:875 Concept of design of reinforced concrete based on working stress method and limit state method and their difference.

2 DESIGN BASED ON LIMIT STATE METHOD:

I. Fundamental of limit state method:

(i) Assumptions in the theory of simple bending for RCC beams.

(ii) Flexural strength of a singly reinforced RCC beam.
Position of the Neutral Axis. Resisting moment of the section, critical neutral axis, actual neutral axis, concept of balanced, under reinforced and over-reinforced sections.

(iii) Shear Strength :
Permissible shear stresses as per IS: 456.
Development of stresses in reinforcement, development length and anchoring of bars.

(iv) Bond Strength:
Concept of bond, local and average, permissible bond stresses for plain and deformed bars as per IS, minimum length of embedment of bars, minimum Splice length, actual bond stress in RCC beams and slabs, bond length as per IS: 456.

II. Design of singly reinforced concrete beams as per IS: 456 from the given data such as span load and properties of materials used.

III. Design of lintel.

IV. Design of a cantilever beam and slab.

V. Design of Doubly Reinforced Concrete Beams:

(i) Doubly reinforced concrete beam and its necessity.
(ii) Strength of a double reinforced concrete beam section.
(iii) Method of design: Simple problems only.
(iv) Reinforcement details of doubly reinforced concrete beam.

VI. Design of RCC Slabs:

(i) Structural behaviour of slab under uniformly distributed load (UDL).

(ii) Types of end supports.

(iii) Design of one way slab.

(iv) Design of Two-way slab with the help of tables of IS: 456.(Corners not held down)-IS-code method.

(v) Detailing of reinforcement.

VII. Design of Reinforced Brick-Work

(i) Plain brick masonry, permissible stresses.

(ii) Reinforced Brick work and its use in slabs and lintels.

(iii) Limitations of the use of R.B. Work.

(iv) General principles of design of reinforced brick lintels and slabs.

(v) Design of R.B. slab and lintels.

VIII. Design of Tee Beams:

(i) Structural behaviour of a beam and slab floor laid monolithically.

(ii) Rules for the design of T-Beams.

(iii) Economical depth of T-Beams, Strength of T-Beams.

(iv) Design of Tee-Beams.

(v) Detailing of reinforcement.

IX. Design of Columns & Column Footings

(i) Concept of long and short columns.

(ii) I.S. specifications for main and lateral reinforcement.

(iii) Behaviour of RCC column under axial load.

(iv) Design of Axially loaded short and long columns with hinged ends (circular, square and rectangular as per IS specifications).

(v) Concept of column footing. Design criteria.
Design of square isolated column footings.

(vi) Detailing of reinforcement.

3 DESIGN BASED ON WORKING STRESS METHOD:

Introduction to Limit state design fundamentals, Design of simple problems of beams and slabs only.

4. PRESTRESSED CONCRETE:

Introduction to prestressed concrete.

5. TENSION AND COMPRESSION MEMBERS:
Introduction to tension and compression members of steel roof trusses (No numerical problems should be asked in the examination).

INSTRUCTIONAL STRATEGY

Teachers are expected to give simple problems for designing various RCC structural members. For creating comprehension of the subject, teachers may prepare tutorial sheets, which may be given to the students for solving. It would be advantageous if students are taken at construction site to show form work for RCC as well as placement of reinforcement in various structural members. Commentary on BIS:456 may be referred along with code for relevant clauses.

RECOMMENDED BOOKS

1. Singh Harbhajan "Design of Reinforced Concrete Structures for Architects" Abhishek Publishers, Chandigarh
2. Ramamurtham,S;"Design and Testing of Reinforced Structures", Dhanpat Rai and Sons, Delhi
3.Singh Harbhajan "Limit State Designs for Architects" Abhishek Publishers, Chandigarh
4.Gambhir, M.L., "Reinforced Concrete Design", Macmillan India Limited
5.Singh, Birinder"RCC Design and Drawing", Kaption Publishing House, New Delhi
6.Mallick, SK; and Gupta, AP; "Reinforced Concrete", Oxford and IBH Publishing Co, New Delhi.

5.6 SOFTWARE APPLICATION IN ARCHITECTURE

L	T	P
-	-	8

RATIONALE

To enable the student to develop the confidence to prepare the drawings of a given project through knowledge acquired in previous semester by preparing a set of drawings for any one project. 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 2007 or the latest programme.

DETAILED CONTENTS

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

1. Project (Rendering of CAD drawing) (20 hrs)

The design problem done in 4th semester as main project shall be taken up for preparing a complete set of drawings. These include all plans, elevations (minimum 2) and sections (2 minimum), showing all interior layouts, joinery schedule, tree plantations, parking layout etc.

2. Fundamentals of 3-D Drafting (08 hrs)

2.1 Basic Features
2.2 Coordinate system
2.3 3-D entities and surfaces
Exercises – 1: Converting simple geometric shapes into 3-D Objects

3. Making an existing 2-D plan drawing compatible to 3-D drafting (12 hrs)

3.1 Commands and modifications to 2-D drawings
3.2 B. Poly, rectangle, elevation, extrude – requirements and applications
3.3 3-D of exterior of blocks – preparation, modification of 2-D drawing
3.4 3-D of interiors of block – preparation, modification of 2-D drawings

4. 3-D Modeling (20 hrs)

4.1 Wire frame, surface and 3-D solid modeling
4.2 Viewing 3-D models
4.3 Rendering, shading , hide commands, lights and Camera
4.4 Material representation
4.5 Importing, exporting library and printing 3-D
Exercises – 2: 4th Semester design proposal to be converted in 3-D model

5. Demonstration of 3D max, Corel Draw, Adobe Photoshop as rendering tool for 3D blocks/ walk through etc. (4 hrs)

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 mod

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 be laid in training the students, to avail help from the user friendly software so that they develop confidence and are able to work independently.

Note :- The Board will set the Question Paper for exercises for external examination

SIXTH SEMESTER

6.1 *UNIVERSAL HUMAN VALUES

L- T -P
2- 0 -1

Course Objectives

This introductory course input is intended

1. To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings
2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way
3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature, Thus, this course is intended to provide a much needed orientation input in value education to the young enquiring minds.

Course Methodology

1. The methodology of this course is exploration and thus universally adaptable. It involves a systematic and rational study of the human being vis-à-vis the rest of existence.
2. It is free from any dogma or value prescriptions.
3. It is a process of self-investigation and self-exploration, and not of giving sermons. Whatever is found as truth or reality is stated as a proposal and the students are facilitated to verify it in their own right, based on their Natural Acceptance and subsequent Experiential Validation.
4. This process of self-exploration takes the form of a dialogue between the teacher and the students to begin with, and then to continue within the student leading to continuous self-evolution.
5. This self-exploration also enables them to critically evaluate their pre-conditionings and present beliefs.

The syllabus for the lectures is given below:

- After every two lectures of one hour each, there is one hour practice session.
- The assessment for this subject is as follows:
- Sessions Marks (Internal): 20
- Practical Marks (External): 30
- Total Marks: 50

UNIT 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Understanding the need, basic guidelines, content and process for Value Education
2. Self-Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfill the above human aspirations: understanding and living in harmony at various levels

UNIT 2: Understanding Harmony in the Human Being - Harmony in Myself!

1. Understanding human being as a co-existence of the sentient 'I' and the material the Body'
2. Understanding the needs of Self ('I') and 'Body' - *Sukh* and *Suvidha*
3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
4. Understanding the characteristics and activities of 'I' and harmony in 'I'
5. Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail
6. Programs to ensure *Sanyam* and *Swasthya*
   -Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

1. Understanding Harmony in the family – the basic unit of human interaction
2. Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti;

a. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship

3. Understanding the meaning of Vishwas; Difference between intention and competence
4. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship
5. Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals
6. Visualizing a universal harmonious order in society- Undivided Society (AkhandSamaj), Universal Order (Sarvabhaum Vyawastha)- from family to world family!
   -Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT 4: Understanding Harmony in the Nature and Existence - Whole existence as Co-existence

1. Understanding the harmony in the Nature
2. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature
3. Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
4. Holistic perception of harmony at all levels of existence
   -Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

1. Natural acceptance of human values
2. Definitiveness of Ethical Human Conduct
3. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
4. Competence in professional ethics:

a) Ability to utilize the professional competence for augmenting universal human order
b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,
c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

5. Case studies of typical holistic technologies, management models and production systems
6. Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers
b) At the level of society: as mutually enriching institutions and organizations

7. To inculcate Human Values among Students:The Role of self ,Parents and Teachers
   -Practice Exercises and Case Studies will be taken up in Practice Sessions.

<u>Practical Session also Includes Different Yogic Exercises and Meditation Session</u>

INSTRUCTONAL STRATEGY

The content of this course is to be taught on conceptual basis with plenty of real world examples.

MEANS OF ASSESSMENT

– Assignments and quiz/class tests,
– Mid-term and end-term written tests
– Practical assessment

REFERENCE MATERIAL

The primary resource material for teaching this course consists of

a. The text book (Latest Edition)
R.R Gaur, R Asthana, G P Bagaria, A foundation course in Human Values and professional Ethics, Excel books, New Delhi.

b. The teacher's manual (Latest Edition)
R.R Gaur, R Asthana, G P Bagaria, A foundation course in Human Values and professional Ethics – Teachers Manual, Excel books, New Delhi.

In addition, the following reference books may be found useful for supplementary reading in connection with different parts of the course:

1. B L Bajpai, 2004, *Indian Ethos and Modern Management*, New Royal Book Co., Lucknow. Reprinted 2008.
2. PL Dhar, RR Gaur, 1990, *Science and Humanism*, Commonwealth Purblishers.
3. Sussan George, 1976, *How the Other Half Dies,* Penguin Press. Reprinted 1986, 1991
4. Ivan Illich, 1974, *Energy & Equity,* The Trinity Press, Worcester, and HarperCollins,
USA
5. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III,
1972, limits to Growth, Club of Rome's Report, Universe Books.
6. Subhas Palekar, 2000, *How to practice Natural Farming,* Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
7. A Nagraj, 1998, *Jeevan Vidya ek Parichay,* Divya Path Sansthan, Amarkantak.
8. E.F. Schumacher, 1973, *Small is Beautiful: a study of economics as if peoplemattered*, Blond & Briggs, Britain.
9. A.N. Tripathy, 2003, *Human Values*, New Age International Publishers.

Relevant websites, movies and documentaries

1. Value Education websites, http://uhv.ac.in, *http://www.aktu.ac.in*
2. Story of Stuff, *http://www.storyofstuff.com*
3. Al Gore, *An Inconvenient Truth*, Paramount Classics, USA
4. Charlie Chaplin, *Modern Times*, United Artists, USA
5. IIT Delhi, *Modern Technology–the Untold Story*
6. Case study Hevade Bazar Movie
7. RC Shekhar , Ethical Contradiction ,Trident New Delhi
8. *Gandhi A., Right Here Right Now, Cyclewala Production*

6.2 CONSTRUCTION MANAGEMENT, ACCOUNTS AND PROFESSIONAL PRACTICE

[Common to three year Diploma Course in Interior Design & Decoration]

L T P
6 2 -

RATIONALE

This paper aims to develop the students as professional architects to face the challenges in the world of work. To face these challenges,they should have thorough knowledge of various Architect's Act, Code of conduct in effect, handling the accounts and personnel management. The paper is expected to fulfill such a need.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Management	25	8	-
2.	Accounts	25	8	-
3.	Professional Practice	25	8	-
4.	Intellectual Property Rights	9	4	-
		84	28	-

DETAILED CONTENTS

1. MANAGEMENT:

Introduction, Classification of construction - Light and Heavy, Stages of construction, Construction team - Owner, Engineer and Contractor their functions and interrelationship, Resources of construction industry -Man, Material, Machine, Money. Functions of construction management, Planning, Organization and building contracts. Aquaintance with building bye-laws (R.B.O. Act), Accident and Safety.

2. ACCOUNTS:

Introduction, Necessity of accounts, Cash - Definition of cash, Treasury challan and its Procedure of filling Imprest account.

3. PROFESSIONAL PRACTICES:

Introduction, Code of practice, Scale of charges, Code of conduct as per Architects Act-1972, Council of Architects, Tender documents, Stages of payments, Settlement of disputes and arbitrations.

4. INTELLECTUAL PROPERTY RIGHTS :

Introduction to IPR (Patents, Copy Right, Trade Mark), Protection of undisclosed information, Concept and history of patents, Indian and International Patents Acts and Rules, Patentable and Non patentable invention including product versus Process. Basic terms used in land acquisition, Khasra, Khatauni, possession, allotment, free hold, Mutation (Dakhil-Kharij)

RECOMMENDED BOOKS

1- Construction planning and Management by Ketaki B. Dalal & Rangwala, charotar publishing house Pvt. Ltd.
2- Construction Engineering and Management of project by S.C.Sharma ,Khanna Publishers .
3- Professional practice by K.G. Krishnamurthy, and S.V.Ravindra : Published by prentice hall India learning Pvt. Ltd.
4- Professional Practice of Architecture by Prof. S.C. Garg and Dr. Yogesh K.Garg, Satya publishers , New Delhi .
5- The Architecture student's handbook of professional practice published by John Wiley and sons, New Jersey, United States.

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	33	30
2	33	30
3	33	30
4	13	10
Total	**112**	**100**

6.3 CONSTRUCTION AND MATERIALS - lll

L	T	P
6	-	4

RATIONALE

The fundamentals of the paper has already been dealt within the previous years and the students are aware of the materials and construction principles involved. With the development of the technology, many a more materials have come up. Their use in modern architecture is inevitable, so to keep their knowledge is also vital. These materials have been given place in this paper to remain updated with the complete knowledge.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	L	T	P
1.	Materials	12	-	8
2.	Foundations	12	-	8
3.	Temporary Work	12	-	8
4.	Roofs	12	-	8
5.	Partitions	12	-	8
6.	Interiors	16	-	12
7.	Hardware and Construction Equipments	08	-	4
		84	-	56

DETAILED CONTENTS

1. MATERIALS:

R.C.C. as structural material, acoustical and insulating materials, Finishing veneer's, cladding and paneling, Jali and Hollow Brick work, M.S. Grill work, Aluminium Composite Panel (ACP), Different types of adhesives Painting/ Polishing material- Lime/ Colour wash, Dry distemper, Oil-bound distemper, Cement paints, Acrylic emulsions, Synthetic enamels, Wall texture etc. Polishes and Varnishes.

2. FOUNDATIONS:

R.C.C. independent footing, Raft foundation, Pile foundation, Grillage Foundation.

3. TEMPORARY WORK:

Timbering in trenches, Shoring, under pinning scaffolding, shuttering and form work for R.C.C., Centering for arches.

4. ROOFS:

R.C.C. and R.B. slabs, Cantilevers, portico, Projections, Balcony, Treatment of expansion joints.

5. PARTITIONS:

Constructional details, Suitability and uses of Brick, Wooden, Glazed, Semi-glazed partition walls, details of false ceiling and paneling in various materials.

6. INTERIORS:

An introduction to furniture, built-in-furniture and interior details in designing residential and commercial furnitures.

Modern: various types of new building materials mentioned along with specifications be included from time to time as an advance study to upgrade subject.

Studies with models, visits to Five-Star Hotels or similar building sites, the studio periods should be devoted to preparation of detailed construction drawings.

7. HARDWARE AND CONSTRUCTION EQIUPMENTS:

HARDWARE:

Hinges, Handles, Knobs, Bolts, L-drop, Locks, Stoppers, Stays, Silencers, Chain guards, Closers, Catchers, Knockers, etc in various materials, Patch fittings for glazed shutters.

CONSTRUCTION EQUIPMENTS :

Electric Hand Tools : Vibrators, Pumps, Compactors/Rollers. Earth Moving and Excavation : Dozers, Scrapers, Graders, Shovels, Backactor, Dragline, Trenchers.

Transportation: Lorries, Trucks, Dumpers, Hoist, Cranes (Mobile, Static, Tower), Concrete mixers and pumps for ready mix concrete.

RECOMMENDED BOOKS

1. Building Construction by WB Mackay; Khanna Publisher, New Delhi
2. Building Construction by SP Bindra and SP Arora; ; publisher Dhanpat Rai & Co. New Delhi
3. Building Construction by BC Punmia; Publisher Laxmi Publication, New Delhi
4. Building Construction by Sushil Kumar; Standard Publisher, New Delhi
5. Construction of Buildings (Vol I and II) by Barry
6. Building Construction by VB Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
7. Building Construction by Rangwala; Publisher Charotar Publishing House Pvt. Ltd., New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Unit	**Time Allotted (Periods)**	**Marks Allotted (%)**
1	20	15
2	20	15
3	20	10
4	20	15
5	20	15
6	28	20
7	12	10
Total	**140**	**100**

6.4 PORTFOLIO (PROJECT WORK)

L	T	P
4	-	16

1. DESIGN PROJECT:-

The project will be of 4 months duration. The main emphasis will be on developing the problem coordinating various factors affecting the design. It will be supported by discussions and seminars from time to time.

The Project will include the following:-

(a) Presentation drawing and working drawings and details.

(b) Details of all connected services e.g. Water supply, sanitation work and drainage; with knowledge of latest inventions in the field of water supply and sanitary fittings.

(c) Three dimensional presentation.

(i) Model or Block Models.

(ii) Perspectives.

(d) Details of all connected services, e.g. electrical wiring and decorative electrical installations and fixtures

(e) Viva-Voce.

The project should be divided in three stages.

(a) Site Analysis/ Requirements/ Climate - after 1 month (30% Marks)

(b) Sketch design. - after 2 months (30% Marks)

(c) Final design with report - after 4 months (Including One sheet of Detailed working drawing in pencil). (40% Marks)

All these stages (which may have some incomplete sheets) will be presented by the students to a jury consisting of at least one external member nominated by the institute, that may be a practicing Architect/ Teacher of Architectural institution. The given shall have to be divided in all the three stages, which shall be combined together at the end as internal assessment marks. (The expenditure incurred on calling the experts will be borne by the institution).

NOTE :

In the design project : Scope and limitations of design topic, size of the project, types of the project etc shall be finalized after discussion between teachers and student.

The drawings of complete project has to be prepared and presented on AUTOCAD (This is mandatory for all students).

10. RESOURCE REQUIREMENT:

10.1 Physical Resources:

10.1.1 Total Space Requirements

The total space for lecture room, tutorial rooms and drawing halls is work out by using following formula as per AICTE norms for all five disciplines i.e. civil, electrical, mechanical, automobile engineering and architectural assistantship

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N = (Ns/Cs)(H/Hw)(1/fu) where

N = Number of rooms required for each type.
N may be number of class rooms(Nc),
Number of tutorial rooms (Nt) or
Number of drawing halls (Nd)

Ns = Total Number of students in all years/semesters/disciplines

Cs = Class size (Number of students)

H = Number of hours per week of class room, lecture, tutorial or drawing as the case may be

Hw = Number of working hours per week

Fu = Utilisation factor (taken as 0.75)
Number of class rooms Nc = 10
Number of Tutorial rooms Nt = 2
Number of Drawing Halls Nd = 6

Space for Laboratories and workshops may be worked out as per AICTE norms(1995).

Note: A separate space and infrastructure for Art Studio is recommended for Architectural Assistantship department.

10.1.2 Equipment requirement:

1. Name of Laboratory: Drafting Studio

Sr No	Particular	Qty.	Tentative Cost (Rs)
1.1	Adjustable drafting machines, AO size with drafter and adjustable revolving stools	20	80,000
a.	Soft board panels for pining drawing 4'x 8', 3/4" thick	04	2,000
b.	Rapidograph pens (set of 8 pens) (Rotering)	04	10,000
1.4	Set up templates (for lettering, furniture, sanitary, geometric forms, kitchen, electric symbols)	04 each	1,600
1.5	Drawing instrument box (Stadtler) set of 12 pieces	04 set	2,000
1.6	Beam compass 36" long	04	400
1.7	Miscellaneous drawing equipment: Scales, french curves, different kind of colours (water, oil and poster) brushes of different sizes, coloured inks, clutch pencils, razors, mixing Pallets, cutters for model making, vanishing stick, spray gun, drawing sheets etc.	LS	5,000
	Total		**1,01,000**

2. Name of Laboratory/Workshop : Art Studio

2.1	Donkey 1' x 3' with stand for sketch book	20	12,000
2.2	Wooden platform (revolving) for life study	01	1,500
2.3	Still life stand	02	1,000
2.4	Reflector with stand	02	5,000
2.5	Draperies for still life and model drawing	LS	2,500
2.6	Still life objects made of different materials	LS	5,000
2.7	Other miscellaneous items like: Calligraphy pen set, instrument box, inking pens, french curves, scissors, steel rules, mount cutters, pencils, erasers, sketch pens, brushes and papers, inks drawing pins, palettes etc.	LS	20,100
	Total		**47,100**

3. Name of Laboratory/Workshop : Materials and Building Museum

Sr No.	Particulars	Qty.	Tentative Cost (Rs)
3.1	Different types of bricks		
3.2	Different types of building stones		
3.3	Different types of sands		
3.4	Different types of paints and distempers		
3.5	Different types of wood		
3.6	Different types of wood products		
3.7	Different types of glass samples		
3.8	Different types of fasteners and adhesives		
3.9	Different types of sanitary wares		
3.10	Samples of plumbing, fixtures to be installed as working Prototypes	LS	1,00,000
3.11	Samples of electric wires and conducting materials		
3.12	Samples of electric fixtures and fittings		
3.13	Samples of floor finishes and wall finishes		
3.14	Samples of different roofing materials		
3.15	Samples of false ceiling fixtures and finishes		
3.16	Samples of acoustics materials		
3.17	Samples of thermal insulating materials		
3.18	Samples of building hard ware		
3.19	Models, charts and other teaching aids		
	Total		**1,00,000**

4. Name of Laboratory/Workshop: Workshops

Carpentry Shop

4.1 Jig saw, 300 mm x 300 mm with 1/2 horse power motor	1	4,500
4.2 Wood planner, 2 horse power, 440 volts, width of plank 300 mm and length of table 1100 mm	1	15,000
4.3 Drilling machine, bench type 600x4000 rpm, size of table 250x250 mm	1	8,000
4.4 Universal wood working machine - 14 in one	1	1,50,000
4.5 Bench grinder	1	5,000
4.6 Carpentry work benches 4'x8'	10	20,000
4.7 Chain and chiesel mortising machine	1	25,000

Sr No	Particulars	Qty.	Tentative Cost (Rs)
4.8	Wood turning lathe	1	10,000
4.9	Vertical sander	1	10,000
4.10	Carpentry hand tools, vices, holds, gauges and measuring tools	LS	35,000
4.11	Cutters, saws, blades for Acrilic Model Making	LS	10,000

Welding Shop

4.11 Oil cooled arc welding transformer, 3-phase with standard accessories	1	4,000
4.12 M-4 Bench Spot welder	1	5,000
4.13 Oxy-acetylene gas welding set	1	12,000
4.14 Brazing equipment and accessories	1	5,000

Painting Shop

4.15 Spray painting gun with a small compressor	1	5,000
4.16 Miscellaneous painting brushes and materials	LS	500

Electrical Shop

4.17 General hand tools i.e. Screw driver sets, pliers, wrenches, tweezers, workshop scissors, hand drill machine, chisel, hammers	LS	5,000
4.18 Different types of wires, conduits, batteries, switches and other fixtures, testers, soldering iron	LS	10,000
	Total	**3,39,000**

5. Name of Laboratory/Workshop : Building Yard

5.1 The material required for Building Yard is mostly bricks, stones, cement, sand, mason tools, mild steel rods and timber planks	LS	5,000
	Total	**5,000**

6. Name of Laboratory/Workshop : Survey Laboratory

Sr No	**Particulars**	**Qty.**	**Tentative Cost (Rs)**
6.1	Metric Chain 20 m length and set of arrows as per IS 1492	08	1,600
6.2	Metallic tape 20 m length in leather case and winding device as per IS 1492	06	1,200
6.3	Ranging rods made of conduit pipe 30 mm dia painted white and black with iron shoe	25	2,500
6.4	Optical square, prism type as per IS 7009	06	1,200
6.5	Prismatic Compass as per IS 1957 100m diameter made of brass	06	4,200
6.6	Plane table with all accessories as per IS 2539	06	7,200
6.7	Dumpy level as per IS 9613, Telescope lens 300 mm with plate bubble	06	13,200
6.8	Levelling staff, telescope type, 4m long	05	5,000
6.9	Transit vernier theodolite telescope lens 150-210 mm magnification 25 to 30 x Minimum focusing distance 1.5 m	02	20,000
		Total	**56,100**

7. Name of Laboratory/Workshop : Computer Laboratory

7.1 Intel Pentium-4 @ 1.4 GHz, Mother Board D 850 GB,400 Mhz FSB, Intel 850 Chipset, Ultra 100 ATA, 256 MB RDRAM, AGP Card, 4 MB RAM 20 GB ULTRA ATA 100, 7200 RPM, IDE HDD, 1.44 MB 3.5" FDD, 52 x CDROM drive with MM kit, Multimedia Key Board, Mouse Logitech, Modem, 15" Color Monitor Digital, Dual Speed 10/10 Mbps Fast Eathernet CARD, Pair of Speakers, Integrated video and audio ISO 9002 certified, Y2K Certified or the latest high speed and high memory PC systems		20 Nos.
7.2 Laser Printer HP 1200 series or Equivalent UPS 0.652 Kw (one for each system)		1 No.
7.3 Software: DOS Wordprocessor, Spread sheet Storyboard, Autocad	LS	3,00,000

Sr No	Particulars	Qty.	Tentative Cost (Rs)
7.4	Video LCD Projector	1	2,40,000
7.5	Computer Furniture	10	20,000

Total 6,60,000

8. Name of Laboratory/Workshop : Reprographic & AV Cell

8.1 Electronic stencil cutting machine (with 2 speeds 300/600 rpm 230V)	01	30,000
8.2 Photocopier (1.5 kw, 240 V, 50 Hz, warm Uptime 60 sec, 240 paper capacity 2000 sheets)	01	90,000
8.3 Duplicating machine electric operated	01	20,000
8.4 Overhead Projector (240 V, 650 W, focal length 254 mm at f/2.86, lens dia 90mm)	01	5,000
8.5 TV & VCR with remote control set	01	40,000
8.6 Automatic slide projector (240 W)	01	5,000
8.7 Ammonia printing machine with auto time switch	01	8,000

8.8 Glass Top Tracing Table		01	3,000
8.9 Edge binding machine, trimming machine and large stapler		LS	2,000
8.10 Drawing Sheet (4 Nos)		LS	12,000
	Total		**2,15,000**

NOTE:

In addition to the above, laboratories in respect of physics, chemistry, applied mechanicsstrength of materials, general engineering, workshops, Computer Centre etc will be required for effective implementation of the course. Provision for overhead projector, TV with VCR facility, slide cum strip projector, 16 mm film projector, photocopier, PC-XT facilities, duplicating machines, drafting machines etc has also to be made.

10.3 Furniture Requirement

Norms and standards laid down by AICTE be followed for working out furniture requirement for this course

10.4 Human Resources:

Weekly work schedule, annual work schedule, student teacher ratio for various group and class size, staffing pattern, work load norms, qualifications, experience and job description of teaching staff workshop staff and other administrative and supporting staff be worked out as per norms and standards laid down by the AICTE.

11. EVALUATION STRATEGY

11.1 INTRODUCTION

Evaluation plays an important role in the teaching-learning process. The major objective of any teaching-learning endeavor is to ensure the quality of the product which can be assessed through learner's evaluation.

The purpose of student evaluation is to determine the extent to which the general and the specific objectives of curriculum have been achieved. Student evaluation is also important from the point of view of ascertaining the quality of instructional processes and to get feedback for curriculum improvement. It helps the teachers in determining the level of appropriateness of teaching experiences provided to learners to meet their individual and professional needs. Evaluation also helps in diagnosing learning difficulties of the students. Evaluation is of two types: Formative and Summative (Internal and External Evaluation)

Formative Evaluation

It is an on-going evaluation process. Its purpose is to provide continuous and comprehensive feedback to students and teachers concerning teaching-learning process. It provides corrective steps to be taken to account for curricular as well as co-curricular aspects.

Summative Evaluation

It is carried out at the end of a unit of instruction like topic, subject, semester or year.The main purpose of summative evaluation is to measure achievement for assigning course grades, certification of students and ascertaining accountability of instructional process. The student evaluation has to be done in a comprehensive and systematic manner since any mistake or lacuna is likely to affect the future of students.

In the present educational scenario in India, where summative evaluation plays an important role in educational process, there is a need to improve the standard of summative evaluation with a view to bring validity and reliability in the end-term examination system for achieving objectivity and efficiency in evaluation.

11.2 STUDENTS' EVALUATION AREAS

The student evaluation is carried out for the following areas:

- Theory
- Practical Work (Laboratory, Workshop, Field Exercises)
- Project Work
- Professional Industrial Training

A. Theory

Evaluation in theory aims at assessing students' understanding of concepts, principles and procedures related to a course/subject, and their ability to apply learnt principles and solve problems. The formative evaluation for theory subjects may be caused through sessional /class-tests, home-assignments, tutorial-work, seminars, and group discussions etc. For end-term evaluation of theory, the question paper may comprise of three sections.

Section-I

It should contain objective type items e.g. multiple choice, matching and completion type. Total weightage to Section-1 should be of the order of 20 percent of the total marks and no choice should be given in this section. The objective type items should be used to evaluate students' performance in knowledge, comprehension and at the most application domains only.

Section-II

It should contain short answer/completion items. The weightage to this section should be of the order of 40 percent of the total marks. Again, no choice should be given in section-II

Section-III

It may contain two to three essay type questions. Total weightage to this section should be of the order of 40 percent of the total marks. Some built-in, internal choice of about 50 percent of the questions set, can be given in this section

Table II : Suggested Weightage to be given to different ability levels

Abilities	Weightage to be assigned
Knowledge	10-30 percent
Comprehension	40-60 percent
Application	20-30 percent
Higher than application i.e. Analysis, Synthesis and Evaluation	Upto 10 percent

B. Practical Work

Evaluation of students performance in practical work (Laboratory experiments, Workshop practicals/field exercises) aims at assessing students ability to apply or practice learnt concepts, principles and procedures, manipulative skills, ability to observe and record, ability to interpret and draw conclusions and work related attitudes. Formative and summative evaluation may comprise of weightages to performance on task, quality of product, general behaviour and it should be followed by viva-voce.

C. Project Work

The purpose of evaluation of project work is to assess students ability to apply, in an integrated manner, learnt knowledge and skills in solving real life problems, manipulative skills, ability to observe, record, creativity and communication skills. The formative and summative evaluation may comprise of weightage to nature of project, quality of product, quality of report and quality of presentation followed by viva-voce.

D. Professional Industrial Training

Evaluation of professional industrial training report and viva-voce/ presentation aims at assessing students' understanding of materials, industrial processes, practices in the industry/field and their ability to engage in activities related to problem-solving in industrial setting as well as understanding of application of learnt knowledge and skills in real life situation. The formative and summative evaluation may comprise of weightages to performance in testing, general behaviour, quality of report and presentation during viva-voce.

12 -RECOMMENDATIONS FOR EFFECTIVE CURRICULUM IMPLEMENTATION

This curriculum document is a Plan of Action and has been prepared based on exhaustive exercise of curriculum planning and design. The representative sample comprising selected senior personnel (lecturers and HODs) from various institutions and experts from industry/field have been involved in curriculum design process.

The document so prepared is now ready for its implementation. It is the faculty of polytechnics who have to play a vital role in planning instructional experiences for the courses in four different environments viz. class-room, laboratory, library and field and execute them in right perspective. It is emphasized that a proper mix of different teaching methods in all these places of instruction only can bring the changes in stipulated student's behaviour as in the curriculum document. It is important for the teachers to understand curriculum document holistically and further be aware of intricacies of teaching-learning process (T-L) for achieving curriculum objectives. Given below are certain suggestions which may help the teachers in planning and designing learning experiences effectively. These are indicative in nature and teachers using their creativity can further develop/refine them. The designers of the programme suggest every teacher to read them carefully, comprehend and start using them.

(A) Broad Suggestions:

1- Curriculum implementation takes place at programme, course and class-room level respectively and synchronization among them is required for its success. The first step towards achieving synchronization is to read curriculum document holistically and understand its rationale and philosophy.

2. An academic plan needs to be prepared and made available to all polytechnics well in advance. The Principals have a great role to play in its dissemination and, percolation upto grass-root level. Polytechnics, in turn are supposed to prepare institutional academic plan.

3. HOD of every Programme Department along with HODs and in-charge of other departments are required to prepare academic plan at department level referring to institutional academic plan.

4. All lecturers/Senior lecturers are required to prepare course level and class level lesson plans referring departmental academic plan.

(B) Course Level Suggestions

Teachers are educational managers at class room level and their success in achieving course level objectives lies in using course plan and their judicious execution which is very important for the success of programme by achieving its objectives.

Polytechnic teachers are required to plan various instructional experiences viz. theory lecture, expert lectures, lab/workshop practical, guided library exercises, field visits, study tours, camps etc. In addition, they have to carry out progressive assessment of theory, assignments, library, practical and field experiences. Teachers are also required to do all these activities within a stipulated period of time. It is essential for them to use the given time judiciously by planning all above activities properly and ensure execution of the plan effectively.

Following is the gist of suggestions for subject teachers to carry out T-L process effectively:

1. Teachers are required to prepare a course plan, taking into account departmental academic plan, number of weeks available and courses to be taught.

2. Teachers are required to prepare lesson plan for every theory class. This plan may comprise of contents to be covered, learning material for execution of a lesson plan. They may follow steps for preparing lesson plan e.g. drawing attention, state instructional objectives, help in recalling pre-requisite knowledge, deliver planned subject content, check desired learning outcomes and reinforce learning etc.

3. Teachers are required to plan for expert lectures from field/industry. Necessary steps are to plan in advance, identify field experts, make correspondence to invite them, take necessary budgetary approval etc.

4. Teachers are required to plan for guided library exercises by identification of course specific experience requirement, setting time, assessment, etc. The assignments and seminars can be thought of as terminal outcome of library experiences.

5. Concept and content based field visits may be planned and executed for such content of course which is abstract in nature and no other requisite resources are readily available in institute to impart them effectively.

6. There is a dire need for planning practical experiences in right perspective. These slots in a course are the avenues to use problem based learning/activity learning/ experiential learning approach effectively. The development of lab instruction sheets for the course is a good beginning to provide lab experiences effectively.

7. Planning of progressive assessment encompasses periodical assessment in a semester, preparation of proper quality question paper, assessment of answer sheets immediately and giving constructive feed back to every student

8. The student centered activities may be used to develop generic skills like task management, problem solving, managing self, collaborating with others etc.

9. Where ever possible, it is essential to use activity based learning rather than relying on delivery based conventional teaching all the time.

10. Teachers may take initiative in establishing liaison with industries and field organizations for imparting field experiences to their students.

11. Students be made aware about issues related to ecology and environment, safety, concern for wastage of energy and other resources etc.

12. Students may be given relevant and well thought out project assignments, which are purposeful and develop practical skills. This will help students in developing creativity and confidence for their gainful employment.

13. A Project bank may be developed by the concerned department of the polytechnics in consultation with related Industry, research institutes and other relevant field organizations in the state.

The following experts have participated in workshop for Developing Curriculum Scheme / Competency Profile / Contents of 1st and 2nd Semester's subjects of diploma course in Architectural Assistantship for UP State on -14th Oct., 2019 at Govt. Polytechnic, Lucknow :

1. Ar. Vijay Kumar Singh, Principal, Govt. Polytechnic, Faizabad
2. Ar Indrajeet Sachan , HOD, Architecture, Government Polytechnic, Hardoi
3. Sh. Alok Srivastava, HOD, Civil Engg., Government Polytechnic, Shahjahanpur
4. Ar. Kuldeep Srivastava, Lecturer, Architecture, Government Polytechnic, Lucknow
5. Sh. Shailendra Pratap Singh, Lecturer, Civil Engg., Government Polytechnic, Lucknow
6. Ar. Varsha Yadav, Lecturer, Architecture, Government Girls Polytechnic, Lucknow
7. Ar. Ruchi Singh, Lecturer, Architecture, Government Girls Polytechnic, Lucknow
8. Sh. Ashok Kushwaha, Text Book Officer, I.R.D.T., Kanpur
9. Ar. Vikas Kulshreshtha, Asstt. Prof., I.R.D.T., Kanpur

The following experts have participated/ contributed in workshop for Developing Curriculum Scheme / Competency Profile / Contents of 3rd , 4th ,5th and 6th Semester's subjects of diploma course in Architectural Assistantship for UP State through online platform and digital communication mediums:

1. Ar. Vijay Kumar Singh, Principal, Govt. Polytechnic, Faizabad
2. Ar. Gaurav Chandra, HOD, Architecture, A.I.T.H., Kanpur.
3. Ar Indrajeet Sachan , HOD, Architecture, Government Polytechnic, Hardoi
4. Ar. Kuldeep Srivastava, Lecturer, Architecture, Government Polytechnic, Lucknow
5. Ar. Varsha Yadav, Lecturer, Architecture, Government Girls Polytechnic,Lucknow
6. Ar. Ruchi Singh, Lecturer, Architecture, Government Girls Polytechnic, Lucknow
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