

CURRICULUM FOR THREE YEAR  
(SIX SEMESTER)  
DIPLOMA COURSE IN

=====  
: ARCHITECTURAL ASSISTANTSHIP :  
: Effective from Session :  
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=====  
:Semester System :  
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Prepared By

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: Curriculum Development Cell :  
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INSTITUTE OF RESEARCH DEVELOPMENT  
& TRAINING, U.P., KANPUR

APPROVED BY

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: BOARD OF TECHNICAL EDUCATION :  
: U.P. LUCKNOW, :  
:CORRECTED AS SYLLABUS COMMITTEE OF:  
: B.T.E. MEETING HELD ON 19.04.2017  
=====

STUDY AND EVALUATION SCHEME FOR  
THREE YEAR (SIX SEMESTER) DIPLOMA COURSE IN ARCHITECTURAL ASSISTANTSHIP

(Effective from the session 200 - 200 )

I SEMESTER :

STUDY SCHEME						S U B J E C T S	SCHEME OF EXAMINATION							
PERIODS PER WEEK							T H E O R Y			P R A C T I C A L				
Lect	Tut.	Dra -w	Pract	W/s	Total		Examination ----- Dur.	Sessl Marks	Total Marks	Examination ----- Dur.	Sessl Marks	Total Marks	Grand Total	
4	-	-	-	-	4	1.1. Foundational Communication	2.5	50	20	70	-	-	-	70
3	1	-	-	-	4	1.2. Applied Mathematics-I(A)	2.5	50	20	70	-	-	-	70
3	1	-	-	-	4	1.3. Applied Physics-I	2.5	50	20	70	-	-	-	70
6	-	-	-	-	6	1.4. Applied Chemistry	2.5	50	20	70	-	-	-	70
4	-	8	-	-	12	1.5. Graphics Presentation & Art	4.0	125	50	175	-	-	-	175
2	-	-	5	-	7	1.6. Introduction To Computer	-	-	-	3	60	30	90	90
22	2	8	5	-	37	T O T A L	-	325	130	455	-	60	30	545
Games/NCC/Social & Cultural activity/Community Development+Discipline (30+20)												25		
TOTAL												570		

II SEMESTER :

3	1	-	-	-	4	2.1. Applied Mathematics-I(B)	2.5	50	20	70	-	-	-	70
3	1	-	4	-	8	2.2. Applied Physics-II	2.5	50	20	70	3	40	20	130
5	1	-	2	-	8	2.3. Applied Mechanics.	2.5	50	20	70	3	40	20	130
2	-	8	-	-	10	2.4. Architectural Design-A (Basic Design)	4	125	50	175	-	-	-	175
3	-	3	-	-	6	2.5. Construction & Material-A	2.5	50	20	70	-	-	-	70
-	-	-	-	12	12	2.6. El. Workshop Practice	-	-	-	4	60	30	90	90
16	3	11	6	12	48	T O T A L	-	325	130	455	-	140	70	665
Games/NCC/Social & Cultural activity/Community Development+Discipline (15+10)												25		
TOTAL												690		

- NOTE: (i) Each period will be of 50 minutes duration.  
(ii) Each semester will be of 16 weeks.  
(iii) Effective teaching will be atleast 14 weeks.  
(iv) Remaining periods will be utilized for revision, Field Visit and organising seminars, etc.  
(v) SI system of units shall be used in each subject.  
(vi) Periods required for library consultation/study may be arranged from architectural design periods at institute level.

STUDY AND EVALUATION SCHEME FOR  
THREE YEAR (SIX SEMESTER) DIPLOMA COURSE IN ARCHITECTURAL ASSISTANTSHIP  
(Effective from the session 200 -200 )

III SEMESTER :

STUDY SCHEME						S U B J E C T S	SCHEME OF EXAMINATION							
PERIODS PER WEEK							T H E O R Y			P R A C T I C A L				
Lect	Tut.	Dra -w	Pract	W/s	Total		Examination Dur.	Sessl Marks	Total Marks	Examination Dur.	Sessl Marks	Total Marks	Grand Total	
5	2	-	-	-	7	3.1. Building Science(Climatology,P.H.E. & Elect. Services	2.5	100	40	140	-	-	-	140
3	2	-	-	-	5	3.2. History of Architecture-A	2.5	50	20	70	-	-	-	70
6	-	-	14	-	20	3.3. Surveying	2.5	50	20	70	3	60	30	160
3	-	3	-	-	6	3.4. Construction & Material-B	2.5	75	30	105	-	-	-	105
-	-	-	8	-	8	3.5. Computer Aided Design	2.5	--	--	--	3	60	40	100
17	4	3	22	-	46	T O T A L	-	275	110	385	120	70	190	575
Games/NCC/Social & Cultural activity/Community Development+Discipline (15+10)												25		
TOTAL												600		

IV SEMESTER :

4	-	-	-	-	4	4.1 Functional Communication	2.5	50	20	70	-	-	-	70
3	2	-	-	-	5	4.2 Town Planning	2.5	50	20	70	-	-	-	70
5	2	-	-	-	7	4.3. Structure-A	2.5	75	30	105	-	-	-	105
4	3	-	-	-	7	4.4 Estimating, Costing & Spec.	2.5	75	30	105	-	-	-	105
3	2	-	-	-	5	4.5. History of Architecture-B	2.5	50	20	70	-	-	-	70
4	-	16	-	-	20	4.6 Architectural Design-B I. Studio Work II. Perspective & Sciography III. Interior Schemes IV. Model V. Computer graphics	12	175	70	245	-	-	-	245
23	9	16	-	-	48	T O T A L	-	475	190	665	--	--	--	665
Games/NCC/Social & Cultural activity/Community Development+Discipline (15+10)												25		
TOTAL												690		

- NOTE: (i) Each period will be of 50 minutes duration.  
(ii) Each semester will be of 16 weeks.  
(iii) Effective teaching will be atleast 14 weeks.  
(iv) Remaining periods will be utilized for revision, Field Visit and organising seminars, etc.  
(v) SI system of units shall be used in each subject.  
(vi) 4 Week structured and supervised branch specific, task oriented industrial/field exposure to be organised after IV semester. Students will submit a report. This will be examined by project examiner in the VI Semester.  
(vii) Periods required for library consultation/study may be arranged from architectural design periods at institute level.

STUDY AND EVALUATION SCHEME FOR  
THREE YEAR (SIX SEMESTER) DIPLOMA COURSE IN ARCHITECTURAL ASSISTANTSHIP  
(Effective from the session 200 -200 )

V SEMESTER :

STUDY SCHEME						S U B J E C T S	SCHEME OF EXAMINATION							
PERIODS PER WEEK							T H E O R Y			P R A C T I C A L				
Lect	Tut.	Dra -w	Pract	W/s	Total		Examination ----- Dur.   Marks	Sessl Marks	Total Marks	Examination ----- Dur.   Marks	Sessl Marks	Total Marks	Grand Total	
-	-	-	4	-	4	5.1. Integrative Communication	--	--	--	3	40	20	60	60
4	-	20	-	-	24	5.2. Architectural Design-C I. Studio Work II. Working Drawing III. Interior Schemes & Architectural forms IV. Models V. Computer Graphics	12	180	70	250	-	-	-	250
3	1	-	-	-	4	5.3. Earthquake Engineering Con.	2.5	50	20	70	-	-	-	70
5	3	-	-	-	8	5.4. Structure-B	2.5	75	30	105	-	-	-	105
4	1	-	-	-	5	5.5. Environmental Pollution & Control	2.5	50	20	70	-	-	-	70
16	5	20	4	-	45	T O T A L	-	355	140	495	40	20	60	555

Games/NCC/Social & Cultural activity/Community Development+Discipline (15+10) 25  
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TOTAL 580

VI SEMESTER :

6	-	4	-	-	10	6.1. Construction & Material-C	2.5	75	30	105	-	-	-	105
6	2	-	-	-	8	6.2. Mgt. Accounts & Prof. Pract.	2.5	50	20	70	-	-	-	70
2	-	8	-	-	10	6.3. Project (Viva-voce)	-	-	-	-	100	50	150	150
-	-	-	-	-	-	i. Viva-Voce	-	-	-	-	50	30	80	80
-	2	-	-	-	2	ii. Field Exposure (Done in Iv sem.)	-	-	-	-	-	-	-	-
14	4	12	-	-	30	T O T A L	125	50	175	150	80	230	405	

Games/NCC/Social & Cultural activity/Community Development+Discipline (15+10) 25  
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TOTAL 430

30% of I & II Sem 378  
70% of III & IV Sem. 903  
100% of V & VI Sem. 1010  
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- NOTE: (i) Each period will be of 50 minutes duration.  
(ii) Each semester will be of 16 weeks.  
(iii) Effective teaching will be atleast 14 weeks.  
(iv) Remaining periods will be utilized for revision, Field visit, Seminars, etc.  
(v) 4 Week structured and supervised, task oriented field exposure to be organized during after IV Semester. Students will submit a report. This will be examined by project examiner in VI Semester  
(vii) Each Student/group of 4 to 6 student will be given a problem to be solved. 4 periods per week has been provided in the scheme. Project will be under guidance of teachers and will begin from start of session.  
(viii) Periods required for library consultation/study may be arranged from architectural design periods at institute level.

GRAND TOTAL 2291  
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MAIN FEATURES OF THE CURRICULUM

TITLE OF THE COURSE : Diploma in Architectural Assistantship  
DURATION : Three Years (Six Semester)  
PATTERN OF THE COURSE : Semester System  
INTAKE : 60  
TYPE OF COURSE : Full Time  
MODE OF ADMISSION : Through Joint Entrance Examination  
ENTRY QUALIFICATION : Passed High School With 35% Marks

LIST OF EXPERTS

List of experts who contributed to the revision of the curriculum for The Three Year Diploma in Architectural Assistantship in Semester System on dated 21.4.15 at I.R.D.T., U.P., Kanpur

1. Sri I. J. Sachan HOD(Arch) G.G.P., Lucknow
2. Sri Arun Sachan Lecturer A.I.T.H., Kanpur
3. Sri Kapil Rao Prabuddha Lecturer G.P., Soro
4. Sri Manendra Kr. Kannaujia Lecturer G. P. Soro
5. Sri Amit Kumar Singh Lecturer G. P., Lucknow
6. Sri Uma Shanker Lecturer(Arch.)G.P., Hardoi
7. Km. Kalpana Devi Asstt. Prof. I.R.D.T., Kanpur

Workshop held at Govt. Girls Polytechnic, Lucknow on 11-12-15 . The experts whose deliberations helped in revision of this syllabus are honourably named below.

1. Sri Sanjeev Kr. Singh Principal G.P., Soron
2. Sri I. J. Sachan HOD(Arch) G.G.P., Lucknow
3. Sri Jitendra Kumar HOD(IDD) G.G.P., Lucknow
4. Sri Subodh Jalota HOD(IDD) G.G.P., Allahabad
5. Sri Amit Kr. Singh Lecturer(Arch) G.P., Lucknow
6. Sri Mohd. Tahseen Lecturer(Arch) G.P., Lucknow
7. Sri Saurabh Bhattacharya Lecture(Arch) G.P., Deoria
8. Sri Kuldeep Srivastava Lecturer(Arch) G.P., Deoria
9. Smt. Ruchi Singh Lecturer(Arch) G.P., Lucknow
10. Smt. Varsha Yadav Lectuer(Arch) G.G.P., Lucknow
11. Smt. Komal Yadav Lecturer(IDD) G.P., Soron
12. Smt. Ritu Gulati Asstt. Prof. A.K.T.U, Lucknow
13. Smt. Farheen Bano Asstt. Prof. A.K.T.U., Lucknow
14. Smt. Ravinder Kaur Interior Designer, Lucknow
15. Sri Dinesh Sharma Lecturer I.R.D.T., Kanpur
16. Kalpana Devi Asstt. Prof. I.R.D.T., Kanpur



Workshop held at I.R.D.T.U.P., Kanpur on 08-11-16 .  
The experts whose deliberations helped in revision of this  
syllabus are honourably named below.

- |    |                         |                  |                   |
|----|-------------------------|------------------|-------------------|
| 1. | Sri Indrajeet Sachan    | HOD (Arch.)      | G.G.P., Lucknow   |
| 2. | Sri Arun Sachan         | Lecturer(Arch.)  | A.I.T.H., Kanpur  |
| 3. | sri Gaurav Chandra      | Lecturer(Arch.)  | A.I.T.H., Kanpur  |
| 4. | Sri Uma Shanker         | Lecturer(Arch.)  | G.P., Hardoi      |
| 5. | Sri Kapil Rao Prabuddha | Lecturer (Arch.) | G.P., Soro        |
| 6. | Sri Umesh yadav         | Lecturer (IDD)   | G.P., Ghaziabad   |
| 7. | Sri Mukesh Singh        | Lecturer (IDD)   | G.G.P., Allahabad |
| 8. | Kalpana Devi            | Asstt. Prof.     | I.R.D.T., Kanpur  |

#### NEED ANALYSIS

Man is no more a nomad. He is now living in the well established societies. The problems of rice and roof keep on changing generation to generation. There has always been a downtrodden section of the society specially in the under developed and the developing countries. It needs shelter of its own apart from the quotidian needs of food and clothing. To provide them with a shelter of their own is a herculian task before any Government of such countries. The cost of building materials and labour involved are spiralling very fast. To meet the need, enormus funds are needed and also a big size of manpower at different levels. Apart from this, development of industries and trades, too need some or other kinds of buildings. To find an easy solution of these gigantic problems, some research is imperative to design buildings to suit the economy of the country and fulfill such needs as well. Rehabilitation work, in this way, needs a big team of Architects and Engineers to work for the Government and the private organisations.

Keeping all this in mind the Three Year Diploma Course In Architectural Assistantship has been designed to fulfill the need of the hour in terms of style, quality and economy of the day. The revision of the existing curriculum was imperative due to changing pattern of society and economy. To review the existing curriculum, two workshops at Lucknow have been organised. Experts from various professional organisations took keen interest in these gatherings. All that is wanted today has been identified and inserted properly. Now the curriculum at hand is fully concieved with all modern concepts relevant to the matter.

## PROFILE DEVELOPMENT

A tool in the form of a questionnaire was designed and sent to various organisations, industries, higher technological institutes and polytechnics for getting information about job opportunities, man power requirements and job activities of the diploma holders in Architectural Assistantship. Feed back taken from the experts through questionnaire, personal interviews and workshops was analysed and a draft structure of curriculum was prepared in a workshop held on 30th Oct. and 21st Nov.96 at Govt. Girls Polytechnic, Lucknow adopting the following procedures:

1. Listing job potential and job activities.
2. Analysing activities, knowledge and skills.
3. Deriving the course objectives.
4. Deriving subject areas from the course objectives.
5. Planning horizontal and vertical organisation of subjects.
6. Developing detailed course contents and coverage time.
7. Determining resource input in terms of human and information resources.

Review of this draft structure of the curriculum was done in a workshops held at the Govt. Girls Poly. Lucknow by a group of the experts from various fields , higher technological institutions and polytechnics.

It is hoped that this revised curriculum of Diploma in Architectural Assistantship will prove useful in producing the desired type of middle level trained man power for Architecture field.

### I. JOB OPPORTUNITIES FOR THE ARCHITECTURAL ASSISTANTS

In the profession of Architecture one has to work in two enterprises :

1. Private Sector Enterprises

2. Public Sector Enterprises

The private sector consists of firms of Architects or engineers whereas the Public Sector consists of:

- (a) State Department of Architecture
- (b) State Department of Town Planning
- (c) Urban Improvement Trust
- (d) State Housing Boards for Urban Development
- (e) Urban Improvement Trust
- (f) Indian Tourism Development Corporation
- (g) Post and Telegraph Department
- (h) All India Radio
- (i) Airport Authority of India
- (j) C.S.I.R.
- (k) Indian Railways
- (l) Rajkiya Nirman Nigam
- (m) Research, Design Standards Organisation, Lucknow
- (n) Harijan and Nirbal Verg Avas Nigam, Lucknow
- (o) Development Authorities

PATTERN OF EMPLOYMENT:

The following table gives a general pattern of employment in both Private and Public sector and it also indicates the minimum qualifications required for the posts.

LEVEL OF PROFESSION	PUBLIC/PRIVATE ENTERPRISES	GOVT. ENTERPRISE DEPARTMENT OF ARCHITECTURE/PWD /HOUSING BOARD, etc.	TOWN PLANNING Deptt. & URBAN IMPROVEMENT TRUST	MINIMUM QUALIFICATION
Technologist	1. Director of Firm 2. Senior Designer 3. Junior Designer 4. Assistant Designer	1. Chief Architect 2. Sr. Architect 3. Architect 4. Asstt. Architect	1. Chief Town Planner 2. Sr. Town Planner 3. Divisional Town Planner 4. Asstt. Town Planner	Degree in Architecture
Middle Level Diploma Technician Architectural Assistant	1. Architectural Assistant/Draftsman	1. Architectural Assistant 2. Sr. Architectural Draftsman 3. Jr. Architectural Draftsman	1. Planning Asstt. 2. Jr. Planning Asstt. 3. Asstt. Planning	In ship
Craftman  Draftsmanship	1. Tracer	1. Tracer	1. Tracer	ITI Certificate in

## II. JOB ACTIVITIES OF AN ARCHITECTURAL ASSISTANT:

The Architectural Assistant works in the office of the Architect in close association with the Architect or Town planner. He sometimes visits the sites for inspection. His activities both in the office and at the site are as follows:

### (A.) In The Office of an Architect:

- (i) From a Given line sketch, an Architectural Assistant develops a scaled preliminary drawing for presentation to the client, prepares perspectives, models of plywood, card boards and wood work.
- (ii) Once a sketch is approved, he prepares a municipal drawing in accordance with the local bye laws.
- (iii) He Prepares working drawings and construction drawings with special reference to joinery, panelling, finishing stair case details, false ceilings, architectural decorations and finishes, lighting, doors and windows, etc.
- (iv) He writes detailed specifications of all above items with special reference to size, materials and finishes.
- (v) He prepares rough estimates with reference to the above mentioned items on the basis of areas and volumes.
- (vi) He prepares estimates of small and simple building of say 100 sq. m. plinth area.
- (vii) He assists the architect in the preparation of tender document.
- (viii) Scrutinizes the building plans submitted to the department.

### (B) At the construction site :-

- (i) He undertakes measurement of a small plot of land for the preparation of a site plan and an existing building with specific reference to architectural working drawings, services, etc.
- (ii) He assists the architect in ensuring correct execution of the buildings with special reference to architectural working drawing.

III. ACTIVITY ANALYSIS (For Knowledge and Skills Required)

The activities which an Architectural Assistant is required to perform have been determined. The job of a polytechnic is to impart requisite knowledge (Concepts principles and problems) and skills to the student to enable him to do these tasks. Each task as detailed below has been taken out separately for specifying the knowledge and skills required for each. In performing exercises for each activity, there will be repetitions of certain important concepts and principles and skills, which should be, at a later stage, specifically noted. It helps the curriculum planner to determine the weightage to be given to the teaching of these aspects of training in the Curriculum.

Activity	Knowledge	Skills
*1.From a given line sketch, an architectural assistant develops a scaled preliminary drawing for presentation to the client, prepares perspectives, models of plywood, card-board & Wood.	<ol style="list-style-type: none"> <li>1.Fundamental principles of drafting</li> <li>2.Principles of landscaping and orientation of buildings</li> <li>3. Principles of perspective drawings with special reference to rendering and colouring.</li> <li>4.Principles of theory of design and design analysis (exterior and interior proposition, general layout, aesthetics, balance,orientation and climatology)</li> <li>5.Principles of practical geometry, surface development and intersection.</li> <li>6.Basic principles of Townplanning, zoning distance units, house densities, regional roads, arterial roads.</li> </ol>	<ol style="list-style-type: none"> <li>1.Skills in draftsmanship with accent on colouring and rendering</li> <li>2.Freehand sketching and perspective drawing and art drawing.</li> <li>3.Skill of model making block modelling, Card-board modelling, Cork modelling, Mounnt boards.</li> <li>4.Skill in calculating densities from plans.</li> </ol>
*2.Once a sketch is approved, he prepares a municipal drawing in accordance with local bye-laws.	<ol style="list-style-type: none"> <li>1.Knowledge of general bye-laws</li> <li>2.Specific bye-laws with relation to housing.</li> <li>3.General principles of town planning.</li> <li>4. Knowledge of Earthquake resistant features and use of IS code for masonry and KC buildings.</li> </ol>	<ol style="list-style-type: none"> <li>1.Skill in preparation of municipal drawing</li> </ol>

Activity	Knowledge	Skills
*3.Preparation of working and construction drawings with special reference to joinery, panelling, finishing, staircase detailing, false ceilings, architecture decorations and finishes, lighting, doors and windows.	<ol style="list-style-type: none"> <li>1.Principles of solid geometry, plain geometry, scaled drawing.</li> <li>2.Principles of building drawing.</li> <li>3.Basic concepts of structural design to arrive at fairly rough estimate of sizes of building elements.</li> <li>4.Principles of Building design layout of rooms and proportioning.</li> <li>5.Principles of building construction to understand the construction principles of building elements and building services.</li> <li>6.Concept of engineering seismology &amp; its application in building planning &amp; layout</li> </ol>	<ol style="list-style-type: none"> <li>1.Skill in preparing site plans and drainage layout, plans, roof plan, foundation plan, dimensioned plans for all floors, elevations and sections</li> <li>2.Skill in freehand lettering.</li> <li>3.Skill in preparing construction drawing positioning of water supply and drainage plans, duct, electrical services positioning of furniture</li> </ol> <p>Skill in preparing of earthquake resistant buildings</p>
He draws detailed drawings for all the items mentioned above.	<ol style="list-style-type: none"> <li>1.Principles of building construction and building services.</li> <li>2.Construction details of all building elements with emphasis on building details, materials and its standard specification</li> <li>3.Knowledge of building materials, such as bricks, cement and concrete, wood, timber, stone, paints, varnishes, floor finishes, tiles, plastics, pipes, bituminous products, damp proofing materials.</li> </ol>	<ol style="list-style-type: none"> <li>1.Skill in preparing full scale drawing for joinery (doors and windows), partitions built-in furniture, panelling, false ceiling. Special fittings, furniture details, staircase details, decoration, finishes, steel doors and windows.</li> </ol>
*4.Writes down detailed specifications.	<ol style="list-style-type: none"> <li>1.Elementary principles of building construction.</li> <li>2.Knowledge of material specifications.</li> <li>3.Principles of specifications writing.</li> </ol>	<ol style="list-style-type: none"> <li>1.Skill in specifications writing for various items on working drawings.</li> </ol>



Activity	Knowledge	Skills
5. Prepares rough estimate based on areas and volumes.	1. Basic principles of estimating. 2. Knowledge of basic techniques of building construction.	1. Skill in calculation areas and volumes of building & preparing rough estimates.
6. Prepares detailed estimates of a simple small house.	1. Principles of estimating. 2. Knowledge of basic principles of specification writing without involving details of RCC, Steel Structures. 3. Knowledge of basic techniques of building construction.	1. Skill in preparation of an estimate of a simple small house.
7. Assists the Architect in the preparation of tender documents.	1. Tendering procedures and requirements. 2. Architect's office procedures.	1. Skill in arranging and setting documents in order for a tender bill.
8. Scrutinizes the plans submitted to the department	1. Building Bye-laws. 2. Building drawing and detailing.	1. Skill in reading the drawings and pointing out shortcomings.
9. Field work.	1. Knowledge of principles of chain and tape survey, compass survey, plane tabling, levelling with dumpy level and contours, Theodolite.	1. Skill in plane table surveying of a small plot.
(i) Measurement of a small plot of land for the preparation of a site plan and an existing building, with specific reference to architectural working drawings, services, etc.	2. Knowledge of techniques involved in measurement of existing buildings.	2. Skill in plane table surveying of a small plot. 3. Skill in spot levelling. 4. Skill in contour surveying of a small land. 5. Skill in preparing measured drawing.
(ii) Assists architect in ensuring execution of buildings with special reference to architectural building	1. The same knowledge required as in preparation of construction and detailed drawing as in activity 3.	1. The same skill required as in preparation of construction and detailed drawing as in activity 3.

#### IV CURRICULUM OBJECTIVES

##### INTRODUCTION:

The preceding step outlines the knowledge and skills needed for Architectural Assistants to perform the activities mentioned therein. In this step, all knowledge and skills have been summarised. At this stage, it is important to determine the weightage for all knowledge and skills enumerated, for all objectives appear equally important. Weightage has been determined from two weightage points:

- (a) Importance of activities to which it subscribes. e.g. activities from serial number 1 to 4 are important and activities from serial number 5 to 7 are of auxiliary importance.
- (b) Number of time, knowledge and skills has been repeatedly mentioned in the previous step.

All objectives which deserve greater weightage are marked with asterisks (\*)

The Course objectives lay foundation for planning educational programmes.

##### CURRICULUM OBJECTIVES:

###### Knowledge:

- \* i. He must acquire basic concept of construction and drafting.
- \*ii. He must acquire basic concept and principles of theory of design exterior and interior proportioning, general layout, aesthetics, balance, orientation, climatology for presentation and municipal drawing.
- \*iii. He should equip himself with basic terms related to town planning to understand planning drawings.
- iv. He must equip himself with basic tools of practical geometry i.e. practical geometry, solid geometry, surface development, intersections, to be able to prepare presentation drawing, model making and working drawing.
- v. He must acquire basic principles of building construction, techniques of construction with various materials and of various elements of building construction and building services. He must acquaint himself with construction details of all building elements (but not building services) so as to enable him to prepare working drawing, and also to write down broad specifications on drawing.  
  
He must acquire adequate knowledge of mathematics to enable him to understand areas, volumes, trigonometry.
- vi. He must acquire fundamental concepts of structural behaviour and principles of structural design to the extent that he must be able to arrive roughly at the approximate sizes of building components.

- vii. He must possess knowledge of building bye-laws.
- viii. He must possess basic concepts of engineering materials used in buildings with special emphasis on bricks, cement, sand, concrete, wood, timber, stone, paints and varnishes, floor and wall finishes, tiles, plastics, pipes, bituminous products, damp proofing materials.
- ix. He must know basic principles in specification writings and understand the meaning of standard specifications of all building items and materials.
- x. He must acquaint himself with construction techniques involved in building construction, excavation for foundation stage to roof construction stage to enable him to grasp construction details and working drawings.
- xi. He must possess basic concept of ground motion, engineering, seismology, soil characteristics and its impact on various builtup forms during earthquake, Philosophy of earthquake resistant design of buildings, Behaviour of buildings during earthquake, Use of IS code for masonry and R C Buildings

Skills:

- \* i. He must acquire skills in drafting colouring and rendering. He must be skillful in free hand sketching, perspective drawing.
- \* ii. He must acquire skill in model making specially block modelling, card board and mount board modelling.
- \* iii. He must develop skills in preparing site plans, drainage layouts, roof plans, foundation plans, dimensioned plans, elevation, sections of building plans showing positioning of water supply and drainage plans. Symbolic representation of electrical services.
- \* iv. He must possess skills in preparing municipal drawings/submission/construction drawings.
- v. He must develop skills for preparing detailed/working drawings for individual items of buildings e.g. joinery, partition walls, built in furniture, false ceiling, special fittings, furniture details, staircase details, kitchen and toilet details, finishes, doors and windows.
- v. He must develop skill in preparing drawings of earthquake resistant masonry and R.C. Buildings
- vi. He must have skills in preparation of site plan by chain and tape survey or plane tabling and dumpy level.
- vii. He must have skills in preparing measured drawing, of monumental buildings to acquaint himself with details of materials and construction, decorative features.
- viii. He must acquire skills in choosing relevant specifications on drawing.
- ix. He must possess skills in preparing rough estimates from area and volume basis and also in preparing detailed estimates for small and simple houses.
- x. He must possess skill in taking out prints, folding of drawing.

V. CURRICULUM ANALYSIS FOR IDENTIFICATION OF SUBJECTS

Introduction:

Course objectives with weightage already determined, enable us to decide upon the curriculum areas required to achieve them. This step helps us to explain broadly why certain areas are included in the curriculum and thus help in specifying broadly the scope of each curriculum area.

COURSE OBJECTIVES	CURRICULUM AREAS SUGGESTED TO ACHIEVE THESE OBJECTIVES
a. Knowledge	
i. He must acquire basic concepts in construction drafting.	Architectural Design. Construction & Materials Building Services. Working Drawings.
ii. He must acquire basic concepts and principles of theory of design exterior and interior proportioning, general layout, aesthetics, balance, orientation, climatology, for presentation and municipal drawing.	Architectural Design History of Architectural Climatology  Building Bye-Laws
iii. He should equip himself with basic terms related to town planning to understand planning drawings.	Architectural Design Town Planning
iv. He must equip himself with basic tools of practical geometry i.e. practical geometry, solid geometry, surface development, intersections, to be able to prepare presentation drawing, model making and working drawing.	Graphic Presentation & Art Architectural Design
v. He should acquire basic principles of buildings construction, techniques of construction with various materials and of various elements of bldg. construction and bldg. services. He must acquaint himself with construction details of all bldg. elements (but not bldg. services) so as to enable to prepare working drawing, and also to write broad specifications on drawing.	Construction & Material. Building Services. Working Drawings. Estimating, Costing and Specifications.

COURSE OBJECTIVES	CURRICULUM AREAS SUGGESTED TO ACHIEVE THESE OBJECTIVES
vi. He must acquire adequate knowledge of mathematics to enable him to understand areas, volumes, trigonometry.	Applied Mathematics
vii. He must acquire fundamental concepts of structural behaviour and principles of structural design to that extent which he must be able to arrive roughly at the approximate size of building components.	Structures-A. Structures-B.
viii. He must possess knowledge of building bye laws.	Management, Accounts & Professional Practice
ix. He must possess basic concepts of engineering materials used in buildings with special emphasis on bricks, cement, sand, concrete, wood, timber, stone, paints and varnishes, floor and wall finishes, tiles, plastics, pipes, bituminous products, damp proffing materials.	Construction & Materials
x. He must know basic principles involved in specification writing and understand the meaning of standard specifications of all building items and materials.	Estimating, Costing & Specifications.
xi. He must possess the basic principles of building estimating to enable him to prepare an estimate of a small building and preparing rough estimate on area and volume basis.	Estimating, Costing & Specifications
xii. He must acquaint himself with construction technique involved in building construction from excavation of foundation stage to roof construction stage to enable him to grasp construction details and working drawings.	Construction & Materials. Architectural Design

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 COURSE OBJECTIVES  
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CURRICULUM AREAS SUGGESTED  
 TO ACHIEVE THESE OBJECTIVES  
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<p>xiii. He must possess basic concept of building orientation, building services to enable him to grasp the knowledge of providing water supply, sanitary and electrical services</p>	<p>Building Science          Architectural Design          Surveying</p>
<p>xiv. He must know basic principles of town planning, colonies layout to enable him to prepare layout plan, master plans</p>	<p>Town Planning          Architectural Design          Surveying</p>
<p>xv. He must acquire fundamental concepts of investigation, preparing topographical map, contour maps to enable him to prepare different types of maps of the areas.</p>	<p>Surveying</p>
<p>xvi. He must know the past developments which took place in the field of architecture to enable him to make future development plan in the construction of buildings.</p>	<p>History of Architecture-A          History of Architecture-B</p>
<p>xvii. He must be aware of the causes of Environmental Pollution and measures to control them to enable him to design the towns, colonies and buildings accordingly.</p>	<p>Environmental Pollution and Control          Town Planning</p>
<p>xviii. He must be aware of the computer developments to enable him to use the computers in the design of buildings</p>	<p>Introduction To Computers</p>
<p>ix. He must possess basic concept of ground motion, engineering, seismology, soil characteristics and its impact on various built-up forms during earthquake, Philosophy of earthquake resistant design of buildings, Behaviour of buildings during earthquake, Use of IS code for masonry and R C Buildings</p>	<p>Earthquake Engg. Concept</p>

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 COURSE OBJECTIVES

CURRICULUM AREAS SUGGESTED  
 TO ACHIEVE THESE OBJECTIVES  
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b. Skills

- |       |   |  |
|-------|---|--|
| i.    | He must acquire skills in drafting, colouring and rendering. He must be skillful in freehand sketching, perspective drawing.  | Graphic Presentation & Art   |
| ii.   | He must acquire skills in model making specially block modelling, card board and mount board modelling.   | Architectural Design<br>(Model Making)   |
| iii.  | He must develop skills in preparing site plans, drainage layouts, roof plans, foundations plans, dimensioned plans, elevation, sections of bldg. plans showing positioning of water supply and drainage plans, symbolic representation of electrical services.  | Architectural Design,<br>History of architecture,<br>Construction & Materials,<br>Building Science<br>(Climatology, P.H.E. &<br>Electrical Services) |
| iv.   | He must have skill in preparing municipal drawing / submission /corporation drawing.  | Architectural Design<br>Town Planning  |
| v.    | He must develop skills for preparing detailed working drawings for individual items of buildings e.g. joinery partition walls, built in furniture, false ceiling, special fittings, furniture details, kitchen and toilet details, finishes, doors and windows. | Construction & Materials<br>Building Services<br>Working Drawings  |
| vi.   | He must have a skills in preparation of site plan by chain and tape survey or plane tabling and dumpy level.  | Surveying  |
| vii.  | He must have skills in preparing measured drawing of monumental bldg. to acquaint himself with details of materials and construction, decorative features.  | Graphic Presentation & Art<br>History of Architecture  |
| viii. | He must acquire skills in choosing relevant specifications on drawing.  | Estimating, Costing &<br>Specifications<br>Construction & Materials  |
| ix.   | He must possess skills in preparing rough estimates from areas and volume basis and also  | Estimating, Costing &<br>Specifications  |

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COURSE OBJECTIVES

CURRICULUM AREAS SUGGESTED  
TO ACHIEVE THESE OBJECTIVES  
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- in preparing a detailed estimate for small and simple houses.
- x. He must possess skills in taking out prints, folding and drawings. Working drawings.
- xi. He must develop skills for establishing his own enterprize / professional practice Management, Accounts & Professional Practices. Town Planning
- xii. He must develop skill in preparing drawings of earthquake resistant masonry and R.C. Buildings Earthquake Engg. Concept



**1.1 FOUNDATIONAL COMMUNICATION  
SECTION "A" (ENGLISH)**

L    T    P  
4    -    -

**TOPIC WISE DISTRIBUTION OF PERIODS**

Sl.No.	Units	Coverage Time		
		L	T	P
<b>Section A English</b>				
1.	PARTS OF SPEECH	12	-	-
2.	VOCABULARY BUILDING	05	-	-
3.	Grammar	15	-	-
4.	DEVELOPMENT OF EXPRESSION (Composition)	12	-	-
<b>Section B Hindi</b>				
5.	Topic 5	2	-	-
6.	Topic 6	5	-	-
7.	Topic 7	5	-	-
		56	-	-

**DETAILED CONTENTS**

1. **PARTS OF SPEECH :**
  - a. Noun
  - b. The pronoun : Kinds and Usage
  - c. The adjective : Kinds and Degree
  - d. Determiner : Articles
  - e. The verb : Kinds
  - f. The Adverb : Kinds, Degree and Usage
  - g. Prepositions
  - h. Conjunctions
  - i. The Interjections
  - j. Subject: Verb Agreement (Concord)
  
2. **VOCABULARY BUILDING :**
  - a. Antonyms and Synonyms
  - b. Homophones
  - c. One word substitutions
  - d. Idioms and Phrases
  - e. Abbreviations
  
3. **Grammar**
  - a. Sentence & its types
  - a. Tenses
  - b. Punctuations
  - c. Active and Passive voice
  - d. Transformation of Sentences

- e. Synthesis of Sentences
- f. Direct and Indirect Narrations

4. **DEVELOPMENT OF EXPRESSION (Composition) :**

- a. Paragraph Writing
- b. Essay Writing
- c. Proposal Writing
- d. Letter Writing (Formal, Informal, Business, official etc.)
- f. Report Writing
- g. Note Making
- h. News Making
- i. Application Writing
- j. Minute Writing
- k. Invitation Letter Writing

**SECTION "B" (Hindi)**

- 5& I k] I o]ke] fo'ksk.k] fdz k fo'ksk.k] o.k] l ek] ] l f/k] vyzkj] j] ] mi l xz i R; ; A
- 6& i = ys[ku] fufonk l fonk] nj vke=k %dks/s ku½ vihy] LorU= vfHk; fDr] ifronu ys[ku] id foKfirA
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1.2 APPLIED MATHEMATICS I(A)  
[ Common to All Engineering Courses]

L T P  
3 2/2 -

Rationale:

The study of mathematics is an important requirement for the understanding and development of any branch of engineering. The purpose of teaching mathematics to diploma engineering students is to impart them basic knowledge of mathematics which is needed for full understanding and study of engineering subjects.

S.N.	Units	Coverage Time		
		L	T	P
1.	Algebra- I	8	3	-
2.	Algebra- II	8	3	-
3.	Trigonometry	6	2	-
4.	Differential Calculus-I	10	3	-
5.	Differential Calculus-II	10	3	-
		42	14	-

DETAILED CONTENTS:

1. ALGEBRA-I : (10 Marks)
  - 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:(10 Marks)
  - 2.1 Vector algebra : Dot and Cross product, Scaler and vector triple product.
  - 2.2 Complex number.
 

Complex numbers, Representation, Modulus and amplitud  
Demoivre theorem, its application in solving algebraic  
equations, Mod. function and its properties..
3. TRIGONOMETRY :(8 Marks)
  - 3.1 Relation between sides and angles of a triangle : Statement of various formulae showing relation ship between sides and angle of a triangle.
  - 3.2 Inverse circular functions : Simple case only

4. DIFFERENTIAL CALCULUS - I : (12 Marks)
  - 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, - Function of a function, Logarithmic differentiation, Differentiation of implicit functions.
5. DIFFERENTIAL CALCULUS -II :(10 Marks)
  - 5.1 Higher order derivatives, Leibnitz theorem.
  - 5.2 Special functions (Exponential, Logarithmic, Inverse circular and function), Definition, Graphs, range and Domain and Derivations of each of these functions.
  - 5.3 Application - Finding Tangents, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, velocity, Acceleration, Errors and approximation.

1.3 APPLIED PHYSICS-I

[ Common to All Engineering Courses]

L T P  
3 2/2 -

Rationale:

Engineering physics is a foundation Course. Its purpose is to develop proper understanding of physical phenomenon and scientific temper in the students. While teaching the subject, teachers should make maximum use of demonstrations to make the subject interesting to the students.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Units & Dimensions	3	1	-
2.	Errors in Measurement	3	1	-
3.	Circular Motion	4	1	-
4.	Motion of Planets	4	1	-
5.	Dynamics of rigid body (Rotational Motion)	5	1	-
6.	Fluid Mechanics and Friction	4	1	-
7.	Friction	4	1	-
8.	Harmonic Motion	5	2	-
9.	Heat & Thermodynamics	6	4	-
10.	Acoustics	4	1	-
		42	14	-

DETAILED CONTENTS:

1. Units and Dimensions (4 Marks)

S.I. Units & Dimensions of physical quantities, Dimensional formula and dimensional equation. Principle of homogeneity of dimensions and applications of homogeneity principle to:

- i) Checking the correctness of physical equations,
- ii) Deriving relations among various physical quantities,
- iii) Conversion of numerical values of physical quantities from one system of units into another. Limitations of dimensional analysis.

2. ERRORS AND MEASUREMENT (4 Marks)

Errors in measurements, accuracy and precision, random and systematic errors, estimation of probable errors in the results of measurement (Combination of errors in addition, subtraction, multiplication and powers). Significant figures, and order of accuracy in respect to instruments,

3. Circular Motion (5 Marks)

Central forces. Uniform Circular motion (Horizontal and Vertical cases), angular velocity, angular acceleration and centripetal acceleration. Relationship between linear and angular velocity and acceleration. Centripetal and centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge.

4. MOTION OF PLANETS AND SATELLITES :(5 Marks)

Gravitational force, Acceleration due to gravity and its variation w.r. to height and depth from earth, Kepler's Law, Escape and orbital velocity, Time period of satellite, Geo-stationary, Polar satellites (Concept Only)

5. Dynamics of Rigid Body (Rotational Motion) (6 Marks)

Rigid body, Rotational motion, Moment of inertia, Theorems (Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies (Lamina, Sphere, Disc, Cylinder), Concept of Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling of sphere on the slant plane. Concept of Fly wheel.

6. Fluid Mechanics :(5 Marks)

Surface tension, Capillary action and determination of surface tension from capillary rise method, Equation of continuity ( $A_1V_1=A_2V_2$ ), Bernoulli's theorem, and its application stream line and Turbulent flow, Reynold's number.

7. Friction :(4 Marks)

Introduction, Physical significance of friction, Advantage and disadvantage of friction and its role in every day life. Coefficients of static and dynamic friction and their measurements. viscosity, coeff. of viscosity, & its determination by stoke's method.

8. Harmonic Motion (6 Marks)

Periodic Motion, characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of its periodic time. Energy conservation in S.H.M.. Concept of phase, phase difference, Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

9. Heat & Thermodynamics: (6 Marks)

Modes of heat transfer (Conduction, Convection and Radiation), coefficient of thermal conductivity Isothermal and adiabatic process. Zeroth First, Second Law of Thermodynamics and Carnot cycle, Heat Engine (Concept Only).

10. Acoustics (5 Marks)  
Definition of pitch, loudness, quality and intensity of sound waves. Echo, reverberation and reverberation time. Sabine's formula without Derivation. Control of reverberation time (problems on reverberation time). Acoustics of building defects and remedy.

## 1.4 APPLIED CHEMISTRY

[ Common to All Engineering Courses]

L T P  
6 - -

Rationale:

Engineering Chemistry has profound and deep relationship with the industrial and environmental technology. This curriculum intends to impart technical knowledge alongwith productive practice to the students of the diploma engineering. The teachers are expected to guide the students in the classroom and the laboratories according to the curriculum by demonstrations and by showing relevant materials and equipments to inculcate interests in learning among students.

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Atomic Structure	4	-	-
2.	Chemical Bonding	6	-	-
3.	Classification of Elements	4	-	-
4.	Electro Chemistry-I	7	-	-
5.	Electro Chemistry-II	8	-	-
6.	Chemical Kinetics	4	-	-
7.	Catalysis	4	-	-
8.	Solid State	4	-	-
9.	Fuels	4	-	-
10.	Water Treatment	6	-	-
11.	Colloidal State	4	-	-
12.	Lubricants	4	-	-
13.	Hydrocarbons	7	-	-
14.	Organic Reactions & Mechanism	8	-	-
15.	Polymers	4	-	-
16.	Synthetic Materials	6	-	-
-----		84	-	-
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### DETAILED CONTENTS:

1. ATOMIC STRUCTURE :(3 MARKS)

Basic concept of atomic structure, Matter wave concept, Quantum number, Haisenberg's Uncertainty Principle, Shaples of orbitals.

2. CHEMICAL BONDING :(4 MARKS)

Covalent bond, Ionic & Co-ordinate, Hydrogen bonding, Valence bond theory, Hybridisation, VSEPR theory, Molecular orbital theory.

3. CLASSIFICATION OF ELEMENTS :(3 MARKS)



Modern classification of elements (s,p,d and f block elements), Periodic properties : Ionisation potential, electronegativity, Electron affinity.

4. ELECTRO CHEMISTRY-I:(3 MARKS)

Arrhenius Theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of Acid and bases : Bronsted, Arrhenius and Lewis theory. Concept of pH and numericals. Buffer solutions, Indicators, Solubility product, Common ion effect with their application,

5. ELECTRO CHEMISTRY-II:(3 MARKS)

Redox reactions, Electrode potential(Nernst Equation), Electro-chemical cell (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electro chemical series and its application. Chemical and Electrochemical theory of corrosion, Galvanic Series. Prevention of corrosion by various method.

6. CHEMICAL KINETICS :(3 MARKS)

Law of mass action, order and molecularity of reaction. Activation energy, rate constants, 1st order reactions and 2nd order reactions.

7. CATALYSIS :(2 MARKS)

Definition Characteristics of catalytic reactions, Catalytic promoters and poison , Autocatalysis and Negative catalysis, Theory of catalysis, Application.

8. SOLID STATE :(2 MARKS)

Types of solids (Amorphous and Crystalline), Classification (Molecular, Ionic, Covalent, Metallic), Band theory of solids (Conductors, Semiconductors and Insulators), types of Crystals, FCC, BCC, Crystal imperfection.

9. FUELS :(3 MARKS)

Definition, its classification, high & low Calorific value. Determination of calorific value of solid and liquid fuels by Bomb calorimeter.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Diesel and Petrol), Benzol and Power alcohol. Knocking, Anti-knocking agents, Octane number and Cetane number.

Cracking and its type, Gasolining from hydrogenation of coal (Bergius process and Fischer tropesch's process)

Gaseous Fuel - Coal gas, Oil gas, Water gas, Producer gas, Bio gas, LPG and CNG.

Numerical Problems based on topics

10. WATER TREATMENT :(3 MARKS)

Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sods lime, Zeolote and Ion exchange resin process). Disadvantage of hard water in different industries, scale and sludge formation, Corrosion, Caustic embrittlement, primming and foarming in biolers.

Disinfecting of Water By Chloramine-T, Ozone and Chlorine. Advantage and disadvantage of chlorinational, Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Numerical Problems based on topics.

11. COLLOIDAL STATE OF MATTER :(3 MARKS)

Concept of collidal and its types, Different system of colloids, Dispersed phase and dispersion medium. Methods of preparation of colloidal solutions, Dialysis and electrodialysis. Properties of colloidal solution with special reference to absorption, Brownian Movement, tyndal effect, Electro phoresis and coagulation. relative stability of hydrophillic and hydrophobie colloids. Protection and protective colloids. Emulsion, Types, preparation,properties and uses. Application of colloids chemistry in different industries.

12. LUBRICANTS :(3 MARKS)

Definition, classification, Necessasity and various kinds of lubricants. Function and mechanism of action of lubricants and examples. Properties of lubricants, Importance of additive compunds in lubricants, Synthetic lubricants and cutting fluids. Industrial application, its function in bearing.

13. HYDROCARBONS:(4 MARKS)

A. Classification and IUPAC nomeuclature of organic compounds hamologous series (Functional Group)

B. Preparation, properties and uses of Ethane, Ethene, Ethyne

(Acetylene), Benzene and Toluene.

14. ORGANIC REACTIONS & MECHANISM:(4 MARKS)

1. Fundamental aspects -

- A. Electrophiles and nucleophiles, Reaction Intermediates, Free radical, Carbocation, Carbanion
- B. Inductive effect, Mesomeric effect, Electromeric effect.

2.A. Mechanism of addition reaction (Markonikov's Rule, Cyanohydrin and Peroxide effect),

B. Mechanism of Substitution reactions; (Nucleophilic) hydrolysis of alkyl halide, electrophilic substitution halogenation, Sulphonation, Nitration and Friedel-Craft reaction.

C. Mechanism of Elimination reaction - Dehydration of primary alcohol, Dehydrohalogenation of primary alkyl halide.

15. POLYMERS :(3 MARKS)

1. Polymers and their classification. Average degree of polymerisation, Average molecular weight, Free radical polymerisation (Mechanisms)

2. Thermosetting and Thermoplastic resins -

- A. Addition polymers and their industrial application- Polystyrene, PVA, PVC, PAN, PMMA, Buna-S, Buna-N, Teflon.

- B. Condensation polymer and their industrial application : Nylon 6, Nylon 6,6, Bakelite, Melamine formaldehyde, Urea formaldehyde, Terylene or Decron, Polyurethanes.

3. General concept of Bio polymers, Biodegradable polymers and inorganic polymers(Silicon)

16. SYNTHETIC MATERIALS :(4 MARKS)

- A. Introduction - Fats and Oils
- B. Saponification of fats and oils , Manufacturing of soap.
- C. Synthetic detergents, types of detergents and its manufacturing.

3. EXPLOSIVES: TNT, RDX, Dynamite.

4. Paint and Varnish

## 1.5 GRAPHIC PRESENTATION AND ART

L T P  
4 - 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 personnel working in different capacities acquire appropriate skills in the use of this graphic language. The paper aims at fulfilling the need.

### TOPIC WISE DISTRIBUTION OF PERIODS

SL.No.	Topic	L	T	P
1.	Lettering & Scales	4	-	14
2.	Graphic Presentation	12	-	24
3.	Development of Surfaces	6	-	10
4.	Isometric Projections	6	-	10
5.	Architectural Drawing	8	-	16
6.	Rendering	8	-	16
7.	Art	12	-	22
		56	-	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 furnitures 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 sketch which is supplied to be rendered 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 area and finishes in colours or colour tints.
- (c) Stippling in ink to create effects of 3 dimensions and shadows etc.

(Geometrical forms which is to be involved are 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, Anthropomorphic, etc.

MODEL EXERCISES OF ART :

Should be given on -

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

1.6 INTRODUCTION TO COMPUTER

[Common with Civil Engg., Civil (Spl. With Rural), Mechanical Engg., (Specialisation in Production, Automobile, Refrigeration and Air conditioning), Electronics Engg., Instrumentation and Control Engg., Dairy Engg., Leather Technology, Footwear and Leather Goods Tech., Ceramics, Chemical Engg. (Four year Sandwich), Chemical Tech. (Rubber & Plastic), Chemical Tech. (Fertilizer) ]

L T P  
2 - 5

Rationale:

Computers are being used for design and information processing in all branches of engineering. An exposure to fundamentals of computer programming is very essential for all diploma holders. This subject has been included to introduce students in the use and application of computers in engineering.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction to Computer	4	-	-
2.	Introduction To Operating System (MS DOS/Windows)	3	-	-
3.	Word Processing	4	-	-
4.	Worksheet	4	-	-
5.	Presentation	4	-	-
6.	Data Base Operation	3	-	-
7.	Introduction to Internet	2	-	-
8.	Introduction to advance tools	4	-	-
		28	-	70

DETAILED CONTENTS

1. Introduction to Computer:
  - A. Block Diagram of Computer.
  - B. Types Of Computer
  - C. Types of Input and Output devices
  - D. Memories Devices (Its Types and Basic).
2. INTRODUCTION TO OPERATING SYSTEMS (MS-DOS/MS-WINDOWS:)
 

What is operating system, its significance, Commands of DOS, Features/Application of window.
3. WORD PROCESSING:
 

File : Open, Close, Save, Save as, Search, Send to, Print Preview, Print and Page Setup

Edit : Cut, Copy, Paste, Office Clipboard, Select All, Find, replace, Goto, etc.

View : Normal/Web Layout/Print Layout; Tool Bars;  
Header/Footer; Zoom, etc.  
Insert: Break, Page Number, Date & Time, Symbol, Comment,  
Reference, etc.  
Format: Font, Paragraph, Bullets & Numbering, Borders &  
Shading, Column, Change case, Back ground, etc.  
Tools : Spelling & Grammer, Language, Word Count, Letters &  
Mailing, Options, Customize, etc.  
Table : Draw, Insert, Delete, Select, Auto Format, AutoFit,  
Convert, Sort, Formula, etc.  
Mail Merge

4. WORKSHEET:

Introduction, Use of Tools/Icons for preparing simple  
Mini Project.

5. PRESENTATION :

Introduction, Use of Tools/Icons for preparing simple  
presentation on Power Point.

6. DATABASE OPERATION :

Create database using MS Access, Create Table and Creating  
Reports.

7. Introduction to Internet:

What is Network, How to send & receive messages, Use of  
Search Engines, Surfing different web sites. Creating Mail  
ID, Use of Briefcase, Sending./replying emails.

8. INTRODUCTION TO ADVANCE TOOLS :

I. Steps requires to solving problems.  
A. Flow Chart  
B. Algroithm  
C. Programming

II. Use of advance Tools such as Skype, Teamviewer, Installation  
of Modem, use of WiFi, Etc.

## INTRODUCTION TO COMPUTER LAB

### List Of Practical's

1. Practice on utility commands in DOS.
2. Composing, Correcting, Formatting and Article (Letter/Essay/Report) on Word Processing tool Word and taking its print out.
3. Creating, editing, modifying tables in Database tool.
4. Creating labels, report, generation of simple forms in Database tool.
5. Creating simple spread sheet, using in built functions in Worksheet tool..
6. Creating simple presentation.
7. Creating mail ID, Checking mail box, sending/replying e-mails.
8. Surfing web sites, using search engines.

Note : In the final year, related students have to use the concept of MS Word/MS Excel/MS Access/ MS Power Point in their respective branch's project work such as creating project report through MS Word/Creation of statistical data in MS Excel/Creation of database in MS Excel/Demonstration of project through Power Point Presentation.



## Rationale:

The study of mathematics is an important requirement for the understanding and development of any branch of engineering. The purpose of teaching mathematics to diploma engineering students is to impart them basic knowledge of mathematics which is needed for full understanding and study of engineering subjects.

S.N.	Units	Coverage Time		
		L	T	P
1.	Integral Calculus-I	12	4	-
2.	Integral Calculus-II	12	4	-
3.	Coordinate Geometry (2 Dimensional)	10	3	-
4.	Coordinate Geometry (3 Dimensional)	8	3	-
		42	14	-

## DETAILED CONTENTS:

1. INTEGRAL CALCULUS - I : (14 Marks)
  - 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.
2. INTEGRAL CALCULUS -II :(14 Marks)
  - 2.1 Meaning and properties of definite integrals, Evaluation of definite integrals. Integration of special function.
  - 2.2 Application : Finding areas bounded by simple curves, Length of 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.
3. CO-ORDINATE GEOMETRY (2 DIMENSION):(14 Marks)
  - 3.1 CIRCLE :

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

3.2 Standard form and simple properties

Parabola  $x^2=4ay$ ,  $y^2=4ax$ ,

Ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

Hyperbola  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

4. CO-ORDINATE GEOMETRY (3 DIMENSION):(8 Marks)

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 and Plane ( Different Forms),

4.2 Sphere  $x^2 + y^2 + z^2 + 2gx + 2fy + 2wz=d$  (Radius, Centre and General Equation)

2.2 APPLIED PHYSICS-II

[ Common to All Engineering Courses]

L T P  
3 2/2 4

Rationale:

Engineering physics is a foundation Course. Its purpose is to develop proper understanding of physical phenomenon and scientific temper in the students. While teaching the subject, teachers should make maximum use of demonstrations to make the subject interesting to the students.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Optics	4	1	-
2.	Introduction To Fiber Optics	4	1	-
3.	Laser & its Application	4	1	-
4.	Electrostatics	4	1	-
5.	D.C. Circuits	4	1	-
6.	Magnetic Materials & Their Properties	4	1	-
7.	Semi Conductor Physics	4	1	-
8.	Introduction Diode & Transistors	4	2	-
9.	Introduction To Digital Electronics	4	2	-
10.	Non-conventional energy sources	6	3	-
		42	14	56

1. Optics (4 Marks)

Nature of light, Laws of Reflection and Refraction, Snell's Law, Interference (Constructive and Destructive), Diffraction and Polarization (Concept Only), Law of Malus and Polaroids.

2. Introduction To Fibre Optics :(5 Marks)

Critical angle, Total internal reflection, Principle of fibre optics, Optical fibre, Pulse dispersion in step-index fibres, Graded index fibre, Single mode fibre, Optical sensor.

3. Lasers and its Applications (4 Marks)

Absorption and Emission of energy by atom, Spontaneous and Stimulated Emission, Population inversion, Main component of laser and types of laser- Ruby Laser, He-Ne laser and their applications. Introduction to MASER.

4. Electrostatics :(4 Marks)

Coulomb's Law, Electric field, Electric potential, Potential energy, Capacitor, Energy of a charged capacitor, Effect of

dielectric on capacitors.

5. D.C. Circuits (5 Marks)

Ohm's Law, Kirchoff's Law and their simple application, Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); Carey Foster's bridge, potentiometer.

6. Magnetic Materials and Their Properties: (5 Marks)

Dia, Para and Ferro-magnetism, Ferrites, Magnatic Hysteresis Curve and its utility. Basic idea of super conductivity, Meissner's effect.

7. Semiconductor Physics (4 Marks)

Concept of Energy bands in soldis, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semi conductors, Electrons and holes as charge carriers in semiconductors, P-type and N-type semiconductors.

8. Junction Diode and Transister : (6 Marks)

Majority and Minority charge carriers, P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics, Formation of transistor, transistor-action, Base, emitter and collector currents and their relationship LED's.

9. Introduction To Digital Electronics : (6 Marks)

Concept of binary numbers, Interconversion from binary to decimal and decimal to binary. Concepts of Gates (AND, NOT, OR).

10. Non-conventional energy sources: (7 Marks)

- (a) Wind energy : Introduction, scope and significance, measurement of wind velocity by anemometer, general principle of wind mill.
- (b) Solar energy: Solar radiation and potentiality of solar radiation in India, uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector.

PHYSICS LAB

Note: Any 4 experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.
2. Determination of 'g' by plotting a graph  $T^2$  versus  $l$  and using the formula  $g = 4\pi^2 / \text{Slope of the graph line}$
3. Determine the force constant of combination of springs in case of 1. Series 2. Parallel.
4. To verify the series and parallel combination of Resistances with the help of meter bridge.
5. To determine the velocity of sound with the help of resonance tube.
6. Determination of viscosity coefficient of a lubricant by Stoke's law.
7. Determination of  $E_1/E_2$  of cells by potentiometer.
8. Determination of specific resistance by Carey Foster bridge.
9. Determination of resistivity by P.O.Box.
10. Verification of Kirchoff's Law.
11. To draw Characteristics of p-n Junction diode.
12. To measure instantaneous and average wind velocity by indicating cup type anemometer/hand held anemometer.

NOTE :

Students should be asked to plot a graph in experiments (where possible) and graph should be used for calculation of results. Results should be given in significant figures only.

### 2.3 APPLIED MECHANICS

[ Common to three years Diploma Course in Civil Engg., Agriculture, Dairy, Ceramic, Civil & Rural Engg., Chemical Engineering, Architecture Assistantship, Computer Science & Engineering]

[ Also Common to Mechanical Engineering (Spacialization In Production Engineering )

[ Also common to First year Diploma Course in Chemical Technology : (1) Fertilizer Technology, (2) Rubber and Plastic Technology ]

L T P  
5 1 2

#### RATIONALE

The subject Applied Mechanics deals with fundamental concepts of mechanics which are useful for the students for further understanding of the second & final year subjects like S.O.M. and theory and design of steel & masonry structures as well as RCC designs. The subject enhances the method ability of the students.

#### TOPIC WISE DISTRIBUTION OF PERIODS

SL.No.	Topic	L	T	P
1.	Introduction	4	1	
2.	System of Forces & General Condition of Equilibrium	12	3	
3.	Moment and Couple	9	1	
4.	Friction	9	1	
5.	Machines	9	2	
6.	Center of Gravity	9	2	
7.	Moment of Inertia	9	2	
8.	Beam & Trusses	9	2	
Total		70	14	28

#### DETAILED CONTENTS

##### 1. Introduction:

Mechanics and its utility. Concept of scalar and vector quantities. Effect of a force. Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force.

##### 2.A. System of Forces :

Concept of coplaner and non-coplaner forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering

problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a particle, conditions of equilibrium of coplaner concurrent force system.

B. General Condition of Equilibrium:

General condition of equilibrium of a rigid body under the action of coplaner forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body.

3. Moment & couple:

Concept of Varignon's theorem. Generalised theorem of moments. Application to simple problems on levers-Bell crank lever, compound lever, steel yard, beams and wheels, lever safety valve, wireless mast, moment of a couple; Properties of a couple ; Simple applied problems such as pulley and shaft.

4. Friction:

Types of friction:statical,limiting and dynamical friction, statement of laws of sliding friction, Coefficient of friction, angle of friction; problems on equilibrium of a body resting on a rough inclined plane, simple problems on friction. Conditions of sliding and toppling.

5. Machines:

Definition of a machine. Mechanical advantage, velocity ratio, input, output, mechanical efficiency and relation between them for ideal and actual machines. Law of a machine Lifting machines such as levers, single pulley, three system of pulleys. Weston differential pulley, simple wheel and axle, differential wheel and axle. Simple screw jack, differential screw jack, simple worm and worm wheel.

6. Centre of Gravity:

Concept, definition of centroid of plain figures and center of gravity of symmetrical solid bodies. Determination of centroid of plain and composite lamina using moment method only, Centroid of bodies with removed portion. Determination of center of 'gravity' of solid bodies - cone, cylinder, hemisphere and sphere, composite bodies and bodies with portion removed.

7. Moment of Inertia:

Concept of moment of inertia and second moment of area and radius of gyration, theorems of parallel and perpendicular axis, second moment of area of common geometrical section : rectangle, triangle, circle (without derivations). Second moment of area for L, T, I and channel section, section of modulus.

8. Beams & Trusses:

Definition of statically determinate and indeterminate trusses. Types of supports. Concept of tie & strut, Bow's notation, space diagram, polar diagram, funicular polygon; calculation of reaction at the support of cantilever and simply supported beams and trusses graphically and analytically; graphical solution of simple determinate trusses with reference to force diagram for determining the magnitude and nature of forces in its various members. Analytical methods: method of joints and method of sections.(simple problems only)

Applied Mechanics Lab : Practicals

1. To verify the law of Polygon of forces.
2. To verify the law of parallelogram and triangle of forces.
3. To verify the law of principle of moments.
4. To find the coefficient of friction between wood, steel, copper and glass.
5. To find the reaction at supports of a simply supported beam carrying point loads only.
6. To find the forces in the jib & tie of a jib crane
7. To find the forces in the members of a loaded roof truss.  
(King / Queen post truss)
8. To find the mechanical advantage, velocity ratio and efficiency of any three of the following machines:
  - (i) Simple wheel & axle
  - (ii) Differential wheel & axle
  - (iii) Differential pulley block



(iv) Simple Screw jack

(v) Simple Worm & worm wheel

(vi) System of Pulleys (any type).

9. To find out center of gravity of regular lamina.

10. To find out center of gravity of irregular lamina.

## 2.4 ARCHITECTURAL DESIGN-A

(Basic Design)

L T P  
2 - 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 paper will fulfill the need.

### TOPIC WISE DISTRIBUTION OF PERIODS

SL.No.	Topic	L	T	P
1.	Basic Design	4	-	-
2.	Introduction To Architectural Design			
	A. Theory	8	-	-
	B. Design	8	-	-
	C. Model	8	-	-
		28	-	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 C.O.A., I.I.A., NASA.

##### UNDERSTANDING OF FUNDAMENTALS (SPACE AND ARCHITECTURE):

Understanding of General Design Principles 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 sample 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 hostel room etc (Basic activities only).

STRUCTURES SYSTEMS :

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

B. DESIGN :

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 be got prepared from the students for which the tools and materials etc. will be supplied from the institutions.

NOTE :

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 work sites to clarify the concepts and principles.

APPROACH :

Drawing and model making skill will be taught along with the

subject to improve the abilities to understand space and form.

## 2.5 CONSTRUCTION & MATERIALS-A

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

L T P  
3 - 3

### 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		42

### DETAILED CONTENTS

#### 1. ELEMENTARY 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 Panelled doors and Flush doors. Details of hardwares 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.

Practicals

1. Identification of different types of building material.
2. Different types of bonds in brick masonry.

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

## 2.6 ELEMENTARY WORKSHOP PRACTICE

L   T   P  
-   -   12

### Rationale

A diploma holder in any branch of engineering has to work in between a skilled workman and an Engineer. In order to have effective control over the skilled workmen it is necessary that the supervisory staff must have adequate knowledge and skill. For development of skills, workshop practice is very essential.

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Carpentry shop	-	-	45
2.	Painting & polishing shop	-	-	45
3.	Sheet metal	-	-	39
4.	Plumbing shop	-	-	39
		-	-	168

### DETAILED CONTENTS

1.           Carpentry Shop Work:
  - EX-1   Planing and sawing practice
  - EX-2   Making of lap joint
  - EX-3   Making of mortise and tenon joint
  - Ex-4   Making of bridle joint
  - EX-5   Making of dovetail joint
  - Ex-6   Making of any one utility article such as wooden-picture frame, hanger, peg, name plate, etc.
  
2.           Painting and Polishing:
  - EX-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.
  - Ex-2   To prepare metal surface for painting, apply primer and paint the same.
  - EX-3   To prepare a metal surface for spray painting, first spray primer and paint the same by spray painting gun and compressor system.
  - \* EX-4   Buffing and abressive polishing of brass job.
  - Ex-5   Zinc coating by electroplating method.
  - Ex-6   To prepare any utility job.
  
- \*   The sequence of polishing will be as bellow:
  - 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. Sheet Metal :

- EX-1 Cutting, shearing and bending of sheet.
- EX-2 To prepare a soap case by the metal sheet.
- EX-3 To make a funnel with thin sheet and to solder the seam of the same.
- EX-4 Preparation of different type of joints such as Lap joint-single seam, double seam. Hemp and wired joints.
- EX-5 Study and sketch of various types of stakes/anvil.

4. Plumbing Work :

- EX-1 Cutting and threading practice for using socket, elbow and tee etc. and to fit it on wooden practice board.
- EX-2 Study of-bib cock, cistern or stop cock, wheel valve and gate valve etc.



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

## RATIONALE

L	T	P
5	2	-

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 the paper. The paper aims at fulfilling the need.

## TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Climatology	10	6	-
2.	Public Health Engineering			
	A. Water Supply	18	6	-
	B. Sewerage & Drainage	24	10	-
3.	Electrical Services/Mechanical Services	18	6	-
		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.

## 2. PUBLIC HEALTH ENGINEERING:

## (a) Water Supply:

Sources of water supply impurities of Domestic water, Domestic water supply, Water piping system, Various methods of water treatment, Testing of water, Average consumption of water for various activities based on Calculation of total water consumption.

## (b) Sewerage &amp; Drainage:

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 pipe materials.

3. ELECTRICAL/MECHANICAL SERVICES:

Electrical Services :

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.

Acoustics :

Introduction of acoustics : basic terms used in acoustics and reverberation time.

HVAC Services :

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.

Mechanical Services :

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 :

Fire detection equipments - Heat and smoke sensors, Fire alarms System.

Fire fighting 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.

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, Septictank, Traps etc.

B. Introduction to lift/escalator, fire fighting system, HVAC  
(Fundamental only) with introduction to acoustics.

NOTE:

A Material lab cum Museum must be made available for  
effective and functional teaching.

### 3.2 HISTORY OF ARCHITECTURE-A

#### RATIONALE

L	T	P
3	2	-

The past work is always a foundation for progress. The knowledge of past achievements in any field is helpful for improvement and renovation. So is the paper here to give 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.

##### 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.

#### NOTE:

History of Architecture is to be taught with a view to understanding how different Architectural solutions were evolved (In successive historical periods) within the restraints imposed by prevalent social and religious customs, available building materials, complex structural problems and the limited technology available at the time.

### 3.3 SURVEYING

#### RATIONALE

L T P  
6 - 14

One of the main concern which is required to be carried out for the development of township, residential colonies, public buildings, etc. is the survey work. The technician architecture is supposed to have thorough knowledge of different methods of surveying and levelling, plotting of the survey work done and also setting out works for excavation. The technicians have to be skilled in the use of survey instruments by doing exercise. The paper aims at fulfilling the need.

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Chain Survey	15	-	-
2.	Areas	9	-	-
3.	Compass Surveying	9	-	-
4.	Levelling	15	-	-
5.	Theodolite	12	-	-
6.	Plane Table Surveying	12	-	-
7.	Total Station	12	-	-
		84	-	196

#### DETAILED CONTENTS

##### 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 levelling, Entering the readings in level book, Computing of RL by "Line of collimation" method, "Rise & Fall" method. Curvature and Refraction, Reciprocal Levelling, 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, levelling 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 findings 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 atleast four change points. Plate 1
- Ex.(xi) Setting a gradeint 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

- Trail 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



### 3.4 CONSTRUCTION AND MATERIALS-B

(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.

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Materials	12	-	-
2.	Doors & Windows	8	-	-
3.	Staircases	10	-	-
4.	Damp Proofing	4	-	-
5.	Floors & Cavity Walls	8	-	-
		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, Fibre Board, Block Board and Ply Board laminates), Plastics, Corks, Rubber, Aluminium, 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:

Glossary of terms used in stairs, Planning and layout of staircase, Different types of Staircases in R.C.C., steel and Timber.

4. DAMP PROOFING:

Vertical D.P.C. and Damp proofing of Basements, Roof 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.

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.

3.5 COMPUTER AIDED DESIGN

L T P  
- - 8

Rationale :

To expose the students to CAD related software( e.g. AUTOCAD) and other computer softwares related to architectural design to enable them to work in different computer environments and to enable the student to plan and make schemes on 2-D and 3-D drawings for architectural projects using latest software such as Photo Shop, 3-D Max, AUTO CAD, Revit & Sketch up and other open source software as per requirement.

TOPIC WISE DISTRIBUTION OF PERIODS

Sr.No.	Topics	Coverage Time		
		L	T	P
1.	Topics-1			
2.	Topics-2			
3.	Topics-3			
4.	Topics-4			
5.	Topics-5			
6.	Topics-6			
Total		-		112

1. INTRODUCTION TO AUTOCAD:

Basic Autocad commands line, fill, solids, arc, zoom, etc. use of layers, Dimensioning, Text writing, Use of W-block command and readymade symbols, Fixing of drawing sheet-size, Use of units, Scaling in AUTOCAD.

2. Methods of preparation of simple architectural drawings and sketches.

- 2.1 Preparation of any one layout plan, including furniture.
- 2.2 Preparation of sections and elevations.
- 2.3 Preparation of electrical plans.

3. Preparation of drawings of any one architectural design project work done by the students.

- 3.1 Drawing of Plan.
- 3.2 Drawings of Elevation.
- 3.3 Drawing of Section.
- 3.4 Drawing of Views.

- 4. Brief introduction to 3-D drawings commands
- 5. Printing and Plotting
- 6. Plotting of drawing of any design project with estimate.

NOTE :

Student should be exposed to different computer software in the area of architectural design being used at commercial level in the market through visits and demonstration.

## 4.1 Functional Communication

L	T	P
4	-	-

## TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
<b>Section A English</b>				
1.	On Communication	04	-	-
2.	Exploring Space	04	-	-
3.	Sir C.V. Raman	04	-	-
4.	Professional Development	04	-	-
5.	Buying a Second Hand Bicycle	04	-	-
6.	Leadership and Supervision	04	-	-
7.	First Aid	03	-	-
8.	The Romanance of Reading	03	-	-
9.	No Escape from Computers	03	-	-
10.	Bureau of Indian Standards	03	-	-
<b>Section B Hindi</b>				
1.	Topic 1	02	-	-
2.	Topic 2	02	-	-
3.	Topic 3	02	-	-
4.	Topic 4	02	-	-
5.	Topic 5	02	-	-
6.	Topic 6	02	-	-
7.	Topic 7	02	-	-
8.	Topic 8	01	-	-
9.	Topic 9	02	-	-
10.	Topic 10	02	-	-
11.	Topic 11	01	-	-
		56	-	-

## Section "A" (English)

## Text Lessons

Unit I.	On Communication
Unit.II	Exploring Space
Unit.III	Sir C.V. Raman
Unit.IV	Professional Development of Technicians
Unit.V	Buying a Second Hand Bicycle
Unit.VI	Leadership and Supervision
Unit.VII	First Aid
Unit.VIII	The Romanance of Reading
Unit.IX	No Escape from Computers
Unit.X	Bureau of Indian Standards

## Section "B" Hindi

1&	Lojkst xkj
2&	Hkkj rh; oKkfudka , oa rdutfd; ka dk Hkkj r ds fodkl ea ; kxnku

3& xkE; fodkl  
4& ifjokj fu; kstu  
5& lkekftd l l Fkk; a  
6& fu; kstu vkj tu dY; k.k  
7& Hkkjr ea i kSj ffxdh ds fodkl dk bfrgkl  
8& gfjr dkkUr  
9& i; kbj.k , oa ekuo i nllk.k  
10& Jfed dY; k.k  
11& Hkkjr ea Jfed vkUnksyu

## 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.

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Introduction	22	13	-
2.	City Planning	22	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 - Mohanjodoro and Harapa, Taxila and Nalanda.

#### 2. CITY PLANNING:

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

#### 4.3 STRUCTURE-A

##### RATIONALE

L T P  
5 2 -

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 a material, under the action of external forces. The student will learn to analyse simple structural elements for their design, which he usually needs in his 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.

##### 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	15	6	-
	A. Riveted Joints			
	B. Welded Joints			
		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 contraflexure, 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 rectangular, I, T and L section. Comparison of strength of



the above sections. Concept of shear stresses in beams, Shear stress distribution in rectangular, I and T section .

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 Euler'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

#### 4.4 ESTIMATING, COSTING & SPECIFICATIONS

L T P  
4 3 -

##### 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 practicals to the extent possible.

##### TOPIC WISE DISTRIBUTION OF PERIODS

Sr.No.	Topics	L	T	P
1.	Introduction	4	2	-
2.	Units	4	2	-
3.	Methods of Taking Out Quantities	4	4	-
4.	Detailed Estimate	8	6	-
5.	Analysis of Rates	8	6	-
6.	Specifications	8	6	-
7.	P. H. E. Items	8	6	-
8.	Valuation	12	10	-
		56	42	-

##### 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.

###### 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 to bed 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 of UPPWD. Preparation of summary 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.
- (b) Earth work in filling.
- (c) Lime and 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. and R.B. roof slabs.
- (i) R.C.C. and R.B. work in beams, lintels and sunshade.
- (j) Wood work in chauthats/frames of doors and windows.
- (k) Wood work in shutters of doors and windows.
- (l) White washing, colour washing, distempering, water proof cement paint on walls and ceiling.
- (m) Painting 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. items

- i. Preparation of detailed estimate for laying a water supply line (C. I. pipe).

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

8. VALUATION:

Purpose of valuation, Principles of valuation, Definitions of terms such as depreciation, 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.

#### 4.5 ARCHITECTURAL DESIGN -B

##### RATIONALE

L T P  
4 - 16

The basic elements and concepts of architectural design have been dealt within length in previous year. Now, the application of the syllabus in designing of certain category of buildings such as resturants, clinics, schools,etc. is to be dealt within this paper.  
evelopment of out door areas.

##### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Studio	12	-	-
2.	Prespective & Sciography	10	-	-
3.	Interior Schemes	10	-	-
4.	Models	12	-	-
5.	Computer Graphics	12	-	-
		56	-	224

##### DETAILED CONTENTS

###### I. STUDIO:

Studio workshop which include simple and small design problems involving horizontal/vertical circulation like small residences, clinics, nursery and primary schools, restaurants, branch post offices etc. Development of outdoor areas (work of student must be reflect the understanding of fundamentals as described in syllabus of Architectural Design "A" (Basic Design).

###### II. PERSPECTIVE & SCIOGRAPHY:

Prespective, Sciography and Rendering be added so that the students may submit rendered drawings, and prespective drawing be prepared for atleast 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 be got prepared from the students for which the materials etc. shall be supplied from

the institution.

V COMPUTER GRAPHICS

Complete 2D Drawing Solution Though AUTO CAD :

Installation and launching AutoCAD latest version, understanding and applications of software interface, Pick point in the drawing area, Saving a file and working with multiple files, Understanding paper area, Unit, Scale, Planes, Using the UCS icon, Design template, Types and use of 2D, Drafting tools, Dimensioning, 2D keyboard command.

2D isometric views, hatch, Reference other drawing files, Work with data in other formats and exporting 2D drawings to various software, extract data from drawings and spread sheet, Access external database.

Layer management, Plotting and publishing the drawing in modal space and paper space.

Shading and Rendering Through Photo Shop :

Installation of Photoshop latest version, Understanding and applications of software interface, Keyboard commands.

Transformation like translation, rotation, scale, shear etc., Picture editing, Shading and rendering, different materials applied in rendering, extract data from other files.

The seminar be added in which the student would present his drawing in front of a jury consisting of external architects so that they may improve in expressing themselves and may get further ideas from External/Outsider Architects/Professional from an architectural institution/college. (TA and DA etc. should be provided by the institution).

NOTE:

Three study visits ( to U. P. and the adjoining States) shall be organised and a report will be prepared for award of sessional marks. The visits shall cover Historical, Architectural and Structural aspects.

#### 4.6 HISTORY OF ARCHITECTURE -B

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 improvements and renovation. So is the paper here to give 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 Style	12	9	-
2.	Western Style	10	5	-
3.	Modern Style	20	14	-
		42	28	-

##### DETAILED CONTENTS

###### 1. INDIAN STYLE:

Islamic architecture in India. Architecture of pathan dynesties and their works in Delhi region (Imperial style) provincial styles like Punjab, Bengal, Ahmedabad, Malwa, Bijapur and Mughal Architecture in Delhi region.

###### 2. WESTERN STYLE:

Historical architecture, Gothic Renaissance and Baroque.

###### 3. MODERN STYLE:

Modern trends in Architecture, its concept and scope, Works and Philosphy of eminent architects like Frank Lloyed Wright, Walter Groupius and Behaus, Lecorbusier, Mies Vander Rohe, etc., Works of Indian Architects like Uttam Chand Jain, Charl's Coriea, B. V. Doshi, A. P. Kanvinde, etc.

The years work should include class assignments sketches and an analystical study with sketches and reports of an existing structure / building / monuments.

##### NOTE:

History of Architecture is to be taught with a view towards understanding how different Architectural solutions were evolved (In successive historical periods) with in the restraints imposed by prevalent social and religious customs, available building materials, complex structural problems and the limited technology avaiialble at the time.



## 5.1 INTEGRATIVE COMMUNICATION

L	T	P
-	-	4

## TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction to Personality Development	-	-	02
2.	Factors Influencing / Shaping Personality	-	-	02
3.	Self Awareness - 1	-	-	03
4.	Self Awareness - 2	-	-	02
5.	Self Awareness - 3	-	-	02
6.	Change Your Mind Set	-	-	02
7.	Interpersonal Relationship and Communication	-	-	03
8.	Non-Verbal communication Communication Skills	-	-	02
9 .	Communication Skills ACTIVITIES	-	-	06
10.	Body Language skills	-	-	03
11.	Leadership Traits & Skills	-	-	03
12.	Attitude	-	-	03
13.	Analyzing & Solving a Problem skills	-	-	02
14.	Time Management skills	-	-	03
15.	Stress Management Skills	-	-	02
16.	Interview Skills	-	-	04
17.	Conflict Motives	-	-	02
18.	Negotiation / Influencing Skills	-	-	02
19.	Sociability	-	-	03
20.	Importance of Group	-	-	03
21.	Values / Code of Ethics	-	-	02
		-	-	56

## PERSONALITY DEVELOPMENT

**1 Introduction to Personality Development**

AIM, Skills, Types of Skills, LIFE SKILLS VS OTHER SKILLS, Concept of Life Skills. Ten core Life Skills identified by

WHO

**2. Factors Influencing / Shaping Personality :**

Introduction, Physical and Social Factors Influencing / Shaping

Personality (Hereditary, Self-Development, Environment, Education, Life-situations ) Psychological AND Philosophical Factors Influencing / Shaping Personality ( Past Experiences, Dreams and Ambitions, Self-Image, Values)

**3. Self Awareness - 1**

DIMENSIONS OF SELF AWARENESS ( Self Realization, Self Knowledge or Self Exploration, Self Confidence, Self Talk, Self

Motivation, Self Esteem, Self Image, Self Control, Self Purpose, Individuality and Uniqueness, Personality, Values, Attitude, Character ), SELF REALIZATION AND SELF EXPLORATION

THROUGH SWOT ANALYSIS AND JOHARI WINDOW,

**4. Self Awareness - 2**

SYMPATHY VS EMPATHY AND ALTRUISM,  
Importance of Empathizing with Others,

**5. Self Awareness - 3**

Self-Awareness through Activity, Body Image ( What is Body Image, What Decides our Body Image, What is Poor Body Image, What are the Harmful Effects of Poor Body Image ), Tackling Poor Body Image( Enhance Self-Esteem, Build Up Critical Thinking, Build up Positive Qualities, Understand Cultural Variation, Dispel Myths, Utilize Life Skills )

**6. Change Your Mind Set**

What is Mindset, HOW TO CHANGE YOUR MINDSET ( Get the Best Information Only, Make the best people your Role Model, Examine Your Current Beliefs, Shape Your Mindset with Vision and Goals, Find Your Voice, Protect Your Mindset, Let Go of Comparisons, Put An End To Perfectionism, Look At The Evidence, Redefine What Failure Means, Stop Worrying About What "People" Think)

**INTERPERSONAL SKILLS**

**7. Interpersonal Relationship and Communication**

INTERPERSONAL RELATIONSHIP , Forms of Interpersonal Relationship, Must Have in an Interpersonal Relationship, Interpersonal Relationship between a Man and a Woman ( Passion, Intimacy, Commitment), Relationship Between Friends, ROLE OF COMMUNICATION IN INTERPERSONAL RELATIONSHIP ( Take Care Of Your Tone And Pitch, Choice of Words is Important in Relationships, Interact Regularly, Be Polite, Try To Understand The Other Person's Point Of View As Well, Individuals Can Also Communicate Through Emails,

**8. NON-VERBAL COMMUNICATION Communication Skills**

Non-Verbal Communication,  
We Communicate with Our Eyes, Communication with Facial Expression, A Good Gesture, Appearance, Posture and Gait, Proximity and Touch ), IMPORTANCE OF LISTENING,  
Characteristics of Good and Effective Listener( Is Attentive,

Do

Not Assume, Listen for Feelings and Facts, Concentrate on the Other Speakers Kindly and Generously, Opportunities)

**9. Communication Skills ACTIVITIES -**

Activities in Making Collages, Making Advertisements, PPT Preparation &

Presentation, Speaking -Seminars, Group Discussions, Debates, Extempore Speeches, Listening to an audio clip and telling

its

gist, Answering a telephone call, Making enquiries, General

tips-

Pronunciation, Tone, Pitch, Pace, Volume, relevance, brief, simple Reading Newspaper, Magazines ( Current Affairs,

Economic magazines, Technical magazines), How to read a report, article, Writing- Resume Writing, Writing joining report,  
Notice writing, Report making, Proposal writing, Advertisement,  
Notice for tender, Minutes writing, E-Mail writing, Listening News, Listening to audio clips.( Lecture, poetry, speech, songs),

#### **10. Body Language skills**

Introduction, What is Body Language , Body Language Parts, Personal Space Distances (Intimate Distance, Personal Distance,  
Social Distance, Public Distance), IMPORTANT BODY LANGUAGE SIGNS AND THEIR MEANING

#### **UNDERSTANDING OTHERS**

#### **11. Leadership Traits & Skills :**

Introduction, Important Leadership Traits (Alertness, Bearing,  
Courage, Decisiveness, Dependability, Endurance, Enthusiasm, Initiative, Integrity, Judgment, Justice, Knowledge, Loyalty, Sense  
of Humour), Other Useful traits (Truthfulness, Esprit-de-corps,  
Unselfishness, Humility and sympathy, Tact without loss of moral  
courage, Patience and a sense of urgency as appropriate, Selfconfidence,  
Maturity, Mental including emotional stability)

#### **12. Attitude**

Types of Attitude, Components of Attitudes (Cognitive Component, Affective Component, Behavioral Component ),  
Types of Attitudes (Positive Attitude, Negative Attitude, Neutral  
Attitude, Rebellious Attitude, Rational and Irrational Attitudes,  
Individual and Social Attitudes), Kinds of Attitude, ASSERTIVENESS, How to Develop Assertiveness (Experiment and Try New Things, Extend Your Social Circle, Learn to Make Decisions for Yourself, Indulge in Knowledge, Admire Yourself  
&  
Others), Negotiation (Be Sensitive to The Needs Others, Be Willing To Compromise, Develop Your Problem-Solving Skills, Learn to Welcome Conflict, Practice Patience, Increase Your Tolerance For Stress, Improve Your Listening Skills, Learn To Identify Bottom-Line Issues Quickly, Be Assertive, Not Aggressive)

#### **PROBLEM SOLVING**

**13. Analyzing & Solving a Problem skills**

Critical Thinking, Creative Thinking, Decision Making, Goal Setting & Planning, Problem Solving

**14. Time Management skills**

Need of Time Management, TIME WASTERS (Telephone, Visitors , Paper work, Lack of Planning & Fire Fighting , Socializing , Indecision , TV , Procrastination ), PRINCIPLES

OF

TIME MANAGEMENT - Develop a Personal Sense of Time (Time Log , value of other people's time ), Identify Long-Term Goals ,

Concentrate on High Return Activities , Weekly & Daily Planning

(The Mechanics of Weekly Planning , Daily Planning ), Make the

Best Use of Your Best Time , Organize Office Work

(Controlling

Interruptions , Organizing Paper Work ), Manage Meetings, Delegate Effectively, Make Use of Committed Time, Manage Your Health,

**15. Stress Management Skills**

INTRODUCTION, Understanding Stress and its Impact, Expected Responses (Physical, Emotional, Behavioral), stress signals(thoughts, feelings, behaviors and physical), STRESS MANAGEMENT TECHNIQUES (Take Deep Breath, Talk It Out, Take A Break, Create a Quiet Place in Your Mind, Pay

Attention

to Physical Comfort, Move, Take Care of Your Body, Laugh, Manage Your Time, Know Your Limits, Do You Have To Be Right Always, Have A Good Cry, Look for the Good Things Around You, Talk Less, Listen More), UNDERSTANDING EMOTIONS AND FEELINGS-through Activity

**16. Interview Skills ( 2 sessions from Industry Expert is Compulsory)**

Curriculum Vitae (When Should a CV be Used, What Information Should a CV Include, personal profile, Covering Letter, What Makes a Good CV, How Long Should a CV Be, Tips on Presentation), Different Types of CV (Chronological, Skills-Based ), BEFORE THE INTERVIEW , CONDUCTING YOURSELF DURING THE INTERVIEW , FOLLOWING THROUGH AFTER THE INTERVIEW , Interview Questions To Think About , MOCK INTERVIEW - Activity (MOCK INTERVIEW EVALUATION - NON-VERBAL BEHAVIORS, VERBAL BEHAVIORS, General Etiquettes to face the Board , Telephonic interview

**17. Conflict Motives -Resolution**

Motives of Conflict( Competition for Limited Resources, The Generation Gap and Personality Clashes, Aggressive Personalities, Culturally Diverse Teams, Competing Work and Family Demands, Gender Based Harassment), Merits and

Demerits of Conflict , Levels of Conflict (Interpersonal Conflict, Role Conflict, Inter-group Conflict, Multi-Party Conflict, International Conflict ), Methods of Conflict Resolution (The Win-Lose Approach, The Lose-Lose Strategy, The Win-Win Approach), Techniques for Resolving Conflicts (Confrontation and Problem Solving Leading to Win-Win, Disarm the Opposition, Cognitive Restructuring, Appeal to Third Party, The Grievance Procedure)

#### **18. Negotiation / Influencing Skills**

Why Influencing, What Is Influencing, TYPES OF INFLUENCING SKILLS (Probing And Listening, Building Rapport, Sign Posting, Pacing, Selling, Assertiveness), LAWS AND PRINCIPLES OF INFLUENCE, The Six Laws of Influence (The Law of Scarcity, The Law of Reciprocity, The Law of Authority, The Law of Liking, The Law of Social Proof, The Law of Commitment and Consistency), Influencing Principles (Making a Start, Buy Yourself Thinking Time, Dealing With Disagreement, Difficult And Sensitive Situations)

#### **19. Sociability : Etiquettes And Mannerism & Social Skills**

Need for Etiquette , Types of Etiquettes (Social Etiquette, Bathroom Etiquette, Corporate Etiquette, Wedding Etiquette, Meeting Etiquette, Telephone Etiquette, Eating Etiquette, Business Etiquette, E-Mail Etiquettes, ), MANNERISMS, HOW TO IMPROVE YOUR SOCIAL SKILLS (Be Yourself, Be Responsible, Be Open & Approachable, Be Attentive, Be Polite, Be Aware, Be Cautious)

#### **20. Importance of Group / Cross Cultural Teams / Team Work skills**

Introduction, Types and Characteristics of Groups (Definition of a Group, Classification / Types of Groups, Friendship Group, Task Group, Formal Groups, Informal Group, Effective Group), Importance of a Group, Characteristics of a Mature Group, TYPES AND CHARACTERISTICS OF A TEAM ( Definition of a Team, Types of Teams, Functional Teams, Problem Solving Teams, Cross - Functional Teams, Self - Managed Teams), Importance of a Team, Characteristics of a Team

#### **21. VALUES / CODE OF ETHICS**

Meaning, A FEW IMPORTANT VALUES (Honesty, Integrity, Purity, Discipline, Selflessness, Loyalty, Fairness, Equality, Trust, Support, Respect, etc)

Note : One Orientation module for the faculty is must.  
Involvement of Industry Experts is necessary for  
Interview Skills

## 5.2 ARCHITECTURAL DESIGN-C

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

L T P  
4 - 20

### RATIONALE

The architectural design has been devided in five papers A,B,C,D & E. 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 catagories of buildings of common use. The paper-D & E 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
1.	Studio	12	-	-
2.	Working Drawing	12	-	-
3.	Interior Schemes and Architectural Forms	12	-	-
4.	Computer Graphics	10		
5.	Model	10	-	-
		56	-	280

### 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, Set backs, 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, sloppy site, building orientation, space placement and proposed materials should be support to climatic responsive building.

Design exercises could be focused on residential apartment building, inter college, commerical 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 be reflect the understanding of fundamentals inter space arrangement 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, specially in residential houses, offices, Entrance halls etc. plans, Elevations and colour schemes.

Arctitectural Murals for different types of buildings such as Auditorium, Recreation, Museaums etc. Rendering and land scaping of all types of perspectives in pencil, ink and colours.

4. COMPUTER GRAPHICS

3D DRAWING SOLUTION THROUGH AUTO CAD/3D MAX AND RAVIT :

Understanding and application of 3D modeling, Types and use of 3D modeling tools, Modify 3D solids and surface. Create section and 2D drawing from 3D models. 3D keyboard commands, Materials and textures, Reference other drawing files. Work with data in other formats and exporting 3D models to various software's

Define a 3D view with a camera, Create preview animations and create motion path animations, Creating a simple 3D mesh, Editing face and edges, Creating mesh surface, Converting meshes to solids, Editing surface

Exporting 3D to work in other software, Plotting and publishing the drawing in modal space and paper space.

SHADING AND RENDERING THROUGH PHOTOSHOP :

Advance rendering to create final image of 3D modeled in Auto Cad and rendered in 3D max.

5. MODEL:

One model of a design to be prepared by the students for which materials etc. shall be supplied from the institution. The photographic mount board, Wood, Acrylic sheet may be used for making models.

NOTE :

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



### 5.3 EARTHQUAKE ENGINEERING CONCEPT

L T P  
3 1 -

#### RATIONALE

In view of earthquake risk in the country, it is important that students of architectural assistantship Government Polytechnic are taught principles of earthquake engineering.

#### Topic Wise Distribution of Periods

Sl.No.	Topics	Coverage Time		
		L	T	P
1.	Topic 1	2	1	-
2.	Topic 2	6	2	-
3.	Topic 3	12	3	-
4.	Topic 4	2	1	-
5.	Topic 5	2	1	-
6.	Topic 6	2	1	-
7.	Topic 7	2	1	-
8.	Topic 8	4	1	-
9.	Topic 9	10	3	-
		42	14	-

#### 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,
  - Epicentre,
  - Epicentre distance,
  - Focal depth,
  - Peak ground acceleration, etc.
- Seismic Zoning and Micro Zoning.

### 3. BEHAVIOUR OF BUILDINGS DURING EARTHQUAKE :

- Ground motion and earthquake forces;
- Siting 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.

#### LIST OF 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. IITK-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](http://www.nicee.org) for anyone to download. These are very suitable for teachers and students of 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](http://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](mailto: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 free 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 STRUCTURE - B

L T P  
5 3 -

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 Assistentship will be required to handle such simple structures in his professional life.

This subject covers designing of simple structures out of heterogenous materials (RCC). The student will also learn to use the latest relevant IS codes in his design practice.

(Use of IS:456-2000 is allowed)

TOPIC WISE DISTRIBUTION OF PERIODS

Sr. No.	Concept	DISTRIBUTION OF PERIODS		
		L	T	P
1.	Introduction to RCC structures	4	3	
2A.	Design based on limit state method			
	I Fundamentals	8	4	
	II Singly reinforced beam	4	4	
	III Lintels	4	4	
	IV Cantilever beam and slabs	6	3	
	V Doubly Reinforced Beam	4	3	
	VI Reinforced concrete Slabs	6	3	
	VII Reinforced brick work	4	3	
	VIII Tee beams	6	3	
	IX Columns & Column Footings	6	3	
3.	Introduxtion To working stress Method	6	3	
4.	Pre-Stressed Concrete	6	3	
5.	Introduction To Tension & Compression Members	6	3	
		70	42	-

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 slabs 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).



## 5.5 ENVIRONMENTAL POLLUTION & CONTROL

[Common to three year diploma courses in Civil Engineering, Civil Engg. Spl. in Rural Engg., Civil Engg. Spl. in Water Resource Management, Civil Engg. spl. in Environmental, Pollution & control)

L T P  
4 1 -

### RATIONALE

A Civil Engineering technician must have the knowledge of different types of pollution caused due to industrialisation and construction activities so as he may help in balancing the eco system & control pollution by providing controlling devices.

The contents of this subject have been developed to cater the above needs.

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Ecology of environment	3		
2.	Pollution and its classification	6		
3.	Water pollution	9		
4.	Air pollution	8		
5.	Solid Waste pollution	6		
6.	Noise pollution	6		
7.	Thermal Pollution	6		
8.	Radio Active Pollution	6		
9.	Legislation	6		
TOTAL		56	14	-

### CONTENTS

#### 1. ECOLOGY OF ENVIRONMENT:-

Elements of environment: Earth, water, air, space and energy. Ecology: Living and non living concept leading to ecology. Ecosystem: Terrestrial, aquatic and marine affect of environmental pollution on ecological balances.

#### 2. POLLUTION AND ITS CLASSIFICATIONS

Definiton, classification, air, water, solid waste, thermal, noise and radio active pollutions. Different parameter of pollution.

#### 3. WATER POLLUTION:-

Sources, transport of pollutants, effect of water pollutants on man, animal, plant and material, various types of pollutants. Mainly discuss various types of wastes from

community, general characteristics of domestic & industrial wastes and their affects on environment, disposal methods on land and water, criteria of disposal by dilution. Stream sanitation. Sampling and monitering instrumentation for water pollution and control.

4. AIR POLLUTION:-

Sources, types of air pollutants, Transport of air pollutants, dispersion by single and multile sources. Control equipment, filter, electrostatic precipitators, wet scrubbers, fume combustion by incineration. Air pollution control in new and old plants.

5. SOLID WASTE POLLUTION:-

Review of various types of solid waste. sources, components of solid waste, city garbage and industrial solid waste handling and disposal equipment . Method of disposal, salvage and recovery. Volume reduction in solid waste.

6. NOISE POLLUTION:-

Sources, measurement of pollution. Degree of noise. Echos and their control. Industrial noise, units characteristics occupational injuries due to noise, criteria and standard for occupational injuries due to noise. Means to control noise in industry.

7. THERMAL POLLUTION:-

Various pollutants. Affects on environment, preventive measures.

8. RADIO ACTIVE POLLUTION:

Sources and affect on human, animals, plants and materials, measurement, means to control, preventive measures.

9. LEGISLATION :

Preliminary knowledge of the following Acts and rules made thereunder-

- The Water (Prevention and Control of Pollution) Act - 1974.
- The Air (Prevention and Control of Pollution) Act - 1981.
- The Environmental Protection (Prevention and Control of Pollution) Act -1986. Rules notified under EP Act - 1986

Viz.

- # The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000
- # The Hazardous Wastes (Management and Handling ) Amendment Rules, 2003.
- # Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003.
- # The Noise Pollution (Regulation and Control) (Amendment) Rules, 2002.
- # Municipal Solid Wastes (Management and Handling) Rules, 2000.
- # The Recycled Plastics Manufacture and Usage (Amendment) rules, 2003.

## 6.1 CONSTRUCTION AND MATERIALS-C

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 their knowledge is also vital. These materials have been given place in this paper to make the knowledge complete.

## TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Materials	12	-	-
2.	Foundations	12	-	-
3.	Temporary Work	12	-	-
4.	Roofs	12	-	-
5.	Partitions	12	-	-
6.	Interiors	16	-	-
7.	Hardware Construction & Equipment	8		
		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. 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 panelling 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 EQUIPMENTS:

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.

## 6.2 MANAGEMENT, ACCOUNTS AND PROFESSIONAL PRACTICE

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

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, Organisation and building contracts. Acquaintance 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 Acts 1972, Council of Architects, Tender documents, Stages of payments, Settlement of disputes and arbitrations.

#### 9. 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 Nonpatentable invention including product versus Process. Basic terms used in land aquasition, Khasra, Khataoni, possession, allotment, free hold, Dhakhil-Kharig

## 1. DESIGN PROJECT:-

The project will be of 4 months duration. The main emphasis will be on developing the problem coordinating various factors effecting 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 ventilation 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, electrical wiring and decorative electrical installations.
- (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 pencele ).  
(40% Marks)

All these stages shall have remains which will be presented by the students to a jury consisting of at least one external member nominated by the institute may be a practicing Architect/Teacher of Architectural institution and shall have marks divided in all the three stages which shall be combined together at the end. (The expenditure incurred on calling the experts will be born 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).

## FIELD EXPOSURE

4 Weeks, structured supervised, branch specific, task oriented Industrial/Field exposure to be organised during summer vacation

The student during the vocational training must undergo training in at least one of the following:

1. TOPOGRAPHICAL MAP:

Survey work with the help of level and plane table and prepare the map showing contours.

2. DESIGN AND DRAWING OF RESIDENTIAL/MULTISTORIED STRUCTURE:

Designing plan, Elevation, Sections, Prespective view of residential/multistoried framed structure.

3. DESIGN AND DRAWING OF PUBLIC/OFFICE BUILDINGS ETC.

Designing plans, Elevation and Sections of Clinics, Nursery and Public Schools, Restaurants, Shops, Sub post offices etc.

4. PLANNING OF COLONIES:

Site developemt of coloney, Planning of site in respect of residential houses, Parks, School, Primary Health Centre, Sub Post Office, Bank Branch Office, Public Library Building, Recareation Centre, Shoping Centre etc.

5. INTERIOR SCHEMES:

Preparing interior schemes for residential rooms, Offices, Restaurant, Library, Shops, Auditorium, Recreation Centre, Museaums, Hotels.

6. ARCHITECTURAL FORMS:

Architectural murals for different types of buildings such as Auditorium, Recreation, Museaums, Schools, Hotels, Restaurants.

IX.

STAFF STRUCTURE

THREE YEAR(SIX SEMESTER) DIPLOMA IN ARCHITECTURAL ASSISTANTSHIP

Intake 60  
Pattern Semester

Sl. No.	Name of Post	No.
1.	Principal/HOD	1
2.	Lecturer Architecture	5
3.	Lecturer in Civil Engg.	3
4.	Lecturer in Physics/Chemistry	1
5.	Lecturer in Maths	1   Parttime/Common
6.	Lecturer in Comm. Tech.	1   with other dis-
		1   ciplines if the
		1   intake is more
		1   than 180
7.	Lecturer in Art	1 Parttime
8.	Computer Programmer	1
9.	Workshop Instructors	3
10.	Steno Typist	1
11.	Accountant / Cashier	1
12.	Student / Library Clerk	1
13.	Store Keeper	1
14.	Class IV	6
15.	Sweeper	Part time
16.	Chaukidar & Mali	As per need with justification

Note :

1. The number of staff required for individual institution shall be worked out in accordance with the norms laid down in G.O. No. 2281/Pra.Shi.-3-1989-60(B)/85 Dated June 27, 1989
2. Services of the staff of other disciplines' of the Institute may be utilized.
3. The post of "Computer Programmer" is not needed in the institutions where diploma in "Electronics Engineering" is running.
4. QUALIFICATIONS OF STAFF : as per service rules.

X. SPACE REQUIREMENT  
 [A]. Administrative Block

	No.	M2
1. Principal's room	1	30
2. Steno room	1	6
3. Confidential room	1	10
4. Reception Lounge	1	25
5. Main Office	1	(0.25 Sqm./Student)
6. Library (common with other disciplines)	1	150
7. Common room		
A. Boys Common Room	1	50
B. Girls Common Room	1	50
C. Staff Common Room	1	50
8. Store (100+0.1xStudent Population)	1	109
9. Conference Room	1	75
10. Head of Department Room	1	15
11. Lecturer Room		(10 Sqm./Lecturer)
12. Confidential Office for Examination work	1	25
13. Estate Office (Security,Campus,Services)	1	25

[B] Academic Block

Sl.No.	Detail of Space	No.	@ Sqm	Floor Area Sq.m.
1.	Class Room	2	60	120
2.	Studios	3	120	360
3.	Physics Lab			75
4.	App. Mechanics Lab.			60
5.	Art Studio	1		60
6.	Surveying Store	1		20
7	Computer Lab (Air Cond.,Glass Partition, Special type PVC flooring and false ceiling )			60

[C] Work shop

I	Workshop Supdt. Room	12
II	Store	20
III	Shops	
(a)	Carpentry Shop	50
(b)	Smithy Shop	70
(c)	Fitting Shop	50
(d)	Welding Shop	50
(e)	Painting Shop	50
(f)	Sheet Metal ,Soldering & Brazing shop	50
(g)	Plumbing shop	50
(h)	Machine Shop	150
(i)	Foundry	75

[D]. Common Facilities

1.	Dispensary	1	75
2.	Canteen, Cooperative Store,Bank Extension Centre, Postal Services etc.	1	150
3.	Parking space		
A.	Cycle Stand		(1 Sqm./Cycle For 25% Students)
B.	Scooter Stand		(3 Sqm./Scooter For 25% Students)
C.	Car Garage		(15 Sqm./ Car )
D.	Bus Garage		(55 Sqm./ Bus )
4.	N.C.C. block	1	(2 Sqm/Student)

5. Guest room (with 2 guest rooms and service facility) 1 100

[E]. Residential Facilities

- |                             |   |  |
|-----------------------------|---|--|
| 1. Hostel for students      | 1 | for 50% boys & 100% girls students to be provided in seperate block) |
| 2. Staff quarters           |   |  |
| Principal/HOD               | 1 | Type IV  |
| Lecturer                    | 4 | Type IV  |
| Technical/Ministerial staff | 4 | Type II  |
| Class IV                    | 6 | Type I   |
| 3. Play ground (common)     | 1 | 1500-2500 Sqm depending upon availability of land                    |

Priority to be given in following order

- (1)
- a. Administrative Building
  - b. Labs
  - c. Workshop
  - d. Over Head Tank
  - e. Boundary Wall
  - f. Principal Residence
  - g. Class IV Quarters (2/3)
- (2)
- a. Hostel
  - b. Students Aminties
- (3)
- Residences of employees

LIST OF EQUIPMENTS

Only those of the equipments given below which are essentially required for the conduction of practicals mentioned in the curriculum are to be procured by the institutions.

"Machine/Equipments/Instruments of old BTE list which are not included below are to be retained in the Lab/Shop for Demonstration purpose but not to be demanded fresh for purchase."

NOTE : Equipment for different shop and lab of latest version should be purchased.

I. APPLIED PHYSICS LAB

S.No.	Name of Equipment	No.	@ Rs. Aprox.	Amt.in Rs. Aprox.
1.	Brass ball with hook dia 1.8 Cm to 2 Cm diameter	2	50	100
2.	Stop watch least count Least Count 0.1 Sec.(non-magnetic) 0.01 sec to 0.001 sec (Electronic Desirable)	4	750	3000
3.	Wall bracket with clamping arrangement 8" to 10" length	2	50	100
4.	Meter scale Least count 0.1cm, wooden 1meter	5	40	200
5.	Meter scale Least count 0.1cm, wooden 50 Cm	5	40	200
6.	Searl's conductivity apparatus with copper & steel rods 25 cm length 4 cm.diameter with all accessaries	2 set	1500	3000
7.	Constant Level Water Flow Container of one liter capacity vertical stand & rubber tubing	2	250	500
8.	Thermometer 0-110oC(Least count 0.1oC desirable)	4	100	400
9.	Potentiometer - 10 wires (1 meter length of each wire) with jockey, sunmoical top	4	750	3000
10.	Moving coil galvenometer 30-0-30 with moving mounting	5	300	1500
11.	Rheostat 50 ohm., 100 Ohm., 150 Ohm. 16 capacity	16	300	4800
12.	Lead Accumulator 2V, 6V (1 No. Each)	2	250	500
13.	Meterbridge 1 meter length, sunmica top copper strips fitted with scale	2	300	600
14.	Resistance Coil (Standard) 1 ohm. to 10 ohm.	10	50	500
15.	Moving coil ammeter 0-1 amp., 0-2 amp., 0-5 amp. with mounting	8	250	2000
16.	Moving coil voltmeter 0-1 V., 0-2V 0-5 V., 0-10 V. with mounting	8	250	2000
17.	Denial cell with complete accessories	2	250	500

S.No.	Name of Equipment	No.	@ Rs. Aprox.	Amt.in Rs. Aprox.
18.	Leclanche Cell with complete accessories	2	250	500
19.	Standard Cadmium Cell with complete accessories	2	250	500
20.	Battery Charger with complete accessories	1set	1800	1800
21.	Battery Eliminator Multi range	2set	750	1500
22.	Multimeter(Digital)	1set	800	800
23.	Carey Foster Bridge (With all accessories)	2set	4500	9000
24.	Resistance Box (2 No. Each) 0-1 Ohm, 0-100 Ohm.	4	850	3400
25.	Fractional Resistance Box 0-1 Ohm.	2	1200	2400
26.	Post office box Key type	2	1200	2400
27.	Post office box Dial type	2	1200	2400
28.	Resistance Wire(100 Gm.) (Constanton/Maganin)	1 lacchi	100	100
29.	Connecting Wire Copper(1/2 Kg.) (Cotton Insulated)	1 lacchi	700	700
30.	Screw gauge L.c 1/100 mm	5set	150	750
31.	Vernier Callipers L.c. 1/10 mm	5set	100	500
32.	Appratus for determining character- stics of P-N junction diode complete with all accessories	2 set	1500	3000
33.	Resonance Column of steel One Meter length and 3-4 Cm diameter fitted with scale & water level arrangement	2	1600	3200
34.	App. for determining coefficient of friction on a horrizontal plane (Complete with all accessories)	2 set	700	1400
35.	Tuning Fork's Sets Set of different frequency (with rubber pad)	3set	350	1050
36.	Physical balance with weight box Complete with Fractional weight	2	800	1600
37.	Anemometer with counter cup type	1	1000	1000
38.	Spring Force Constant Apparatus with graduated mirror & pointer, weight set with hanger	2	1200	2400
39.	Viscosity Apparatus (Stock law) with steel balls and viscous liquid & timer	2set	1600	3200
40.	Thermometer of different range Mercury thermometer 0-50oC to 0-110oC	10set	100	1000
41.	Wall Thermometer Alcohol Filled 0-50oC	2set	20	40
42.	Sprit Level Technical Type	1set	60	60
43.	Drilling Machine Electric with different size bits	1set	800	800
44.	LPG Gas Burner with Cylinder	1set	800	800
45.	Tool Kit with different tools Complete	1set	800	800
46.	Lab stools	30		

S.No.	Name of Equipment	No.	@ Rs. Aprox.	Amt.in Rs. Aprox.
47.	Lab tables	8		
48.	Plug Keys One Way	5	50	250
49.	Plug Keys Two Way	5	100	500
50	Helical Springs - Soft, 10 cm each	6	100	600



II. APPLIED MECHANICS LAB

Sl.No.	Name of Equipment	No.	Rate	Amount
1.	Polygon of Forces Apparatus	4	1500	60000
2.	Universal Force Table	2	2500	5000
3.	Principle of Moment Apparatus Bell Crank lever	4	1500	60000
4.	Combined Inclined plane & Friction apparatus	4	1500	60000
5.	Simple wheel and axle	2	2500	5000
6.	Differential wheel and axle	2	3500	7000
7.	Double sleeve Pulley Block	1	800	800
8.	Simple Screw Jack	4	3000	12000
9.	System of pulleys (Any I,II,III)	2Set Each	4000	8000
10.	Worm & Worm wheel	2Set Each	5000	10000
11.	Simply Support Beam with different weights (2 Sets)	2	3000	6000
12.	Jib Crane	2	2500	5000
13.	Jointed Roof Truss Apparatus	2	2500	5000
	Misc.	Lum Sum		5000

Note :

- S. No. 1,2 Acrylic/Wood material/Aluminium Cast
- S.No. 3,4,5,8,9 working model of Acrylic/Aluminium/Cast
- Above items are for 2 batches of 15 students each.

III. WORKSHOP PRACTICE

1. CARPENTRY SHOP

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
1.	60 cm.rule	10	15	150
2.	Flexible steel rule 2 metre	2	20	40
3.	T square 23 cm. steel	10	20	200
4.	Bevel square 23 cm. steel	2	30	60
5.	Marking knife 25 cm. steel	10	30	300
6.	Marking gauge wooden & brass 25 cm.	10	30	300
7.	Mortise gauge wooden & brass 25 cm.	10	50	500
8.	Caliper inside, steel 20 cm.	2	50	100
9.	Caliper outside , steel 20 cm.	2	50	100
10.	Compass steel 20cm.	2	40	80
11.	Devicer steel 20 cm.	2	40	80
12.	Plumb	2	20	40
13.	Wooden bench vice steel 20 cm.	10	200	2000
14.	Bench hold fast steel 30 cm.	10	40	400
15.	Bar clamp 2 m.	2	300	600
16.	G clamp of flat spring steel 20x30 cm.	4	60	240
17.	Rip saw 40-45 cm.	10	80	800
18.	Cross cut saw 40-45 cm.	2	80	160
19.	Tennon saw 30-35 cm.	10	50	500
20.	Dovetail saw 30-35 cm.	2	60	120
21.	Compass saw 35 cm.	4	60	240
22.	Key hole saw or pad saw 30-35 cm.	2	25	50
23.	Bow saw	2	25	50
24.	Frame saw	2	25	50
25.	Chisel fish brand 1" to 1/8" firmer	3 set	100	300
	Dovetail	3 set	100	300
	Mortise	3 set	100	300
26.	Gauge or Golchi 1" to 1/8"	3 set	150	450
27.	Wooden jack plane complete	10	100	1000
28.	Wooden smoothing plane	10	80	800
29.	Iron jack plane complete	10	200	2000
30.	Iron rebate plane complete	3	80	240
31.	Iron grooving plane complete	3	120	360
32.	Iron compass plane complete	3	200	600
33.	Wooden moulding plane complete	3	200	600
34.	Bradawl	3	150	450
35.	Gimlet drills set	1 set	150	150
36.	Center bit	2	120	240
37.	Twist bit	2	80	160
38.	Auger bit	2	40	80
39.	Dovetail bit	2	15	30
40.	Counter shank bit	2	20	40
41.	Ratchet brace machine	2	175	350
42.	Grand drill machine 1/4" burmi	2	200	400
43.	Wooden hand drill	5	200	1000
44.	Wooden mallet	10	25	250
45.	Claw hammer	3	30	90
46.	Carpenters hammer	10	30	300
47.	Turning tool set for lathe	3 set	800	2400
48.	Screw driver 18" & 15"	6	50	300

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
49.	Adze 500 gm.	10	50	500
50.	Pincer 175 mm.	6	75	750
51.	Plier 150 mm.	4	90	360
52.	Oil stone 8"	4	75	300
53.	Rasp file 12"	4	100	400
54.	Half round file 12"	4	80	320
55.	Round file 12"	4	80	320
56.	Triangular file 5", 4"	8	60	480
57.	Water stone	4	20	80
58.	Carpentry work benches	4	2000	8000
59.	Band saw machine complete	1	30000	30000
60.	Circular saw machine	1	15000	15000
61.	Grinding machine with motor	1	6000	6000
62.	Universal wood working machine	1	15000	15000
	misc. for foundation of machines	LS		10000

## 2. PAINTING & POLISHING SHOP

1.	Air compressor complete with 2 HP motor	1set	12000	12000
2.	Spray gun with hose pipe	1	1000	1000
3.	Stoving oven	1	3000	3000
4.	Buffing machine with leather and cotton wheels	1	4000	4000
5.	Electroplating Equipment for cromium Nikle plating.	1	10000	10000
	Misc.		L.S.	2000

## 3. SHEET METAL,

1.	Dividers - 15cm.	5	60	300
2.	Trammel 1 m.	1		
3.	Angle protector	5	60	300
4.	Try square 30 cm.	5	40	200
5.	Centre punch	5	20	100
6.	Steel rule 30 cm. , 60 cm.,	5	25	125
7.	Sheet metal gauge	1	120	120
8.	Straight snips 30 cm.	2	250	500
9.	Curved snips 30 cm.	2	300	600
10.	Bench shear cutter 40 cm.	1	5000	5000
11.	Chisel 10 cm.	5	100	500
12.	Hammer	5	150	750
13.	Bench vice 13 cm.	5	1000	5000
14.	Plier	5	50	250
15.	Nose plier	5	60	300
16.	Sheet metal anvil/stakes	5	2000	10000
17.	Shearing machine 120 cm.	1	2500	2500

4.

## PLUMBING SHOP

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
1.	Pipe vice 5 cm.	4	250	1000
2.	Chain wrenches	5	250	1250
3.	Ring spanner Set	5	125	625
4.	Wheel pipe cutter	2	300	600
5.	Water pump plier	4	50	200
6.	Pipe die set 2" set	2 set	600	1200
7.	Pipe bending device	1	5000	5000
8.	Work benches	4	4000	16000
9.	Set of various types of plumbing fittings e.g. Bib cock, Cistern, Stop cock, Wheel volve, Gat volve etc.		L.S.	2000
10.	Misc. Hacksaw frame and others		L.S.	2000

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
IV CLASS ROOMS				
1.	Class Room Tables & Chairs	60	2000	120000
2.	Platform Tables	2	9000	18000
3.	Arm Chairs Steel	2	2500	5000
4.	Graph Board	2	4000	8000
5.	Lecture Stand	2	6000	12000
V ART ROOM				
1.	Tables	60	15000	900000
2.	Stools Donkey	60	800	48000
3.	Table	1	8000	8000
4.	Chair	1	4000	4000
5.	Easels	30	3500	105000
VI STUDIO ROOMS				
1.	Studio Tables Measuring 4'- 6" X 2' X 6" with stand and adjustable hunder with one drawer measuring 3' X 4' X 6" with locking device.	60	5000	300000
2.	Stools 14" X 14" X 1'-9"	60	1500	90000
3.	Chest of drawers with 4/6 drawers measuring 3'X 4' with 6" height for each drawer for members of teaching faculty.	8	20000	160000
VII LIBRARY & READING ROOM				
1.	Steel Almirah For Books	15	1800	27000
2.	Index Cabinet	4	1000	4000
3.	Reading Table	4	1800	7200
4.	Steel Chairs	30	200	6000
5.	Table for Periodicals	5	1500	7500
6.	Plane Filing Cabinet	4	3500	14000
7.	Books			25000
8.	Slides, Film strips & Charts			6000
9.	One Typewriter & Misc. Equipement			6000

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
VIII PRINTING EQUIPMENT & TEACHING AIDS:				
1.	Printing Frame (Portable) and Ammonia Box.	2	1000	2000
2.	Tracing Table with Tubelight Fittings.	2	10000	20000
3.	Drawing Instruments Boxes	4	3000	12000
4.	Railway curves, Set squares Parallel, Ruler, French curves and other drawing equipment.	4	4000	16000
5.	Leory, U.N.O. graphs and other lettering sets and stencils.	4	4000	16000
6.	Slides and Medels, LCD Projector 2000 lumen, digital voice Recorder and audio-visual equipemt.	2 Set	200000	400000
7.	Photographic Equipment with all Necessary Printing Arrangements	4 set	50000	200000
8.	Ammonia Printing Continous Machines.	2	24000	48000
9.	Plotter latest A1 size coloured A1-A4, Resoulution 2400X1200 dpi, Memory standard 64 MB, Connectivity standard USB port & Ethernet Port	2	100000	200000
10.	Colour Printer A-3 Size Lase Jet	2	45000	90000
IX TOOLS AND EQUIPMENTS				
1.	Drawing Board (Imperial Size) With acrylic Parral bar(Imperial Size)	60	1200	72000
2.	Set Square 8" X 10" (45o,30o,60o)	20 Set	500	10000
3.	Drafters	5	1500	7500
4.	Rapidograph Complete Set with Compass (General Set).	4	5000	20000
5.	Stencil Set (Complete Letering)	10	500	10000
6.	Instrument Boxes	10	2000	20000
7.	Measuring Tape set of different length 3m,5m,50m,100m	5	2000	10000
8.	Engineering Scales, Triangular	5	3000	15000
9.	Fluroscent tubes with fittings for desplay window.	6	250	1500
10.	Drawing Templates	60	100	6000
11.	Other Miscellaneous Drawing Equipments			100000

XI SURVEYING LAB

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
1.	Transit Theodolites-Ordinary type with all accessories	8	15000	120000
2.	Transit Theodolites-Precision type with all accessories	4	20000	80000
2.A.	Digital Theodolite, Magnification 30X, Accuracy 2 Arc Second, Horizontal Range 360 Degrees, Horizontal Graduations 2 Second, Vertical Range 2 Second, Vertical Graduation 2 Second, 1.77 In Aperture, Field of View 1 Deg. 30 Min, Number of Lenses 8.	2	100000	200000
3.	Engineer's Level (Carl Zeiss Jena 030 or equivalent) with accessories	2	8000	16000
4.	Wye Level with accessories	2	5000	10000
5.	Dumpy Levels, Solid Type ordinary with accessories.	20	4800	80000
6.	Sopwith Levelling Staff, 3 M. Long Telescope Type.	20	1500	30000
7.	Plane Table With Accessories like Alidade, Through Compass etc.	20	1800	36000
8.	Plane Table With Telescopic Alidade, Trough Compass etc.	2	10000	20000
9.	Prismatic Compass 4" dia with tripod etc.	20	2000	40000
10.	Prismatic Compass - Pocket Size	4	350	1400
11.	Metallic tape, Chesterman Type 30 m. Long.	20	400	8000
12.	Metallic tape, Chesterman Type 15 m. Long.	20	250	1000
13.	Steel Tape, 30 m. Long	10	500	5000
14.	Steel Tape, 15 m. Long	10	300	3000
15.	Cross Staff Open Type with Brass Head.	20	150	3000
16.	Ranging Rod 8' high - Teak wood or Steel Pipe with iron shows painted etc.	60	250	15000

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
17.	Cross Staff Octagonal type brass head.	8	150	1200
18.	30 m. Chains	15	500	7500
19.	Optical Square	4	1000	4000
20.	Box Sextant	4	2000	8000
21.	Abney's Level With Vernier Micrometer Screw etc.	2	2500	5000
22.	Murrall's Hand Level	2	800	1600
23.	Indian Clinometer	2	1000	2000
24.	Pantagraph 1 m.	4	2500	10000
25.	Amsler Polar Plainmeter of of Sliding bar type.	8	2000	16000
26.	Magnifying glass with handle and Case.	8	200	1600
27.	Stop watch (with 100 divisions)	4	900	3600
28.	Spirit Levels	20	400	8000
29.	Surveying Field Work Umbrellas 1 m. diameter	12	500	6000
30.	Steel Arrows 30 cm. Long pointed at one end and hook at the other.	20	200	4000
31.	Surveying Magnetic Locators	30	5000	150000
32.	Direct Reading Laser Rods	10	22000	220000
33.	Direct Reading Optical Rods	10	25000	250000
34.	Distance Measuring Wheels	4	4500	18000
35.	G.P.S. Pole Transporters	4	25000	100000
36.	Surveying Equipment Batteries and Charger	2 Set	5000	10000
37.	Total Station Video Assisted Control with Vision Video Assisted Documentation, REcall EDM range, Angular accuracy upto .5", Targets without interface distance accuracy of 1.5 mm and distance upto 1500 mtr.	2	300000	600000
38.	Data Acquisition Sensor	1	60000	60000

NOTE:

In the institutions where Diploma Course In Civil Engineering/Civil Engineering Spl. In Rural Engg./Civil Engg. Spl. In Water Resource Management in running, these equipment need not to be procured.



XII MATERIALS FOR BUILDING MUSEUM

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
1.	Different types of bricks			1000
2.	Different types of building stones/ Marble/Granite/Kota Stone			10000
3.	Different types of sands			5000
4.	Different types of Paints and Distempers/Varnishes			20000
5.	Different types of wood			20000
6.	Different types of wood products			20000
7.	Different types of glass samples.			20000
8.	Different types of Fasteners and Adhesives.			10000
9.	Different types of sanitary wares/ Shower Panel/W.C.			50000
10.	Samples of plumbing fixtures to be installes as working prototypes.			50000
11.	Samples of Electric wires and conducting materials.			20000
12.	Samples of floors finishes and wall finishes.			20000
13.	Samples of different Roofing materials			10000
14.	Samples of false ceiling fixture and finishes.			20000
15.	Samples of thermal insulating materials.			10000
16.	Samples of Acoustics materials			20000
17.	Samples of Building hardware.			20000
18.	Models, Charts and other teaching aids.			50000
19.	Specialized material e.g. Bullet Proof Glass, Fire Fighting Equipments, Charts of Lifts & Elevators, Communication Equipments Intercom, Wireless, Telephone Building Automation Systems			200000
20.	Various Production Units with their products and their catalouges			20000

COMPUTER AIDED DESIGN LAB

Equipment

Computer	Systems for students	60	35000	2100000
	Systems for staff	1	35000	35000

Display

Other Digital/ Power/ Software/ Consumable

A. Configuration

CPU	Core i7/Higher
RAM	2 GB (Min)
Cache	2 MB
HDD	500 GB

DVD Writer 24 X

LCD Monitor 17" Keyboard Mouse with Mouse  
PAD, Speaker

B Display and hard copy devices

i Laser Printer A4	2	8000.00	16000.00
ii Ploters A0 size	1		200000.00
iii LCD Projector 2000 Lumen	1		75000.00
iv Screen (High Reflectance)	2	5000.00	10000.00

C. Others

i Colour Scanner with OCR Software (A4)	1 x		15000.00
ii UPS for supplying Power to laboratory 5 KVA	2	75000	150000.00
v AC 1.5 t	8	30000	240000.00
vi Computer tables 5 x 3 ft	60	5000	300000.00
vii Computer Chairs	60	1500	90000.00
viii Storage Rack	2	5000	10000.00
ix Vacuum Cleaner	1	12000	12000.00
x Printer Table	2	3000	6000.00

D. Software Auto CADD, Revit etc. 3D Max. 4,00000.00

i Window 98/2000			
ii Microsoft office or lotus smartsuite			
iii Autocad Release 2000			
iv 3D Home architect Photo shop with image ready (ADOBE)			

INTRODUCTION TO COMPUTER (Common to all Trades)

COMPUTER CENTRE

S.No.	DESCRIPTION	QTY.	APPROX. COST (in Rs.)
1.	Core-2 Quad Processor, 4GB RAM 1 GB SATA HDD, 19" TFT Monitor/ Server of Latest Specification OS-Windows 2007/2008/Latest Version	02 Server	1,20,000=00
2.	General Desktop Computer-Intel i5 60 node or Higher(with latest Specification Pre loaded latest Anti Virus with Life time Subscription, Licence Media and Manual with UPS 660 VA with latest window OS Including licence OR Computer of latest Specification With latest window os including licence		36,00,000=00
3.	Software :((Latest Version)		
	i. MS OFFICE 2010/Latest Version		LS LS
	ii. COMPILER 'C', C++, JAVA-7		LS LS
4.	Hardware		4,50,000.00 LS
	i. Switch-32 Port		02
	ii. Router		02
	iii. Hub		04(8 Port)
	iv. Ext. Modem		02
	v. Wireless N/W Adaptor		02
	vi. Series Access Point		02
	vii.LAN Cable Meter		05
	viii. LAN Cable Analyzer		05
	ix. Crimping Tool		15
	and all other accessories related to Networking		
5.	Scanner- Flat Bed A4/Auto Lighter (Bit depth 48)	02	20,000
6.	132 Column 600 CPS or faster 9 Pin dot matrix printer with 500 million character head life	02	50,000
7.	Laser Jet-A4 All In one 20 page per min (2 Each)	04	50,000
8.	Desk Jet-A4 Photo Smart (2 Each)	04	40,000
9.	5 KVA on line UPS with minimum 30 minute battery backup along with sealed maintenance free batteries. Provision for connecting external batteries with network connectivity.(For 2 Labs)	04	8,00000

10.	Split Air Conditioner 1.5 tones capacity with ISI mark along with electronic voltage stabilizer with over voltage and time delay circuit	08	35,0000
11.	Room preparation and furniture	LS	
12.	19" rack, 24-port switch. connector RJ-45 Cat-6 cabling for network	LS	10,0000
13.	2 KVA Inverter Cum UPS	02	6,0000
14.	Fire Extinguisher (2 Kg.)	04	15000
15.	Fire Extinguisher (5 Kg.)	04	25000
16.	Vacuum Cleaner	02	25000
17.	LCD Projector 3000 Lumen with all Accessories	02	350000
18.	Pen Drive 16 GB	10	10000
19.	DVD Writer External	02	10000
20.	HDD External 500 GB	02	15000
21.	PAD (Latest Configuration)	02	15000
22.	Broadband For Internet(Speed Min. 8mbps)	04	LS
23.	USB Modem	02	8000
24.	Generator 15 KVA Water Coolant	01	450000

7.	LEARNING RESOURCE MATERIALS			
1.	LCD Projector with Screen	1	--	20000
2.	Handicam	1	--	30000
3.	Cutting, Binding & Stitching equipment.	1	--	30000
4.	Desk Top Computer with Internet Core i5/i7- 760, Processor, Genuine Windiw 7, Professional 18 inch HD, Flat Panel Monitor Optical Mouse, Key Board & all related media or latest version	1	--	40000
5.	Home Theater Support Disc type CD. CDR/CDRW DVDR/DVDRW, VCD Supported with USB Port Support-DIVX/JPEG/MP3	1	--	25000
6.	Commerical P A System 16 W-220W output, AC & 24V DC Operated, 5 Mic. & 2 Auxilary input, Speaker output 4 Ohm, 8 Ohm, 17 V & 100 V	1	--	20000
7.	Interactive Board	1	--	50000

Note :

1. This center will be only one at the institute level irrespective of all branches.

## COMMUNITY DEVELOPMENT WORK

For Community Development work two 15 days camps shall be organised during the session in the identified villages. The students shall stay in the camps and under the supervision of the concerned faculty members shall undertake/execute the assigned works in the following fields.

1. To launch and sustain functional literacy programmes.
2. To train the rural youth in different trades/skills.
3. Training by innovating and improving the efficiency of household gadgets.
4. To control and reduce pollution affecting the social fabric of rural life i.e.
  - Construction of Soak Pits and Sanitary Latrines, Tree Plantation, Social Forestry, Installation of Smokeless Chulhas.
5. To disseminate information on sources of non conventional energy. Installation and maintenance of Solar Street Lights, Solar Photovoltaic Pumps, Wind Mills, Bio Gas Plants etc shall be undertaken.
6. Transfer of appropriate Technology/Demonstration of cheap houses by use of locally available material, treatment of mud walls innovation of mud floor, treatment of thatch roofs etc shall be taken with provisions for training to the villagers.
7. Training and demonstration of new agricultural implements, household gadgets and appliances of non conventional energy.
8. To help the rural youth in preparing project reports to set up industrial units and entrepreneurial development.
9. All community polytechnics shall render, repair and maintain agricultural implements, appliances of non conventional energy, household gadgets, etc. and train the rural youth in such skills.

INSTITUTE OF RESEARCH, DEVELOPMENT AND TRAINING, U.P., KANPUR -208024

SUBJECT: Questionnaire for ascertaining the job potential and activities of diploma holders in Architectural Assistantship

PURPOSE: To design and develop Three Year diploma curriculum for Architectural Assistantship.

NOTE: 1. Please answer the questions to the points given in the questionnaire.  
2. Any other point or suggestion not covered in this questionnaire may be written on a separate paper and enclosed with the questionnaire.

1. Name of the organisation: \_\_\_\_\_  
\_\_\_\_\_

2. Name & Designation of the officer \_\_\_\_\_  
filling the questionnaire \_\_\_\_\_

3. Name of the department/section/ \_\_\_\_\_  
shop \_\_\_\_\_

4. Important functions of the \_\_\_\_\_  
department/section/shop \_\_\_\_\_

5. Number of diploma holders employees \_\_\_\_\_  
under your charge in the area of \_\_\_\_\_  
Architectural Assistantship.

6. Please give names of modern equipment/machines handled by the diploma holders in Architectural Assistantship.

1.	2.	3.
4.	5.	6.

7. What proficiencies are expected from the diploma holders in Architectural Assistantship.

1.	2.	3.
4.	5.	6.

8. Mention the approximate percentage of the following desired in Diploma teaching.

1. Theoretical knowledge	-----%
2. Practical knowledge	-----%
3. Skill Development	-----%

9. Do you think " on the job training" / Industrial training should form a part of the curriculum. ( Yes/ No)

- if yes then  
 (a) Duration of training -----  
 (b) Mode of training 1. Spread over different semesters  
 2. After completion of course  
 3. Any other mode

10. What mode of recruitment is followed by your organisation.

1. Academic merit
2. Written test
3. Group discussion
4. Interview
5. On the job test.

11. Mention the capabilities/ Qualities looked for while recruiting diploma holder in Architectural Assistantship.

- (a) Technical knowledge -----
- (b) Practical skill -----
- (c) Etiquettes and behaviour -----
- (d) Aptitude -----
- (e) Health, habit and social background -----
- (f) Institution where trained -----

12. Does your organisation have any system for survey of important buildings/articles of different countries/states. Yes/No

13. Does your organisation conduct field survey to know users' views regarding: Yes/No

1. Planning, Designing and Interiors of buildings.
  2. Effect of climatic conditions
  3. Any other
- If yes, Please give brief account of each.

14. Which type of assignment do you suggest for an entrepreneur in Architectural Assistantship.

15. In which types of organisations can a diploma holder in Architectural Assistantship can work or serve.

- |   |   |   |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |

16. Job prospects for the diploma holders in Architectural Assistantship for the next ten years in the state / country.

17. In your opinion, what should be the subjects to be taught to a diploma student in Architectural Assistantship.

Theory	Practical
--------	-----------

18. Kindly mention particulars regarding topics/areas which should be given more emphasis in the curriculum.



- | Theory   | Practical |
|--|-----------|
| 19. Kindly state whether your organisation can contribute towards improvement of curriculum in the above field.<br>If yes, Please give names of the experts available in your organisation who may be contacted for the purpose. | Yes/ No   |
| 20. Kindly give your valuable suggestions for being considered at the time of finalisation of the curriculum.  |           |
| 21. What changes in technologies are to be incorporated in the development of curriculum in Architectural Assistantship.   |           |

( Signature )

Kindly mail the above questionnaire duly filled in to:-

Kalpana Devi  
Asstt. Professor  
Institute of Research, Development & Training, U.P.  
Govt. Polytechnic Campus  
Kanpur-208002

( Please note that all information in this survey is confidential for the use of curriculum design only )