CURRICULUM

FOR

DIPLOMA PROGRAMME

ARCHITECTURAL ASSISTANTSHIP

IN

1st Year(1st & 2nd Semester)

FOR THE STATE OF HIMACHAL PRADESH

Implemented w.e.f. Session 2012-13

***Prepared by*:-**

Composite Curriculum Development Centre
Directorate of Technical Education,
Vocational & Industrial Training, Sundernagar(H.P.)

July, 2012

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PREFACE

India, in last two decades, has made significant progress in all major spheres of activity. Since 1947, the Technical Education System has grown into fairly large sized system, offering opportunities for education and training in vide variety of trades / disciplines at different levels. Needless to say that well trained technical manpower is the backbone of any growing economy in the era of fast industrialization. It has been the endeavor of the Technical Education Department to take decisive steps to enhance the capacities of technical institutions with major emphasis on quality and excellence in technical education .Our country is the only country in the world which has 50% population below the age of 25 years whereas America has 30% and China 40%.Working Age Population (WAP) is increasing in India whereas it is decreasing in other parts in the world. Challenge before us is to train this WAP for the world of work .Updated curriculum is one of the most powerful tools to improve the quality of training.

Curriculum Document is a comprehensive plan or a blue print for developing various curriculum materials and implementing given educational programme to achieve desired and formally pre-stated educational objectives. Moreover it (the document) is the output of exhaustive process of curriculum planning and design, undertaken by the implementers under the expert guidance of curriculum designer.

While working out the detailed contents and study and evaluation scheme, the following important elements have been kept in mind:

i) Major employment opportunities of the diploma holders.
ii) Modified competency profile of the diploma holders with a view to meet the changing needs due to technological advancement and requirements of various employment sectors.
iii) Vertical and horizontal mobility of diploma pass outs for their professional growth.
iv) Pragmatic approach in implementing all the curricula of diploma programmes in engineering and technology in the state of H.P.

The document is an outcome of the feedback received from field organizations/ industry of different categories viz. small, medium and large scale which offer wage employment for the diploma pass outs. In every stage of planning and designing of this curriculum, suggestions and advice of experts representing industry, institutions of higher learning, research organizations etc. were sought and incorporated as per the requirement of curriculum . The document contains the study and evaluation scheme and detailed subject/course contents to enable the H.P. Polytechnics to implement revised curriculum and to achieve the desired objectives.

Time has specifically been allocated for undertaking extra-curricular activities. Emphasis has been laid on developing and improving communication skills in the students for which Communication Lab has been introduced during the first year itself.

We hope that this revision will prove useful in producing competent diploma holders in the state of Himachal Pradesh. The success of this curriculum depends upon its effective implementation and it is expected that the managers of polytechnic education system in Himachal Pradesh will make efforts to create better facilities, develop linkages with the world of work and foster conducive and requisite learning environment.

Er. L.R. Rana
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Directorate of Technical Education,
Vocational & Industrial Training,
Sundernagar, Himachal Pradesh.

1st YEAR OF THREE YEAR DIPLOMA PROGRAMME IN ARCHITECTURAL ASSISTANTSHIP DISCIPLINE

SALIENT FEATURES

1)	Name of the Programme	:	Three year Diploma Programme (Architectural Assistantship Stream)
2)	Duration of the Programme	:	Three years (06 Semesters)
3)	Entry Qualification	:	As prescribed by H.P. Takniki Shiksha Board
4)	Intake	:	As approved by H.P. Takniki Shiksha Board
5)	Pattern of the Programme	:	Semester Pattern
6)	Curriculum for	:	1st year of Three year Diploma Programme

7) **Student Centred Activities:**

A provision of 2-4 hrs per week has been made for organizing Student Centred Activities for overall personality development of students. These activities will comprise of co-curricular & other activities such as expert lectures, games, seminars, declamation contests, educational field visits, NCC, NSS and cultural activities & hobby classes like photography, painting, singing etc.

2. GUIDELINES

2.1 GUIDELINES FOR ASSESSMENT OF STUDENT CENTRED ACTIVITIES (SCA)

Distribution of 25 marks for SCA will be as follows:

i. 5 Marks shall be given for general behaviour

ii. 5 Marks for attendance shall be based on the following distribution:

1.	Less than 75%	Nil
2.	75-79.9%	3 Marks
3.	80-84.9%	4 Marks
4.	Above 85%	5 Marks

iii. 15 Marks shall be given for the Sports/NCC/Cultural and Co-curricular activities/other activities after due consideration to the following points:

1. For participation in sports/NCC/Cultural/Co-curricular activities at National or above level, shall be rewarded with minimum of 10 marks
2. For participation in sports/NCC/Cultural/Co-curricular activities at Inter-polytechnic level, shall be rewarded with minimum of 08 marks
3. For participation in two or more of the listed activities, 5 extra marks should be rewarded

Note: *Head of Department Applied Science shall ensure that these marks are conveyed to the H.P. Takniki Shiksha Board, Dharamsala at the end of semester along with sessional record.*

2.2 GUIDELINES FOR INTERNAL ASSESSMENT

- The distribution of marks for Internal Assessment in theory subjects and drawing shall be made as per the following guidelines:

i. 60% of internal assessment shall be based on the performance in the tests. At least three tests shall be conducted during the semester out of which at least one should be house test. 30% weightage shall be given to house test and 30% to class test(One best out of two).

ii. 20% marks shall be given to home assignments, class assignments, seminars etc.

iii. 20% marks shall be given for attendance/punctuality in the subject concerned.

- The distribution of marks for Internal Assessment in practical subjects shall be made as per the following guidelines:

i. 60% marks shall be awarded for performance in practical.

ii. 20% marks shall be given for Report/Practical book and punctuality in equal proportion.

iii. 20% marks shall be for Viva-voce conducted during the practicals.

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

FIRST SEMESTER

SR. NO	SUBJECTS	STUDY SCHEME **Hrs/Week**		MARKS IN EVALUATION SCHEME								**Total Marks**
				INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		Th	**Pr**	**Th**	**Pr**	**Total**	**Th**	**Hrs**	**Pr**	**Hrs**	**Total**	
1.1	*English and Communication Skills – I	3	2	30	20	**50**	100	3	50	3	**150**	**200**
1.2	*Applied Mathematics – I	5	-	50	-	**50**	100	3	-	-	**100**	**150**
1.3	Applied Sciences	4	-	50	-	**50**	100	3	-	-	**100**	**150**
1.4	Sketching Lettering & Printing	2	6	-	50	**50**	-	-	100	4	**100**	**150**
1.5	Graphics Presentation-I	-	8	-	100	**100**	-	-	100	4	**100**	**200**
1.6	Building Material-I	3	-	50	-	**50**	100	3	-	-	**100**	**150**
1.7	Workshop Practice	-	4	-	100	**100**	-	-	50	3	**50**	**150**
#Student Centred Activities		-	3	-	25	**25**	-	-	-	-	**-**	**25**
Total		**17**	**23**	**180**	**295**	**475**	**400**		**300**		**700**	**1175**

* Common with other diploma programmes

\# These activities will comprise of co-curricular & other activities such as expert lectures, games, seminars, declamation contests, educational field visits, NCC, NSS and cultural activities & hobby classes like photography, painting, singing etc.

SECOND SEMESTER

SR. NO.	SUBJECTS	STUDY SCHEME Hrs/Week		MARKS IN EVALUATION SCHEME								Total Marks
				INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		Th	Pr	Th	Pr	**Total**	Th	Hrs	Pr	Hrs	**Total**	
2.1	*English and Communication Skills - II	3	2	30	20	**50**	100	3	50	3	**150**	**200**
2.2	* Applied Mathematics – II	5	-	50	-	**50**	100	3	-	-	**100**	**150**
2.3	Graphics Presentation-II	-	6	-	50	**50**	-	-	100	4	**100**	**150**
2.4	Building Material-II	3	-	50	-	**50**	100	3	-	-	**100**	**150**
2.5	Building Construction-I	2	6	20	30	**50**	100	4	50	3	**150**	**200**
2.6	Theory of Design	3	-	50	-	**50**	100	3	-	-	**100**	**150**
2.7	Architectural Design-I	2	6	-	100	**100**	100	4	50	4	**150**	**250**
#Student Centred Activities		-	2	-	25	**25**	-	-	-	-	**-**	**25**
Total		**18**	**22**	**200**	**225**	**425**	**600**	**21**	**250**	**14**	**850**	**1275**

* Common with other diploma programmes

\# These activities will comprise of co-curricular & other activities such as expert lectures, games, seminars, declamation contests, educational field visits, NCC, NSS and cultural activities & hobby classes like photography, painting, singing etc.

2. *DETAILED CONTENTS*
OF
ARCHITECTURAL ASSISTANTSHIP
SUBJECTS

1.1 ENGLISH AND COMMUNICATION SKILLS – I

L	T	P
3	-	2

RATIONALE

Language is the most commonly used medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this course is to enable the diploma holders to acquire proficiency, both in spoken (oral) and written language. At the end of the course, the student will be able to develop comprehension skills, improve vocabulary, use proper grammar, acquire writing skills, correspond with others and enhance skills in spoken English. It is expected that each polytechnic will establish a ***communication skill laboratory*** *for conducting practical's mentioned in the curriculum.*

DETAILED CONTENTS

1. **Facets of Literature** (14 hrs)
   - 1.1 Short Stories
     - 1.1.1 Homecoming – R.N. Tagore
     - 1.1.2 The Diamond Necklace- Guy- De Maupassantt
   - 1.2 Prose
     - 1.2.1 I Have A Dream – Martin Luther King
     - 1.2.2 On Habits – A. G. Gardiner
   - 1.3 Poems
     - 1.3.1 Ozymandias – P.B. Shelley
     - 1.3.2 Daffodils – William Wordsworth
     - 1.3.3 Stopping by Woods on a Snowy Evening – Robert Frost

2. **Grammar and Usage** (10 hrs)
   - **2.1 Parts of speech**
     - 2.1.1 Nouns
     - 2.1.2 Pronouns
     - 2.1.3 Adjectives
     - 2.1.4 Articles
     - 2.1.5 Verbs
     - 2.1.6 Adverbs
     - 2.1.7 Prepositions
     - 2.1.8 Conjunction
     - 2.1.9 Interjection
     - 2.1.10 Identifying parts of speech
   - 2.2 **Pair of words (Words commonly confused and misused)**
     - 2.1 Tenses
     - 2.2 Correction of incorrect sentences
     - 2.3 One word Substitution

3. **Translation** (04 hrs)
   - 3.1 Glossary of Administrative Terms (English and Hindi)
   - 3.2 Translation from Hindi into English and English to Hindi.

4. **Paragraph of 100-150 words from outlines** (08 hrs)

5. **Comprehension** (04 hrs)

Unseen passages of literacy, scientific, data/graph based for comprehension exercises

6. **Communication** (08 hrs)

6.1 Definition, elements and Process of Communication

6.2 Objectives of Communication

LIST OF PRACTICALS

1. Locating a Book in Library
2. How to look up words in a Dictionary: meaning and pronunciation of words as given in the standard dictionary using symbols of phonetics,
3. How to Seek Information from an Encyclopedia
4. Listening pre-recorded English language learning programme
5. Paper Reading before an audience (reading unseen passages)
6. Study of spelling Rules
7. Study of essentials of a Good Speech to respond and comprehend visual, oral themes, situations or stimulus and practice before select gathering
8. Exercises on use of different abbreviations
9. Greetings for different occasions
10. Introducing oneself, others and leave taking
11. Exercises on writing sentences on a topic

Note:

1. *The Text Book on "English and Communication Skills, Book-I By Kuldip Jaidka et. al. developed by NITTTR, Chandigarh is recommended to be used for teaching and setting-up the question papers.*
2. *A communication laboratory may be set up consisting of appropriate audio-video system with facility of playing CDs/DVDs and a video camera for recording the performance of each student with play back facility. A set of CDs from any language training organization e.g. British Council etc. may be procured for use of students.*
3. *Elements of body language will be incorporated in all practicals*
4. *The practical exercises involving writing may also be included in Theory Examination.*

RECOMMENDED BOOKS

1. *English and Communication Skills, Book-I By Kuldip Jaidka, Alwainder Dhillon and Parmod Kumar Singla, Prescribed by NITTTR, Chandigarh Published By Abhishek Publication, 57-59, Sector-17, Chandigarh*
2. *Essentials of Business Communication by Pal and Rorualling; Sultan Chand and Sons*
3. *The Essence of Effective Communication, Ludlow and Panthon; Prentice Hall of India*
4. *New Design English Grammar, Reading and Writing Skills by AL Kohli (Course A and course B), Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,*
5. *New Design English Reading and Advanced Writing Skills for Class XI and XII by MK Kohli and AL Kohli; Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,*
6. *A Practical English Grammar by Thomson and Marlinet*
7. *Spoken English by V Sasikumar and PV Dhamija; Tata McGraw Hill*
8. *English Conversation Practice by Grount Taylor; Tata McGraw Hill*
9. *Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi*

10. *Business Correspondence and Report Writing by RC Sharma and Krishna Mohan; Tata McGraw Hill Publishing Company Ltd. New Delhi*
11. *Communication Skills by Ms R Datta Roy and KK Dhir; Vishal Publication, Jalandhar*

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	14	40
2	10	15
3	4	10
4	8	10
5	4	10
6	8	15
Total	**48**	**100**

Glossary of Administrative Terms

1.	Senior	वरिष्ठ
2.	Cashier	खजांची
3.	Consent	सहमती
4.	Earned Leave	जमा छुट्टी
5.	Under Consideration	विचार अधीन
6.	Criterion	कसौटी
7.	Staff	कर्मचारी
8.	Tenure	कार्यकाल
9.	Working Committee	कार्य समिति
10.	Estate	संम्पदा
11.	Self-Sufficient	आत्मनिर्भर
12.	Emergency	आपात्तकाल
13.	General Body	आम सभा
14.	Exemption	छूट
15.	Daily wages	दिहाडीदार
16.	Death-Cum Retirement	मृत्यु और निवरती
17.	Despatch Register	रवानगी रजिस्टर
18.	Despatch	रवानगी
19.	Stenography	आशुलिपिक
20.	Assurance	दिलासा
21.	Justify	सही साबित करना
22.	Superior	बढिया
23.	High Commission	उच्चायुक्त
24.	Simultaneous	साथ - साथ
25.	Precautionary	एहतिहाती
26.	Commanding Office	कमांडिग अफसर
27.	Negligence	लापरवाही
28.	Performance	पुरा करना
29.	Proof Reader	प्रुफ रीड़र
30.	Take Over	काम सभालना
31.	Timely Compliance	समय दौरान पुरा करना
32.	Responsibility	जिमेदारी
33.	Chief Justice	मुख्य न्यायधिश
34.	Disciplinary Action	अनुशासनिक कारवाई
35.	Efficiency Bar	दक्षता रोक
36.	Flying Squad	उड़न दस्ता
37.	Regret	खेद
38.	Inconvenience	असुविधा
39.	Ambiguous	अस्पष्ट
40.	Part Time	अशंकालीन
41.	Academy	अकादमी
42.	Disparity	असमानता
43.	Extraordinary	असाधारण
44.	Provisional	अस्थायी
45.	Income Tax	आयकर
46.	Bonafide	असली
47.	Acting in Official Capacity	बतौर अधिकारिक हैसियत
48.	Contractor	ठेकेदार
49.	On probation	परिवीक्षाधीन
50.	State	राज्य

51.	Administrator	प्रशासक
52.	Admission	प्रवेश
53.	Aforesaid	पूर्वोक्त, उपरोक्त
54.	Affidavit	शपथपत्र
55.	Agenda	कार्यसूची
56.	Alma Mater	विद्यालय जहां किसी व्यक्ति ने शिक्षा प्राप्त
57.	Appointing Authority	मनोनित अधिकारी
58.	Apprentice	शिल्पकारू
59.	Additional	अतिरिक्त
60.	Advertisement	विज्ञापन
61.	Assistant	सहायक
62.	Assumption of Charge	अधिकार ग्रहण करना
63.	Attested Copy	सत्यापित प्रति
64.	Chief Minister	मुख्यमन्त्री
65.	Clerical Error	लेखन सम्बन्धी भ्रम
66.	Code	कानून की किताब, गुप्त भाषा
67.	Corruption	नैतिक भ्रष्टाचार, खोटापन
68.	Craftsman	कारीगर
69.	Compensation	हरजाना
70.	Compensatory Allowance	क्षतिपूरक भत्ता
71.	Compile	संकलन करना, संग्रह करना
72.	Confidential Letter	गुप्त पत्र
73.	Chief Engineer	मुख्य अभिन्यता
74.	Data	स्वीकृत तत्तव (आंकड़े)
75.	Dearness Allowance	मंहगाई भत्ता
76.	Department	विभाग
77.	Dictionary	शब्द कोष
78.	Director	निंदेशक, संचालन
79.	Director of Tech. Edu.	तकनीकी शिक्षा निंदेशक
80.	Executive Engineer	अधिशासी अभियन्यता
81.	Employment Exchange	व्यवसाय केन्द्र
82.	Head Office	मुख्य कार्यालय
83.	Head Clerk	प्रधान लिपिक
84.	Indian Admn. Service	भारतीय प्रशासनिक सेवा
85.	Legislative Assembly	विधान सभा
86.	Officiating	स्थानापन्न
87.	Office Record	कार्यालय रिकार्ड
88.	Office Discipline	कार्यालय अनुशासन
89.	Polytechnic	बहुतकनीकी
90.	Temporary	अस्थायी
91.	Qualified	योग्यता प्राप्त
92.	Under Investigation	जांच अधीन
93.	Sub-treasury	उप-खजाना
94.	Target Date	लक्ष्य तिथि
95.	Technical Approval	तकनीकी मान्यता
96.	Verification	जांच पड़ताल
97.	Viva-voca	मौखिक परीक्षा
98.	Write off	बटटेखाते डालना
99.	Warning	चेतावनी
100.	Yours faithfully	भवदीय

1.2 APPLIED MATHEMATICS - I

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1 RATIONALE

Applied Mathematics forms the backbone of engineering students. Basic elements of algebra, trigonometry, coordinate geometry have been included in the curriculum as foundation course. This course will develop analytical abilities to make exact calculations and will provide continuing educational base to the students.

DETAILED CONTENTS

1. **Algebra** (25 hrs)

1.1 Complex Numbers: Definition, real and imaginary parts of a Complex number, polar and Cartesian, representation of a complex number and its conversion from one form to other, conjugate of a complex number, modulus and amplitude of a complex number Addition, Subtraction, Multiplication and Division of a complex number. De-movier's theorem, its application.

1.2 Partial fractions (linear factors, repeated linear factors

1.3 Permutations and Combinations: Value of ${}^{n}p_{r}$ ${}^{n}c_{r}$. Simple problems

1.4 Binomial theorem (without proof) for positive integral index (expansion and general form); binomial theorem for any index (expansion without proof) first and second binomial approximation with applications to engineering problems

2. **Trigonometry** (25 hrs)

2.1 Concept of angles, measurement of angles in degrees, grades and radians and their conversions.

2.2 T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T-Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2).

2.3 Graphs of

$\sin x, \cos x, \tan x$ and e^{x}

3. **Differential Calculus** (30 hrs)

3.1 Definition of function; Concept of limits.
Four standard limits

$$\lim_{x\to a}\frac{x^n-a^n}{x-a},\ \lim_{x\to 0}\frac{\sin x}{x},$$

$$\lim_{x\to 0}\left(\frac{a^x-1}{x}\right),\ \lim_{x\to 0}(1+x)^{1/x},$$

3.2 Differentiation by definition of $x^n, \sin x, \cos x, \tan x, e^x, \log_a x$

3.3 Differentiation of sum, product and quotient of functions. Differentiation of function of a function.

3.4 Differentiation of trigonometric inverse functions. Logarithmic differentiation. Exponential differentiation Successive differentiation (excluding nth order).

3.5 Applications:
(a) Maxima and minima
(b) Equation of tangent and normal to a curve (for explicit functions only)

RECOMMENDED BOOKS

1. *Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi*
2. *Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar*
3. *Applied Mathematics by Dr. RD Sharma*
4. ***Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain, Eagle Parkashan, Jalandhar***
5. *Comprehensive Mathematics, Vol. I & II by Laxmi Publications*
6. *Engineering Mathematics by Dass Gupta*
7. *Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi*
8. *Comprehensive Mathematics, Vol. I & II by Laxmi Publications*
9. *Engineering Mathematics, Vol I, II & III by V Sundaram et al, Vikas Publishing House (P) Ltd., New Delhi*
10. *Engineering Mathematics by N.Ch.S.N Iyengar et.al, Vikas Publishing House (P) Ltd., New Delhi*
11. *Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,*
12. *Engineering Mathematics, Vol I & II by AK Gupta, MacMillan India Ltd., New Delhi*
13. *Applied Mathematics Vol-1 & II by Hiteshi Publication.*

SUGGESTIVE DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	25	30
2	25	30
3	30	40
Total	**80**	**100**

1.3 APPLIED SCIENCES

L T P
4 - -

RATIONALE

Applied Sciences are very essential to develop scientific temper, continued learning skills and appreciation of physical and chemical changes of concern in the field of Architecture. This course covers elements of Applied Physics and Applied Chemistry and Applied Physics contains: units of measurements, force and motion, temperature and its measurement, Acoustics of buildings and fundamentals of light. Applied Chemistry part covers: metals, corrosion and its prevention, plastics, refractory and paints and varnishes.

Teachers while imparting instructions are expected to demonstrate various physical and chemical processes to clarify the concepts and principles involved in the course.

DETAILED CONTENTS

Part A - Physics:

1. Units of measurement in SI system. Dimensions and dimensional formula of physical quantities, principle of Homogeneity. (4hrs)
2. - Force and motion
   - Conservation of momentum; work and energy, power
   - Forms of energy and conservation of energy; stress, strain, Hooke's law. (4hrs)
3. Spring mass system. Vibration of bodies; amplitude, frequency and Time period of vibrations; free, forced and resonant vibrations, vibration of structural members. (6hrs)
4. Temperature and its measurement, Mercury thermometer, Bimetallic thermometer, Scales of thermometer. Practical application off thermal expansion. (6hrs)
5. Expansion of solids, Linear, Superficial and cubical expansions, thermal equilibrium; laws of thermodynamics. (5hrs)
6. Acoustics of buildings and simple calculation of reverberation times; principles of acoustic modeling, sources of sound. (5hrs)
7. Light as waves, solar energy, solar cells and green house effects; visible spectrum , source of light; light efficiencies; luminous intensity, electromagnetic waves(Infrared & Ultra Violet). (5hrs)
8. Electrical nature of matter; conductor semiconductor and insulator, molecular forces - cohesive and adhesive forces;. (5hrs)

Part B - Applied Chemistry

1. Raw materials and admixtures used in the manufacture of copper, aluminium, iron and steel. Manufacturing processes to be dealt in brief with flow diagrams. (4hrs)
2. Properties and uses of copper, aluminium, iron and steel. Corrosion: Meaning of corrosion, Electrochemical theory of corrosion, prevention of corrosion by various methods. (4hrs)
3. Plastics: Review of saturated and unsaturated hydrocarbons (Methane, ethane, Ethylene, Acetylene and Vinyl chloride etc) Condensation and polymerization. Thermosetting and thermo plastics. However, emphasis should be given to name of common varieties of plastics and their uses. Deninition and uses of fibers and elastomers (Natural and synthetic rubber). (8hrs)
4. Refractories: Meaning of refractory material: General methods of manufacture of:
   a) Acid refractories
   b) Basic refractories

   (4hrs)
5. Paints and varnishes: Drying oil, pigment, drier, thinner. (4hrs)

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
Part-A		
1	4	6
2	4	6
3	6	8
4	6	8
5	5	8
6	5	8
7	5	8
8	5	8
PART-B		
1	4	8
2	4	8
3	8	8
4	4	8
5	4	8
Total	**64**	**100**

1.4 SKETCHING, LETTERING AND PRINTING

L	T	P
2	-	6

RATIONALE

Free hand sketching, colouring and rendering, line sketching, shades and shadows, lettering and printing forms important components of Architecture discipline. This course aims at imparting desired skills in the above areas. Teachers are expected to lay considerable emphasis on practical work so that students attain sufficient skills in sketching, lettering and printing.

DETAILED CONTENTS

Following detailed exercises are recommended for this course:

1. **Free Hand Sketching Exercises:** (20hrs)
   - 1.1 Free hand sketching of simple geometrical surface (2 sheets)
   - 1.2 Free hand drawing of three dimensional geometrical objects (6 sheets: Cube, Cone, Prism, Pyramid, Cylinder, Sphere)
   - 1.3 Free hand drawing of a set of objects (2 sheets)
   - 1.4 Free hand sketching of simple buildings and landscaping (3 sheets)
   - 1.5 Free hand sketching of monuments, buildings and trees in different techniques and mediums (Pencil, pen ink, charcoal, coloured-inks, colours and crayous)

2. **Colouring and Rendering Exercises**: (30hrs)
   - 2.1 Definition and perception of colour and colour materials
   - 2.2 Hue values and intensity, value scale, intensity scale and colour circle (2 sheets)
   - 2.3 Study of colours; Emotional effects of colours, warm and cool colours, receding and advancing colours; effect of light on colours, colour harmonies and contrasts
   - 2.4 Colour in nature, art and architecture
   - 2.5 Shades and shadows, indication of surroundings, sky, clouds, trees, human figures in pencil, ink, colour and crayous (4 sheets)

3. **Preparation of Forms and Ability to Think in the Round**: (15hrs)
   - 3.1 Simple exercises on murals (2 sheets)
   - 3.2 Mural design Exercises

4. **Lettering Practice**: (35hrs)
   - 4.1 Ratio between height and width of letters and numerals, capitals and small(7:4 and 5:40) (2 sheets).
   - 4.2 Roman lettering, Gothic and Italics (3 sheets)
   - 4.3 Free hand lettering (1 sheet)
   - 4.4 Single line lettering (1 sheet)
   - 4.5 Broad pen lettering (1 sheet)
   - 4.6 Stylized lettering (1 sheet)
   - 4.7 Spacing
   - 4.8 Lettering with the help of Stencils (1 sheet)

5. **Printing Practice:** **(**28hrs**)**

5.1 Tracing of a simple building drawing made
   a) In Pencil (1 sheet)
   b) In Ink (1 sheet)

5.2 Preparations of Blue Prints of tracing drawings prepared for the purpose(2 sheets/2 Prints).

5.3 Folding of the Blue Print to a standard file size. (Refer Fig. 5 Page 37 ISI Code No. IS: 962-1967)

NOTE: *At least one drawing sheet of lettering should be prepared in Hindi/Punjabi.*

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	20	20
2	30	20
3	15	10
4	35	30
5	28	20
Total	**128**	**100**

1.5 GRAPHIC PRESENTATION-I

L T
- 8

RATIONALE

Graphic presentation forms a core subject for preparing perspective drawings, scale drawings, three dimensional views, furniture drawings and layouts. Therefore, this course aims at equipping the students with the skills of graphic presentation.

Teachers are expected to lay considerable stress on practical work so that student attain desired competencies for preparing good quality perspectives of interior and exterior of buildings in different media. Teachers are also expected to stress upon appropriate line work, properties, dimensioning, lettering, printing, colour rendering techniques, shades/shadows and sciography.

DETAILED CONTENTS

Chapter 1. **Introduction**: Marks=15 (24hrs)

1.1 Importance of Engineering Drawing
1.2 Definition of Plane Geometry, Solid Geometry
1.3 List of Drawing Instruments, Uses
1.4 Layout of Drawing Seats
1.5 Line, Lettering, Dimensioning

Chapter 2. **Plane Geometry**: (48hrs)

2.1 **Geometrical Construction**:- Marks=10

- 2.1.1 Geometrical Terms
- 2.1.2 Bisecting a Line, Arc and Angle
- 2.1.3 Diving a straight line-circumference
- 2.1.4 Construction of pentagon, Hexagon, Octagon, circular etc and calculation of its areas.

2.2 **Scales**:-

- 2.2.1 Representative fraction
- 2.2.2. Types of Scales
- 2.2.3 Plane Scale and Diagonal Scale

2.3 **Conic Section:-** Marks=25

- 2.3.1 Terminology- Ellipse, Parabola-Hyperbola, Rectangular Hyperbola-Construction

Chapter 3. **Solid Geometry** (56hrs)

- 3.3.1 Ortho Graphics Projections
- 3.3.1.1 Theory of Projection, Orthographic Projection, V.P. and H.P. Front and Top View
- 3.3.1.2 IST and Third Angle Projection Marks=15
- 3.3.2 Projection of point, Line and Planes Marks=10
- 3.3.3 Projection of Solids
- 3.3.4. Section of Solids
- 3.3.5 Development of Surfaces Marks=25

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	24	15
2	48	35
3	56	50
Total	**128**	**100**

1.6 BUILDING MATERIALS -I

L T P
3 - -

RATIONALE

Diploma holders in Architectural Assistantship are supposed to prepare working drawings of buildings. Knowledge of building materials is very essential from the point of construction materials as well providing detailed specifications in the detailed drawings. Therefore, the course in building materials includes imparting basic knowledge in the properties and use of the important materials like; stones, bricks, lime, cement, paints, timber, exterior and interior finishes, glass, plastics, building hardware, roofing materials, additives and admixtures, adhesives etc.

Teachers are expected to demonstrate the samples of different materials, discuss their properties with particular reference to their use and appearance in particular situations depending upon climate and environmental conditions of the site where the materials are to be used. Students should be encouraged to collect samples of various materials and efforts should be made to maintain a good building material museum.

DETAILED CONTENTS

1. **Building Stones:**
   - 1.1 Utility of stones
   - 1.2 Classification of rocks
   - 1.3 Selection of stones for different building works
   - 1.4 Characteristics of good building stones
   - 1.5 Testing of stones
     - 1.5.1 Water absorption test
     - 1.5.2 Compressive strength test
     - 1.5.3 Durability test
   - 1.6 Natural bed of stones
   - 1.7 Common building stones
     - 1.7.1 Granite, Basalt and Trap, Sandstone, Lime-stone, Slate, Marble
     - 1.7.2 Composition, properties, uses and localities (6 Hrs)

2. **Bricks:**
   - 2.1 Classification of bricks
     - 2.1.1 Properties and uses of First Class, Second Class, Third Class and Over burnt bricks
   - 2.2 Characteristics of good brick
   - 2.3 Size and weight of a standard brick
   - 2.4 Composition of brick earth
   - 2.5 Test for burnt clay bricks
     - 2.5.1 Compressive strength test, water absorption test and Efflorescence Test
   - 2.6 Fire bricks, its properties, uses and availability (4 Hrs)

3. **Lime**:
   - Uses of lime, classification of lime
   - Setting action of fat lime and hydraulic lime
   - Field testing of lime
   - Visual examination
   - Storing of lime
   - Artificial hydraulic lime
   - 3.7 Important technical terms (4 Hrs)

4. **Cement:**
   - 4.1 Uses of cement
   - 4.2 Composition of Portland cement
   - 4.3 Setting and hardening of cement
   - 4.4 Types of cement, their properties and uses

4.4.1 Ordinary Portland Cement (OPC)
4.4.2 Rapid Hardening Cement
4.4.3 High Alumina Cement
4.4.4 White Cement
4.4.5 Coloured Cement
4.4.6 Pozzolana Portland Cement
4.4.7 Sulphate Resisting Cement

4.5 Storage of Cement (6 Hrs)

5. **Mortar:**

5.1 Function of mortar
5.2 Preparation of cement mortar, lime mortar, lime cement mortar and their uses
5.3 Proportion of mortar for different building works
5.4 Different types of sand
5.5 Bulking of Sand (6 Hrs)

6. **Concrete**:

6.1 Mixing, placing and uses of lime concrete and cement concrete, aggregate and its grading
6.2 Placing of concrete
6.3 Compaction of concrete
6.4 Curing of concrete
6.5 Reinforced cement concrete (RCC)
6.5.1 Necessity of providing reinforcement
6.5.2 Properties of RCC (6 Hrs)

7. **Timber:**

7.1 Characteristics and uses of common Indian timbers i.e. Sal, Deodar, Kail, Chir, Teak etc.
7.2 Characteristics of hard wood and soft wood
7.3 Defects in timber
7.4 Characteristics of good timber
7.5 Different methods of seasoning of timber (6 Hrs)

8. **Paints:**

8.1 Water based paints
8.2 Dry distemper
8.3 Oil emulsion
8.4 Cement paints
8.5 Plastic emulsions
8.6 Oil paints
8.7 Varnishes
8.8 Enamel
8.9 Lacquers
8.10 Stucco
8.11 Tar and Bitumen Paint

Their covering capacity, trade names, uses and availability. (6 Hrs)

9. **Paints:**

Commercial Survey (For all the items 1 to 8)
Tentative Cost
Area Coverage
Comparative of the Material on the basis of
- Quality and Cost
- Suitability to requirement (4 Hrs)

**** Market Survey should be carried out on holiday and after college hours.***

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	6	20
2	4	10
3	4	10
4	6	10
5	6	10
6	6	10
7	6	10
8	6	10
9	4	10
Total	**48**	**100**

1.7 GENERAL WORKSHOP PRACTICE

L T P
- - 4

RATIONALE

This course aims at developing basic manual skills in carpentry, painting, polishing and masonry for creating necessary appreciation of the technology involved. Manual and machining skills of carpentry will also be helpful in making scaled models of buildings by using different materials. Hence this course.

DETAILED CONTENTS

A. Carpentry Shop: (18 Hrs)

1. Introduction to carpentry tools, machines and their application
2. Marking and sawing practice by using hand saw
3. Planning practice by using hand tools and wood planer
4. Chiseling practice by using hand tools
5. Exercises in preparation of joints i.e. lap joint, mortise and Tennon joint, Dovetail and glued joint
6. Exercises in development and preparation of simple models

B. Painting and Polishing Shop: (18 Hrs)

1. Exercises in preparation of surfaces before painting
2. Exercises in application of primer coat
3. Exercises in polishing wood items
4. Exercises in painting wooden and steel items

C. Masonry: (18 Hrs)

1. Exercise on handling of bricks, cement, sand and aggregate
2. Exercise on preparation of mortar
3. Exercise on laying of bricks in various bonds
4. Exercise on pointing and finishing.
5. Knowledge of various tools used by carpenter mason etc.

D. Welding: (10Hrs)

1. Introduction,
2. Welding Materials
3. Types of welding
4. Scope of Welding.
5. Exercises on welding

Note:- *3 Period to be taken at Mechanical workshop and 1 period to be taken in building construction lab.*

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	18	25
2	18	25
3	18	30
4	10	20
Total	**64**	**100**

2.1 ENGLISH AND COMMUNICATION SKILLS - II

L	T	P
3	-	2

RATIONALE

Language is the most commonly used medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this course is to enable the diploma holders to acquire proficiency, both in spoken (oral) and written language. At the end of the course, the student will be able to develop comprehension skills, improve vocabulary, use proper grammar, acquire writing skills, correspond with others and enhance skills in spoken English. It is expected that each polytechnic will establish a ***communication skill laboratory*** *for conducting practicals mentioned in the curriculum.*

DETAILED CONTENTS

1. **Facets of Literature** (14 hrs)
   - 1.1 Short stories
     - 1.1.1 The Portrait of a Lady - Khushwant Singh
     - 1.1.2 The Refugees – Pearl S. Buck
   - 1.2 Prose
     - 1.2.1 Forgetting- Robert Lynd.
     - 1.2.2 Walking Tours- Robert Louis Stevenson
   - 1.3 Poems
     - 1.3.1 All The World's A Stage – W. Shakespeare
     - 1.3.2 No Men are Foreign- James Kirkup

2. The Art of Précis Writing (04 hrs)

3. Grammar and Usage (08 hrs)
   - 3.1 Narration
   - 3.2 Voice
   - 3.3 Idioms and Phrases

4. **Correspondence** (04 hrs)
   - 4.1 Business Letters
   - 4.2 Personal letters
   - 4.3 Application for Job

5. **Drafting** (06 hrs)
   - 5.1 Report Writing
   - 5.2 Inspection Notes
   - 5.3 Memos, Circulars
   - 5.4 Telegrams
   - 5.5 Press Release
   - 5.6 Agenda and Minutes of Meetings

6. Glossary of Technical & Scientific Terms (04 hrs)

7. **Communication** (08 hrs)
   - 7.1 Media and Modes of Communication
   - 7.2 Channels of Communication
   - 7.3 Barriers to Communication
   - 7.4 Listening Skills- Types of Listening
   - 7.5 Body language

LIST OF PRACTICALS

1. Practice on browsing information from Internet
2. Group Discussions
3. Mock Interviews
4. Telephone Etiquette – demonstration and practice
5. Situational Conversation with feedback through video recording
6. Presentation on a given theme (using PowerPoint)
7. Exercises leading to personality development like mannerism, etiquettes, body language etc.
8. Reading unseen passages
9. Writing (developing) a paragraph
10. Exercises on writing notices and telephonic messages

Note:

1) The Text Book on "English and Communication Skills, Book-II By Kuldip Jaidka et. al. developed by NITTTR, Chandigarh is recommended to be used for teaching & setting-up the question papers.

2) A communication laboratory may be set up consisting of appropriate audio-video system with facility of playing CDs/DVDS and a video camera for recording the performance of each student with play back facility. A set of CDs from any language training organization e.g. British Council etc. may be procured for use of students.

3) Elements of body language will be incorporated in all practicals

4) *The practical exercises involving writing may also be included in Theory Examination.*

RECOMMENDED BOOKS

1. *English and Communication Skills, Book-II By Kuldip Jaidka, Alwainder Dhillon and Parmod Kumar Singla, Prescribed by NITTTR, Chandigarh & Published By Abhishek Publication, 57-59, Sector-17, Chandigarh*
2. *Essentials of Business Communication by Pal and Rorualling; Sultan Chand and Sons*
3. *The Essence of Effective Communication, Ludlow and Panthon; Prentice Hall of India*
4. *New Design English Grammar, Reading and Writing Skills by AL Kohli (Course A and course B), Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,*
5. *New Design English Reading and Advanced Writing Skills for Class XI and XII by MK Kohli and AL Kohli; Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,*
6. *A Practical English Grammar by Thomson and Marlinet*
7. *Spoken English by V Sasikumar and PV Dhamija; Tata McGraw Hill*
8. *English Conversation Practice by Grount Taylor; Tata McGraw Hill*
9. *Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi*
10. *Business Correspondence and Report Writing by RC Sharma and Krishna Mohan; Tata McGraw Hill Publishing Company Ltd. New Delhi*
11. *Communication Skills by Ms R Datta Roy and KK Dhir; Vishal Publication, Jalandhar*

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	14	40
2	4	10
3	8	15
4	4	10
5	6	10
6	4	5
7	8	10
Total	**48**	**100**

GLOSSARY OF TECHNICAL & SCIENTIFIC TERMS

1. Absolute	परम, अचर, पूर्ण, स्थिर
2. Acceleration	त्वरण, प्रवेग
3. Acid	अम्ल
4. Alkaline	क्षारीय, खारा
5. Air Compressor	वायु-संपीडक
6. Air Conditioning	वातानुकूलन
7. Alignment	सरेखन
8. Alternating Current	प्रत्यावर्ती धारा
9. Altimeter	ऊंचाई मापने का यंत्र
10. Alum	फिटकरी
11. Ammeter	अम्मीटर
12. Ampere	ऐम्पियर
13. Amplication	प्रवर्धन
14. Amplitude	आयाम
15. Angle	कोण
16. Angluar Velocity	कोणीय वेग
17. Angular Momentum	कोणीय संवेग
18. Annealing	तापानुशीतन
19. Anode	अनोड
20. Apex	शीर्ष, शिखर, शिखाग्र
21. Apparent	स्पष्ट
22. Applied Machanics	अनुप्रयुक्त यंत्रिकी
23. Applied Science	अनुप्रयुक्त विज्ञान
24. Archimedes's Principle	आर्किमिडीज़ का सिद्धांत
25. Architecture	वास्तुकला, स्थापत्यकला
26. Armature	आर्मेचर
27. Atom	परमाणु
28. Automatic	स्वचलित
29. Axis	अक्ष
30. Axle	धुरी
31. Balance (Scale)	तुला, तराजू
32. Ball Bearing	बाल-बेयरिंग
33. Bar magnet	छड़-चुम्बक
34. Barometer	वायुदाबमापी
35. Base	आधार
36. Base Plate	आधार पट्टिका
37. Battery	बैटरी
38. Beaker	बीकर
39. Bending Moment	वंकन आधूर्ण
40. Blast Furnace	झोंका भट्टी
41. Bleach	विरंजक
42. Boiler	उबालक
43. Bridge	पुल
44. Burette	ब्यूरेट
45. Callipers	कैलिपर्स
46. Calorie	कैलोरी
47. Canal	नहर
48. Capacitance	धारिता
49. Carburettor	कार्बुरेटर
50. Cast Iron	ढलवा लोहा

51.	Catalyst	उत्प्रेरक
52.	Cathode	कैथोड
53.	Centre of Gravity	गुरुत्वाकर्षण – केन्द्र
54.	Centrifugal	उपकेन्द्रीय
55.	Centripetal	अभिकेन्द्रीय
56.	Centroid	केन्द्रीय
57.	C.G.S. System	सी.जी.एस. पद्धति
58.	Chemical Action	रासायनिक क्रिया
59.	Chai	श्रृंखला, माला ·
60.	Change of State	अवस्था परिवर्तन
61.	Characteristics	लक्षण
62.	Charge (n)	आवेश
63.	Choke	चोक
64.	Chord, Major	गुरु स्वर – संघात
65.	Chord, Minor	लघु स्वर – संघात
66.	Circular	वृत्ताकार, वर्तुल
67.	Clock-wise	दक्षिणा वर्त
68.	Coagulatio	स्कंदन
69.	Coefficient of Expansion	प्रसार गुणांक
70.	Coil	कुंडली
71.	Combustion	दहन
72.	Compass	दिशासूचक
73.	Compound	यौगिक
74.	Concave	अवतल
75.	Convex	उत्तल
76.	Concentrated (Solution)	गाढ़ा, सांद्रित (घोल)
77.	Concrete	कंकरीट
78.	Conduction	चालन
79.	Conductor	चालक
80.	Cone	शंकु
81.	Connection	सम्बंध, जोड़
82.	Constant (Adj.)	स्थिर, अचल, एकसमान
83.	Convection	संवहन
84.	Coulomb	कूलोम (विद्युत शक्ति की इकाई)
85.	Couple	बल युग्म
86.	Crane	क्रेन
87.	Crystalline	रवेदार
88.	Dehydrate	निर्जल करना
89.	Distil	आसहन करना
90.	Effervescence	बुदबुदाहट
91.	Element	तत्त्व, मूलतत्त्व
92.	Empirical Formula	मूलअनुपाती सूत्र
93.	Equivalent Weight	तुल्यांकी – भार
94.	Flame Test	ज्वाला – परीक्षण
95.	Flash Point	प्रज्वलन – ताप
96.	Flask	फ्लास्क
97.	Spring Balance	कमानी तुला
98.	Soluble	विलयशील
99.	Viscosity	गाढ़ापन
100.	Volumetric Analysis	आयतनी विश्लेषण

2.2 APPLIED MATHEMATICS - II

L	T	P
5	-	-

RATIONALE

Applied mathematics forms the backbone of engineering students. Basic elements of Differential calculus and integral calculus and statistics have been included in this course. This will develop analytical abilities to apply in engineering field and will provide continuing educational base to the students.

DETAILED CONTENTS

1. **Algebra** (12 hrs)

1.1 Determinants: Elementary properties of determinants up to 3rd order, consistency of equations, Crammer's rule.

1.2 Matrix: Algebra of matrices, Inverse of a matrix, matrix inverse method to solve a system of linear equations in 3 variables.

2. **Co-Ordinate Geometry** (18 hrs)

2.1 Equation of straight line in various standard forms (without proof), inter section of two straight lines, angle between two lines. Parallel and perpendicular lines, perpendicular distance formula

2.2 General equation of a circle and its characteristics. To find the equation of a circle, given:

* Centre and radius
* Three points lying on it
* Coordinates of end points of a diameter;

2.3 Definition of conics (Parabola, Ellipse, Hyperbola) their standard Equations without proof.
Problems on conics when their foci, directrices or vertices are given.

3. **Integral Calculus** (34 hrs)

3.1 Integration as inverse operation of differentiation

3.2 Simple integration by substitution, by parts and by partial fractions (for linear factors only)

3.3 Use of formulas

$$\int_0^{\pi/2} Sin^n x dx, \quad \int_0^{\pi/2} Cos^n x dx, \quad \int_0^{\pi/2} Sin^m x\, Cos^n x dx$$

for solving problems Where m,n are positive integers

3.4 Applications of integration for :

(a) Simple problem on evaluation of area bounded by a curve and axes.

(b) Calculation of Volume of a solid formed by revolution of an area about axes. (Simple problems).

4. **Vector Algebra** (10 hrs)

a) Definition notation and rectangular resolution of a vector.

b) Addition and subtraction of vectors.

c) Scalar and vector products of 2 vectors.

d) Simple problems related to work, moment and angular velocity

5. **Differential Equations** (06 hrs)

Solution of first order and first degree differential equation by variable separation method (simple problems)

RECOMMENDED BOOKS

1. *Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi.*
2. *Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar*
3. *Applied Mathematics by Dr. RD Sharma*
4. *Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain/ M.L. Moudgil & P.C. Chopra, Eagle Parkashan, Jalandhar*
5. *Comprehensive Mathematics, Vol. I & II by Laxmi Publications*
6. *Engineering Mathematics by Dass Gupta*
7. *Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi*
8. *Comprehensive Mathematics, Vol. I & II by Laxmi Publications*
9. *Engineering Mathematics, Vol I, II & III by V Sundaram et.al, Vikas Publishing House (P) Ltd., New Delhi*
10. *Engineering Mathematics by N.Ch.S.N Iyengar et.al, Vikas Publishing House (P) Ltd., New Delhi*
11. *Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,*
12. *Engineering Mathematics, Vol I & II by AK Gupta, Macmillan India Ltd., New Delhi*

SUGGESTIVE DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	12	20
2	18	20
3	34	40
4	10	10
5	06	10
Total	**80**	**100**

2.3 GRAPHIC PRESENTATION-II

L	T	P
-	-	6

RATIONALE

Graphic presentation forms a core subject for preparing perspective drawings, scale drawings, three dimensional views, furniture drawings and layouts. Therefore, this course aims at equipping the students with the skills of graphic presentation. Teachers are expected to lay considerable stress on practical work so that student attain desired competencies for preparing good quality perspectives of interior and exterior of buildings in different media. Teachers are also expected to stress upon appropriate line work, properties, dimensioning, lettering, printing, colour rendering techniques, shades/shadows and sciography.

DETAILED CONTENTS

(A). Isometric Projections and Views:

1. Terminology – Isometric Scale
2. Box Methods
3. Co-ordinate (or) off set method.
4. Four centre method,
5. Isometric projection of areas

38Hrs.

6. Simple problem of Isometric view of various forms such as cube, box, Interior of rooms, tower, stairs

(B). Perspective Exercises on the following:

1. Fundamentals, dimension, fore shortening and convergence
2. Reality and appearance
3. Basis of perspective, cone of vision, central visual ray, picture plane, line of sight through picture plane, spectator
4. Principal aids of perspective, vanishing points eye level (2 sheets)
5. Study of cube in perspective.
6. Characteristics of perspective construction, determining vanishing points

20 Hrs.

7. Two-point perspective

(C).

1. Two-point perspective of a simple building with and without overhead roof
2. Perspective division of an area into areas of equal sizes
3. Two-point perspective of a simple house, dividing point method, perspective grid
4. Perspective drawing using short cut methods and dividing arc methods
5. Relationship between Station point (Spectator) picture plane and perspective; comparative study of perspective by changing position of station point from one side and in front of picture plane
6. Shadows of plan, elevation and perspective, front lighting, side lighting, back-lighting, point-lighting from one light source, reflections in perspective
7. Three point perspective, Bird's eye-view
8. Shades and shadows of rounded bodies, shadow in a circular opening, shades and shadows of sphere and hollow sphere
9. Rendering of perspective in different mediums, ink, colour, charcoal, crayous
10. Free hand perspective views

38 Hrs.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	38	40
2	20	20
3	38	40
Total	**96**	**100**

2.4 BUILDING MATERIALS-II

L	T	P
3	-	-

RATIONALE

Diploma holders in Architectural Assistantship are supposed to prepare working drawings of buildings. Knowledge of building materials is very essential from the point of construction materials as well providing detailed specifications in the detailed drawings. Therefore, the course in building materials includes imparting basic knowledge in the properties and use of the important materials like; exterior and interior finishes, glass, plastics, building hardware, ceiling and roofing materials, additives and admixtures, adhesives etc.

Teachers are expected to demonstrate the samples of different materials, discuss their properties with particular reference to their use and appearance in particular situations depending upon climate and environmental conditions of the site where the materials are to be used. Students should be encouraged to collect samples of various materials and efforts should be made to maintain a good building material museum.

DETAILED CONTENTS

1. **Floor Finishes**:
   - 1.1 Terrazzo Tiles
   - 1.2 Glazed earthen and ceramic tiles
   - 1.3 CC Tiles
   - 1.4 Marble stone
   - 1.5 Kota stone
   - 1.6 Linoleum
   - 1.7 Rubber
   - 1.8 Cast iron grid

   Their sizes, availability and uses (7hrs)

2. **Wall Finishes:**
   - 2.1 Wall board homogeneous
   - 2.2 Laminated fibers
   - 2.3 Polystyrene wall tiles
   - 2.4 Plastic wall tiles
   - 2.5 Wall papers
   - 2.6 Cork sheets and tiles
   - 2.7 Thermocoles
   - 2.8 Foam rubber tiles and rolls
   - 2.9 Glow Walls. (4hrs)

3. **Ceiling Materials**:
   - 3.1 Hession cloth
   - 3.2 Gypsum plaster boards
   - 3.3 Plain a.c. sheets
   - 3.4 Plywood
   - 3.5 Hard Board
   - 3.6 Cellotex
   - 3.7 Fibre Boards
   - 3.8 Glass Roof tiles
   - 3.9 Asbestos tiles
   - 3.10 Thermofriz

   Their trade names, availability, sizes and uses (5hrs)

4. **Building Hardware:**

Tower bolts
Hinger
Door Handles
Fan-light catches
Door springs
Latches
Floor door stopper
Fan light pivots
Mortice lock
Door closer
Ventilator chains
Wire gauze

Their sizes, materials and uses as per BIS (7hrs)

5. **Glass :**

Sheet glass
Wired glass
Laminated safety glass
Plate glass
Insulating glass
Obscured glass
Coloured glass
Tinted glass
Heat absorbing glass
Glass blocks
Glazing putty

Their sizes and uses. (5hrs)

6. **Roofing Materials:**

Asbestos sheets
GI sheets

Their standard sizes and uses (5hrs)

7. **Additives and Admixtures:-**

7.1 Water repellants
7.2 Accelerators
7.3 Air entraining agents
7.4 Hardness
7.5 Workability increasing agents
7.6 Fly ash

Their availability and uses (5hrs)

8. **Adhesives:**

8.1 Synthetic resins

Their trade names and uses (5hrs)

9. **Steel:**
   9.1 Mild Steel
   9.2 Medium Tensile Steel
   9.3 Hard drawn steel wire (5 hrs)
   9.4 Deformed steel their properties and uses
10. Aluminum: Its properties and uses (5 hrs)

Note:- *Students may be exposed to the latest material available in the market- survey to be conducted for comparative study for quality and cost basis.*

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	7	15
2	4	10
3	5	10
4	7	15
5	5	10
6	5	10
7	5	10
8	5	10
9-10	5	10
Total	**48**	**100**

2.5 BUILDING CONSTRUCTION-I

L T P
2 - 6

RATIONALE:-

Students of Architectural Assistantship at diploma level are supposed to prepare structural drawings, working drawings and detailed drawings of various components of buildings. Also students are expected to design small residential buildings. For this purpose, it is essential that students are taught various components of building construction comprising of: foundations, super structure, openings, roofs, staircases, flooring and finishing and other allied building components.

Therefore, the subject of building construction is very important for students undergoing diploma course in Architectural Assistantship.

Teachers while imparting instructions are expected to show various components of buildings under construction, make use of models or other audio-visual media to clarify the concepts. While preparing drawings, teachers should lay considerable stress on proportioning, dimensioning, specification writing and printing and composition of drawing work. Teachers should also emphasis on environmental aspects like lighting, ventilation and orientation of buildings. Students should be asked to maintain a sketch book for recording the observations from site visits. While conducting viva, teachers should point out specific mistakes done by students in the preparation of drawings.

DETAILED CONTENTS

Theory

1. **Brick Work and Stone Work**
   - 1.1 Different sizes and types of bricks
   - 1.2 Wall thickness, T-junctions, cross junction and bonds
   - 1.3 Brick jalies
   - 1.4 Stone facings and claddings and classification of masonry
2. **Openings in walls**
   - 2.1 Classification of arches as per finish, shape and material
   - 2.2 Classification of lintels of different materials, precast and cast-in-situ
3. **Damp Proof Course: (DPC)**
   - 3.1 Sources of dampness and effects of dampness
   - 3.2 Classification as per hardness or rigidity of material
   - 3.3 Treatment of building components for effective damp proofing
4. **Foundations:**
   - 4.1 Different types of foundations with reference to advantage of one over the other
   - 4.2 Foundations of different types with reference to method of construction.
   - 4.3 Foundations for special circumstance

NOTE: *Field visits should be organized to clarify concepts*

Practical

Drawing Work

1. Drawing of different shapes and sizes of bricks. (24 hrs)
2. Drawings of different bonds wall thickness 10,20,30,40 Cm thick, T-junctions, cross junction Brick work and jalies Simple Brick Jali and RCC Jali. (25hrs)
3. Drawings of lintels and arches of various materials . (25 Hrs)
4. Drawing of spread foundation and application of DPC on spread foundation and basements. (30 Hrs)
5. Section through lintel, Window, Arch door, foundation. (24 Hrs)

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	24	20
2	25	20
3	25	20
4	30	20
5	24	20
Total	**128**	**100**

2.6 THEORY OF DESIGN

L T P
3 - -

RATIONALE

Students of Architectural Assistantship at diploma level are supposed to understand basic principles of theory of design while designing some building. All students should know the physical aspects of Architecture like: form, function, balance, light and shadow, shape, plane, volume, line, proportions, rythem, texture, emphasis, contrast, colour and other related elements.

Therefore, the subject of theory of design is very important for students undergoing diploma course in Architectural Assistantship because it is the basis of Architecture.

Teachers while imparting instructions are expected to teach various elements used in designing buildings. Teachers may make use of models and audio-visual aids to clarify the concepts. Group discussions and seminars may also be organized to discuss various concepts and principles involved in the design. It is recommended that teachers may organize visits to work sites to clarify the concepts and principles involved.

DETAILED CONTENTS

Theory of Design: Definitions, examples and applications of the following:

1. **Primary elements of design:** (4hrs)
   - 1.1 Point
   - 1.2 Line
   - 1.3 Figure
   - 1.4 Plane

2. **Design elements:**
   - 2.1 Composition (4hrs)
     - 2.1.1 Shape
     - 2.1.2 Size
     - 2.1.3 Form
     - 2.1.4 Function
   - 2.2 Balance (4hrs)
     - 2.2.1 Symmetry and stability
     - 2.2.2 Formal balance and informal balance
   - 2.3 Texture (4hrs)
     - 2.3.1 Surface Quality
     - 2.3.2 Light, structure, pattern
   - 2.4 Pattern (4hrs)
   - 2.5 Contrast (4hrs)
     - 2.5.1 Light and Shade
     - 2.5.2 Nature and man made
   - 2.6 Rythem and movement (4hrs)

2.6.1 Rythem in nature

   - 2.7 Proportion (4hrs)
   - 2.8 Scale (4hrs)
     - 2.8.1 Monumental Scale
     - 2.8.2 Human Scale
     - 2.8.3 Intimate Scale
   - 2.9 Emphasis (4hrs)
   - 2.10 Colour
     - 2.10.1 Effect of colour on building
     - 2.10.2 Colour chart
     - 2.10.3 Colour variations (Contrasting colours) (4hrs)
   - 2.11 Circulation (4hrs)

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	4	10
2	44	90
Total	**48**	**100**

2.7 ARCHITECTURAL DESIGN-I

L T P
2 - 6

RATIONALE

Large percentage of diploma holders in Architectural Assistantship find employment with private architects and also majority of them go for self-employment. Therefore, diploma holders are required to design small residential and public buildings. This course aims at providing practical exercises in
designing so as to develop appropriate knowledge and skills in building design.
Teachers are expected to show various types of designs of small to medium residential buildings to develop an appreciation of different designs. Teachers should also motivate students to maintain their sketch book in which they draw line sketches of different architectural styles.

DETAILED CONTENTS

1. Composition of sheet (6hrs)
2. Problem of composition of lines (one exercise) , Problem on composition of various geometrical figures(square, triangle, circle, rectangle, pentagon etc.) in different tone of texture (two exercises). (10hrs)
3. Preparation of plan and elevation from the models of various forms (composition of prisms, cubes, cylinders etc.)- (one exercise) (8hrs)
4. Study of spaces required for different human activities(one sheet) (8hrs)
5. Design studies in relation to furniture layout - (22hrs)
   - 5.1 Living Area
   - 5.2 Dining Area
   - 5.3 Sleeping Area
   - 5.4 Study Area

   All studies to be made through plans.
6. Design studies of combination of above areas under fixed roofs:
   - 6.1 Living, dining and kitchen
   - 6.2 Study, bedroom and toilet

   All studies to be made through plans (14hrs)
7. Design of one room house on ground floor
   - 7.1 Circulation analysis
   - 7.2 Presentation Drawing
     - 7.2.1 Plan
     - 7.2.2 Elevation
     - 7.2.3 Section
     - 7.2.4 Isometric View (60hrs)

***Note:** *Students may encouraged to prepare a paper mode of various geometrical figure.*

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	6	5
2	10	5
3	8	5
4	8	5
5	22	10
6	14	10
7	60	60
Total	**128**	**100**