

Scheme of Teaching and Examination for III Semester DIPLOMA in ARCHITECTURAL ASSISTANTSHIP BRANCH THEORY

SL. No	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME					
			Periods per Week	Periods in one Session	Hours of Exam.	Terminal Exam. (A) Marks	Final Exam. (B) Marks	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
1	Perspective & Sciography	37301	6	60	3	20	80	100	26	36
2	Engineering Mechanics	00302	4	50	3	20	80	100	26	36
3	Architectural Design & Drawing-I	37303	12	120	4	20	80	100	26	36
4	Computer Application in Architecture	37304	6	60	3	20	80	100	26	36
5	Climatology	37305	4	50	3	20	80	100	26	36
Total :-			32					500		

PRACTICAL

SL. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME					
			Periods per Week	Periods in one Session	Hours of Exam.	Marks Internal Exam. (A)	Marks External Exam. (B)	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
6	Engineering Mechanics Lab.	00306	4	50	3	10	40	50	16	21
7	Computer Application in Architecture Lab.	37307	6	60	3	20	80	100	32	42
Total :-			10					150		

SESSIONAL

SL. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME			
			Periods per Week	Periods in One Session	Marks of Internal Examiner (X)	Marks of External Examiner (Y)	Total Marks (X+Y)	Pass Marks in the Subject
10	Architectural Design & Drawing-I	37308	–	–	40	60	100	50
Total :-							100	

Total Periods per Week	42	Total Marks	750
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PRESPECTIVE & SCIOGRAPHY

Subject Code 37301	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06			Internal Exam.	:	20

Rationale:

This subject will help the students to understand various facts, concepts and procedures of perspective drawing. The subject will also help in making models of different materials, free hand sketching of monuments etc.

Objective:

The student will be able to: -

- 1) Understand different methods of drawing perspective views
- 2) Understand free hand coloured drawings of buildings and monuments
- 3) Make models
- 4) Sketch free hand coloured perspective.

1	Perspective		Periods
1.1	Characteristics of perspective construction, determining vanishing points		(10)
1.2	Two point perspective – Two point perspective of a simple building with or without overhang roof, two points perspective of a small house		
1.3	Relationship between station point (spectator), picture plane and perspective. Comparative study of perspective by changing position of station point from one side and front of picture plane		
1.4	Shadows in perspective – Front lighting, side lighting, back lighting, point lighting from one light source and reflections in perspective		
1.5	Only simple square edge figures not to include rounded or curved bodies		
1.6	Birds eye view		
2	Water Colour Washes		(20)
2.1	Washes : -		
	i) Flat wash		
	ii) Graded washes colour		
	iii) Graded washes(two colour)		
	iv) Grades washes (three colour)		
	v) Grades washes with a verical shine in the center		
	vi) Grades washes with digonal shine		
	vii) Glare wash		
	viii) Two glare washes – one over the other		
2.2	skies – Three types		
2.3	Architectural trees		
2.4	How skies help to define the building		
2.5	Simple building landscapes		
3	Mural Design		(10)
3.1	Mural design and collage		
4	Sketching		(10)
4.1	Free hand sketching of monuments and buildings in different techniques and medium		

Books:

- 1 Philip J Lawson, Practical Perspective Drawing, Mc Graw Hill Book Coropration, London
- 2 W. Abbott, Theory and practice of perspectives, Balckie & sons Ltd. London
- 3 Civil A Farey Architectural Drawing Perspective & rendering` B.T.Batsford Ltd. London
- 4 James More head Hadnbook of Perspective drawing Elsever Press, Inc. Texas
- 5 Robert W. Gill Rendering with pen and ink Thames & Hudson Ltd., London
- 6 Bernaud Atkines The water colour techniques of Architectural rendering Walter T. Foster
- 7 Shah, Kale, Patki Perspective Drawing Tata Mc Graw Hill Publication Ltd, Delhi

ENGINEERING MECHANICS

Subject Code 00302	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	04	00	00	Internal Exam.	:	20

Rationale:

The subject forms an important part of Engineering curricula for developing the concepts required in the design of various structures. The subject deals with the basic concept of mechanics of body and the behaviour of material used in practice and in structures under varying load conditions. The first part of the subject deals with the applied mechanics science. Which describe the condition of body in rest or motion under the action of forces. In its preview come variety of general and specialized engineering disciplines concerned with analysis of structures and machines and the mechanism of their parts.

In the Second part, the principles of strength of materials is introduced in which the student will learn to distinguish between different types of stress and strain and also the qualitative assessment of stress and strains in material element under the action of internal forces.

Objective:

Knowledge Workers will be able to:

- Analyze and understand the physical behaviour of members of engineering structures.
- Acquire knowledge of various elements of structures.
- Utilise the basic principles.
- Develop skill to tackle field problem.
- Solve the problems by the application of basic principles.
- Judge the suitability of materials in design process.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
<u>PART-A</u>		
01	Introduction	(02)
02	Vector Methods	(02)
03	Introduction to system of forces and equilibrium	(06)
04	Friction	(04)
05	Kinematics and kinetics of a particle	(03)
06	Kinematics and kinetics of rigid body	(02)
07	Impulse and Momentum	(02)
08	Work, Energy and Power	(04)
Total :		(25)
<u>PART-B</u>		
01	Simple stress and strains	(07)
02	Elastic constants	(03)
03	Center of Gravity (Centroid)	(02)
04	Moment of Inertia	(05)
05	Shearing force and bending moments	(08)
Total :		(50)

CONTENTS:

PART-A

TOPIC: 01 – INTRODUCTION: [02]

Idealisation of mechanics; Concept of rigid body; External forces (Body forces & surface forces) Law of Mechanics.

TOPIC: 02 VECTOR METHODS: [02]

Equality and equivalence of vectors; Free and Bound vector; Moment of a force about a point and a line; Couple and moment of a couple.

TOPIC: 03 – INTRODUCTION TO SYSTEM OF FORCES AND EQUILIBRIUM: [06]

Statically equivalent force system; simplest equivalent of a system of forces; force analysis, free body diagram, equation of equilibrium.

<u>TOPIC: 04 – FRICTION:</u>	[04]
Basic Concept of different Friction (Static, Dynamic, Sliding, Rolling, Fluid).	
<u>TOPIC: 05 – KINEMATICS AND KINETICS OF A PARTICLE:</u>	[03]
Rectilinear and curvilinear translations; normal and tangential component of acceleration.	
<u>TOPIC:06 – KINEMATICS AND KINETICS OF RIGID BODY:</u>	[02]
Simple concept of Angular Velocity and angular acceleration. Effective forces on a rigid body. D’ Alembert’s principle.	
<u>TOPIC:07 – IMPULSE AND MOMENTUM:</u>	[02]
Linear impulse and linear momentum, angular impulse and angular momentum, definitions only;	
<u>TOPIC: 08 – WORK, ENERGY AND POWER:</u>	[04]
Work done by forces and couples, potential and kinetic energy, work-energy; conservation of energy; concept of power and efficiency.	

PART-B

<u>TOPIC: 01 – SIMPLE STRESSES & STRAIN:</u>	[07]
01.01	Definition of various terms and their units (S.I. Units)
01.02	Stress and strain due to axial load and transverse load relation between stress and strain. Hook’s law. Studies of stress strain curve. Factor of safety & working stress. Concepts of isotropic materials.
01.03	Stress & strain in simple section & composite bar. Stress & strain due to temperature variation.
01.04	Shrinking on hoop’s stresses.
<u>TOPIC: 02 – ELASTIC STRESS & STRAIN:</u>	[03]
02.01	Linear strain and lateral strain, poisson’s ratio, volumetric strain
02.02	Change in volume due to axial, biaxial & triaxial loading. Bulk modulus.
02.03	Shear stress and strain, modulus of rigidity.
02.04	Simple shear. Complementary shear stress.
02.05	Various Relations among modulus of elasticity, modulus of rigidity & bulk modulus.
<u>TOPIC: 03 – CENTER OF GRAVITY (CENTROID):</u>	[02]
03.01	Definition of center of gravity & centroid.
03.02	Determination of C.G of various sections symmetrical and unsymmetrical sections.
03.03	Determination of C.G. of perforated sections.
<u>TOPIC: 04 – MOMENT OF INERTIA:</u>	[05]
04.01	Definition of M.I.; radius of gyration, second moment of area.
04.02	Parallel axis theorem & perpendicular axis theorem.
04.03	Derivation of M.I. of regular area-rectangular, triangular circular about centroidal axis.
04.04	M.I. of built up section, symmetrical and unsymmetrical about centroidal axis, modulus of sections.
<u>TOPIC: 05 – SHEARING FORCE & BENDING MOMENT:</u>	[08]
05.01	Types of beams and types of supports, types of loading.
05.02	Concept and definitions of shear force and bending moment, sign convention.
05.03	Shear force and bending moment diagrams for cantilever, simply supported beam, over hanging beam for various types of loading & couples, point of contraflexure.
05.04	Relation between B.M, S.F. and rate of loading.

Books Recommended:

Text Books

1.	Strength of Materials	-	R.S. Khurmi
2.	Mechanics of Structure	-	S.B. Junarkar
3.	Strength of Materials	-	Ramamrutham
4.	Theory of Structure	-	Vazirini & Ratwani
5.	Strength of Materials & Mechanics of Structure.	-	Punamia
6.	Teaching plans of Strength of Material	-	T.T.T.I. Madras
7.	द्रव्य सामर्थ्य	-	गुरुचरण सिंह
8.	Engineering Mechanics	-	I.H. Shames
9.	Engineering Mechanics	-	Beer & Johnson
10.	Strength of material	-	S.K. Singh

Architectural Design & Drawing - I

Subject Code 37303	Theory			No of Period in one session : 120		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	12			Internal Exam.	:	20

RATIONALE

Free hand sketching, colouring and rendering like sketching, shades and shadows, lettering and printing forms important components of Architecture discipline. 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 and other above mentioned areas.

Teachers are expected to lay considerable stress on practical work so that students attain sufficient skills in sketching, lettering and printing and 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 and printing. Diploma holders in Architectural Assistantship find employment with private architects and also majority of them go for self-employment. Therefore, they are required to develop aptitude/skills to design residential, commercial and other public buildings.

Teachers while imparting instructions/giving assignments to students are expecting to teach various elements of design like form function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such related elements. Teachers are also expected to show various types of designs of small building to develop and appreciation for this subject.

Teachers should also motivate students to maintain sketch book/portfolio of all the assignments given to the students.

DETAILED CONTENTS

Chapter	Name of the Topic	Periods
01	Drawing Techniques 1.1 Use of Architectural Instruments 1.2 Use of Pencil – tones – texture 1.3 Use of Colour – tones – texture	8
02	Composition of 2D & 3D 2.1 Composition of 2D surfaces in tone, colours and textures 2.2 Principles of design 2.3 Elements of design 2.4 Composition of 3D surfaces 2.5 Problems based on principles & elements of Architecture	12
03	Proportion of Components of Human Body The proportions of the different components of the human body; Examples from Le Corbusier Modular Man, Vitruvius Marco Pollione, Vastu Pursha Mandala	16
04	Human Activities Requirement of space (2-D, 3-D) for various human activities (Single and multiple uses of spaces such as queues etc.)	16
05	Furniture Standards Furniture standards (sizes of domestic and public furniture); Toilet and Kitchen equipment - sizes and standards; Doors and windows - sizes, standards and locations.	14

06	Vehicles Vehicles in motion, parking along with turning radii for two-wheelers, cars, buses, vans etc. Standard road width.	12
07	furniture Standards for drinking fountains, waiting queues at bus stops, garden seats, waste bins, telephone booths, street lights, foot paths, public walkways, railing etc.	16
08	Graphic Representation of plant material (ground cover, foliage, shrubs, trees) human figures and vehicles.	12
09	Development of architectural drawing from given sketch design of building involving two or more floors and split levels	14

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera
2. Architects Data by Neufert
3. Space, Time and Order by DK Ching
4. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera
5. Architects Data by Neufert
6. Space, Time and Order by DK Ching

Computer Application in Architecture

Subject Code 37304	Theory			No of Period in one session :60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	6			Internal Exam.	:	20

RATIONALE

In the present times an architectural assistant should be capable of drafting drawings on the computer as most of the architects lay greater stress on computerized drawings for their ease of drafting, editing, managing and presentation. At the end of the course the students should be able to make 2-D architectural drawings for presentation and construction purposes. The student should get familiar with the latest AutoCAD software

DETAILED CONTENTS

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

- | | | |
|----|--|-----------|
| | | (Periods) |
| 1. | Introduction to 2-D CAD | (8) |
| | <ul style="list-style-type: none"> • Input devices • Graphics • Starting AutoCAD • Inside the drawing editor • Commands in the menus (Tool bars) • Accessing Commands • Entity selection • Entering coordinates • Folders for organizing drawings and files | |
| 2. | Creating and saving a new Drawing | (4) |
| | <ul style="list-style-type: none"> • Commands and options to create new drawings • Units • Limits • Snap • Grid • Ortho • Layer • Application of layers • Open a new, existing drawing • Save, save as, quit, close, exit | |
| 3. | Drawing Commands | (14) |
| | <ul style="list-style-type: none"> • Line • Poly line/Double line. • Arc • Ellipse • Polygon • Rectangle • SP line • Circle • Sketch. • Hatch • Donuts | |

4. Viewing an Existing Drawing (8)
- Zoom
 - Pan
 - Redraw and Regen all
 - Regen Auto
 - View
5. Modifying an Existing Drawing (14)
- Undo Redo/Oops
 - Trim
 - .Move
 - Offset
 - Rotate
 - Array
 - Stretch
 - Divide
 - Champher
 - Erase
 - Break
 - Copy, multiple copy
 - Mirror (Mirror test)
 - .Change (change properties)
 - Extend
 - Explode
 - Blip mode
 - Scale
 - Fillet
- 6 Making and Inserting Blocks (12)
- Blocks
 - Insert block
 - Base
 - Using library for blocks
 - W-block
 - X-ref
 - Explode

Climatology

Subject Code 37305	Theory			No of Period in one session : 20		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	4			Internal Exam.	:	20

RATIONALE

Understanding of the basic principles of climatology and environment are very important for diploma holders in Architectural Assistantship. The knowledge of this subject will be very useful in the design of buildings.

Teachers are expected to impart instructions of the above course keeping in view the effect of above course in the design of buildings

DETAILED CONTENTS

	Periods
1. Earth and Global Climate:	(4)
<ul style="list-style-type: none"> • Introduction to climatology • Movement of earth around sun, • Elements of climate (Wind, temp, humidity, precipitation, pressure). • Different climate zones. 	
2. Relationship of Climate and Comfort	(6)
<ul style="list-style-type: none"> • Micro-Macro climatic effects. • Concept of comfort zone and bio climatic chart. • Adaptation techniques as per climatic zone (Natural and Artificial methods) 	
3. Sun Protection Devices:	(16)
<ul style="list-style-type: none"> • Orientation for Sun • Sun chart (sun-path diagram) • Design of louvers (horizontal & Vertical) • Natural lighting • Introduction and objectives of solar passive design. • Passive Solar heating system (direct gain, indirect gain, isolated gain) 	
4. Wind Control	(8)
<ul style="list-style-type: none"> • Orientation for Wind. • Passive solar cooling (direct solar radiation, convective cooling, conductive cooling, evaporative cooling system. 	
5. Use of Building Materials with respect to climate	(4)
<ul style="list-style-type: none"> • (Concrete, Brick ,Glass, Plastic, insulating material) 	
6. Environment and Ecology	(12)
<ul style="list-style-type: none"> • Basic elements, principles and objectives of ecology. • Concepts of natural cycles in eco system. • Sources of air and noise pollution and etc. effects and controls. • Use of landscape elements for micro-macro climate control. 	

REFERENCE BOOKS

1. Tropical Architecture by CP Kukreja
2. Environmental Engg. And Management by Suresh K. Dhameeja.
3. Ecology by E.P. Odem.
4. Design with climate by Arvind Krishan and others

ENGINEERING MECHANICS Lab.

Subject Code 00306	Practical			No of Period in one session :50		
	No. of Periods Per Week			Full Marks		
	L	T	P/S	Annual Exam.	:	50
	04			Internal Exam.	:	40
					10	

Rationale & Objectives:

The Engineering Mechanics Laboratory is a subject which will help technician to understand the application of theory that he has studied in practice by performing experiments and verifying results.

Besides the above the objective of the curriculum with effective skill will be developed in them to observe experimental data, and to analyses the results.

These topics of this curriculum will certainly build their confidence in performing the utilization of principle of mechanics in Civil Engineering works.

CONTENTS:

Eight experiments to be performed in the laboratory:

1. Determination of elongation of wire under external load.
2. Tensile Test on mild steel specimen.
3. Tensile Test on high tensile specimen.
4. Compression Test on metal.
5. Compression Test on bricks.
6. Determination of Young's Modulus of Elasticity of wire.
7. Determination of reaction at the support of beam.
8. Determination of bending moment of a simply supported beam.
9. Determination of reaction at the support of roof truss.
10. Determination of deflection of beams.
11. Determination of moment of inertia of fly wheel.
12. Determination of bending moment of a over hanging beam.
13. Verification of Polygon Law of forces.
14. Verification of Triangle Law of forces.
15. To find moment of inertia of fly wheel.
16. Compression Test on metal.
17. Tensile Test on M.S.specimen.
18. Determination of co-efficient of friction on inclined plane.

Books Recommended:

Text Books

- | | |
|--|-------------------|
| 1. अभियांत्रिक यांत्रिकी | . जे०के० कपूर |
| 2. Strength of Materials | - Bininder Singh |
| 3. Mechanics of Structure, Vol. 1 | - S.B. Junarkar |
| 4. Strength of Materials | - R.S. Khurmi |
| 5. Engineering Mechanics and Strength of Materials | - I.B. Prasad |
| 6. Teaching plans of Strength of Material | - T.T.T.I. Madras |

Computer Application in Architecture Lab.

Subject Code 37307	Practical			No of Period in one session :60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06			Internal Exam.	:	20

RATIONALE

In the present times an architectural assistant should be capable of drafting drawings on the computer as most of the architects lay greater stress on computerized drawings for their ease of drafting, editing, managing and presentation. At the end of the course the students should be able to make 2-D architectural drawings for presentation and construction purposes. The student should get familiar with the latest Auto CAD software

DETAILED CONTENTS

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

1. Introduction to 2-D CAD

Exercise: Creating folders and sub folders

2. Creating and saving a new Drawing

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

3. Drawing Commands

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

4. Viewing an Existing Drawing

Exercise: Viewing, zooming of existing drawing made in section3.

5. Modifying an Existing Drawing

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

6. Making and Inserting Blocks

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

Architectural Design & Drawing - I

Subject Code 37308	Sessional			No of Period in one session :		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	60
				Internal Exam.	:	40

RATIONALE

Architectural Designs drawing is basic of architecture. It prepares the students to become a good architectural assistant. It helps in learning further aspects of architectural drawings. Also this subject will help the students to understand and attain basic skills of Architectural Drawing in order to graphically represent what they learn in other subjects.

Objectives:

The Students will be able to :

- 1) Understand drafting skills and techniques
- 2) Develop the given sketch design in to final drawing
- 3) Develop bubble diagram in to final drawings
- 4) Prepare various types of 2 Dimensional drawings in CAD
- 5) Design simple buildings as per requirements

DETAILED CONTENTS

- Note:**
- a) All dimensions in all segments to be related to human figures.
 - b) Dimensions should be resolved from actual measurements.
 - c) Minimum of 10 sheets should be made in the semester

Chapter	Name of the Topic	No. of Sheets
01	Drawing Techniques 1.4 Use of Architectural Instruments 1.5 Use of Pencil – tones – texture 1.6 Use of Colour – tones – texture	One sheet
02	Composition of 2D & 3D 2.1 Composition of 2D surfaces in tone, colours and textures 2.2 Principles of design 2.3 Elements of design 2.4 Composition of 3D surfaces 2.5 Problems based on principles & elements of Architecture	Two sheet
03	Proportion of Components of Human Body The proportions of the different components of the human body; Examples from Le Corbusier Modular Man, Vitruvius Marco Pollione, Vastu Pursha Mandala	One sheet
04	Human Activities Requirement of space (2-D, 3-D) for various human activities (Single and multiple uses of spaces such as queues etc.)	One sheet
05	Furniture Standards Furniture standards (sizes of domestic and public furniture); Toilet and Kitchen equipment - sizes and standards; Doors and windows - sizes, standards and locations.	One sheet

06	Vehicles Vehicles in motion, parking along with turning radii for two-wheelers, cars, buses, vans etc. Standard road width.	One sheet
07	Street furniture Standards for drinking fountains, waiting queues at bus stops, garden seats, waste bins, telephone booths, street lights, foot paths, public walkways, railing etc.	Two sheet
08	Graphic Representation of plant material (ground cover, foliage, shrubs, trees) human figures and vehicles.	Two sheet
09	Development of architectural drawing from given sketch design of building involving two or more floors and split levels	One sheet
Total no. of Sheets-		12 sheet

RECOMMENDED BOOKS

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