

STUDY AND EVALUATION SCHEME ARCH ASSTT 2013
I SEMESTER

S n	Subject Code	Subject	Teaching Load			Evaluation Scheme						Total Marks
						Internal			External		Hrs	
			L	T	P	Theory	Practical	Theory	Practical			
1	AA-130	Art Appreciation & Graphics I	2	-	7		50		100	6	150	
2	AA-131	Graphic Presentation	2	-	9		50		100	3	150	
3	AA-132	Building Materials I	3	-	--	50		100		3	150	
4	AA-133	Workshop Practice	--	-	3		50		50	3	100	
5	AA-134	Applied Mathematics I	3	2	--	50		100		3	150	
6	AA-135	Communication Techniques I	2	-	--	50		100		3	150	
7	AA -136	Applied Physics	2	-	-	50			50	6	100	
8	AA- 137	Introduction To Computers I	-	-	3	AAG 100, GP 100				6	200	
9	AA-138	Portfolio & Viva I										
10		Outdoor/ Library Exposure	14	2	24						1300	

Portfolio & Viva will be jointly conducted by internal and external examiners and will consist of equal weightage of portfolio and viva in each subject

AA-130 ART APPRECIATION AND GRAPHICS I

L T P

Hours/ Week 2 - 7

Objective: The objective of this course is to make the students well versed in drawing, sketching and 3D visualization. It will provide awareness to students on how design elements are juxtaposed in the object world and the effect they create on the users. The subject also aims at developing the observation skills of students in different aspects of architectural rendering. The course is geared towards providing students with practical hands on exposure.

Following detailed exercises are recommended for this course.

1. Free hand sketching of simple geometrical surface

- 1.1. Free hand drawing of two and three dimensional geometrical objects such as cube, cone, prism, pyramid, cylinder, and sphere (1 sheets)
- 1.2. Free hand drawing of a set of objects (1 sheets)
- 1.3. Free hand sketching of simple buildings and landscaping (4 sheets)
- 1.4. Free hand sketching of monument, building and trees in different techniques and mediums such as, pencil pen, ink, charcoal, coloured-inks, colours and crayons. (4 sheets)

2. Colouring and Rendering Exercises:

- 2.1. Definition and perception of colour and colour materials.
- 2.2. Hue, values and intensity, value scale, and colour wheel (2sheet)
- 2.3. Study of colour; emotional effect of colour, warm and cool colours, receding and advancing colours; effect of light in colour harmony and contrast.
- 2.4. Use of colour in nature, art and architecture.
- 2.5. ~~Shades and shadows, indication of surrounding, sky, clouds, tree, and stylized human figures as used in architectural drawing in pencil, ink, colour and crayons. (4sheet)~~

3. Art Appreciation

- 3.1. Introduction to theory of design - Primary elements of design, composition of elements, balance, rhythm, harmony, contrast, proportion, texture, colour, emphasis
- 3.2. Simple abstract compositions
 - in 2 D (3 sheets) and
 - 3D composition (3 sheets) based on principles of design.

4. Mural design exercises. (2Sheets)

5. Lettering practices. (Spacing between letters & words).

- 5.1. Ratio b/w height and width of letters and numerals, Capitals and smalls 7:4 and 5:4 (2 Sheets)
- 5.2. Free hand single line lettering (small and block) in various style, thickness and heights (3 Sheets)
- 5.3. Lettering with the help of stencils (1 Sheet)

Notes: At least one drawing sheet of lettering should be prepared in Hindi

AA- 131 GRAPHIC PRESENTATION

	L	T	P
Hours/Week	2	-	9

1. Introduction

- 1.1 Drawing equipment and drafting standards.
- 1.2 Line drawing in pencil and ink (2 Sheets).

2. Plain and solid geometry

- 2.1 Geometrical construction of polygons, ellipse, parabola, hyperbola (2 Sheet).
- 2.2 Sub-divisions of lines, polygons (1 Sheet).
- 2.3 Definitions of solid.

2.4 Projection of point, line and plan figures (1 Sheet). ①

2.5 Development of solids (3 Sheets). ①

2.6 Projection of solids in simple positions in 1st angle (5 Sheets).

2.7 Projection of circles, cylinders and cones (3Sheets). ①

2.8 Sections by horizontal and vertical planes and inclined plane (5Sheets). ②

2.9 True shape of sections (2 Sheets).

3. Scale drawing exercise

- 3.1. Plane scales, graphic scale. (3 Sheets)
- 3.2. Dimensioning. (3Sheets)
- 3.3. Orthographic projections of solids (5 Sheets)
- 3.4. Reduction and enlargements of drawings (1Sheet).

4. 3 D exercises

- 5.1 Introduction to 3D drawings
- 5.2. Difference between isometric and perspective drawings
- 5.3. Isometric projections (5Sheets).
- 5.4. Isometric views (2 sheets)

5. Perspective exercises

- 6.1 Reality and appearance.
- 6.2 Basic of perspective, cone of vision, central visual ray picture plane, line of sight through the picture plane, height of spectator.
- 6.3 Fundamentals, dimension, foreshortening and convergence.
- 6.4 Perspective of simple objects. (5 Sheets) ✓
- 6.5 Principal aids of perspective, vanishing point, eye-level, station point.
- 6.6 Study of cones, sphere, cylinder, prism, etc.

6. Graphical representation of different building materials (1 Sheet).

7. Measure Drawing

- 7.1 Measure drawing of a room, plan and elevations of all walls in appropriate scale (2Sheets)

AA - 132 BUILDING MATERIALS - I

	L	T	P
Hours/ Week	3	-	-

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, its correct placement for effective placement in building
- 1.7. Common building stones
 - 1.7.1. Granite, Basalt and Trap, Sandstone, Lime stone, Slate, Marble
 - 1.7.2. Composition, Properties, uses, their origin, transportation and storage Techniques
- 1.8 ✓ Advantages and disadvantages of different types of stones and their suitability to different elements of building

2. Bricks

- 2.1. Classification of bricks and brick earth
- 2.2. Properties and uses of first class and second class bricks, clay and burnt bricks
- 2.3 ✓ Advantages and disadvantages of different types of bricks and their suitability to different elements of building
- 2.4. Characteristics of a good brick
- 2.5. Size and weight of a standard brick
- 2.6. Composition of brick earth
- 2.7. Test for burnt clay bricks
 - Compressive strength test
 - Water absorption test and efflorescence test.
- 2.8. Fire bricks, its properties, uses and availability.

3. Timber

- 3.1. Characteristics and uses of common timbers used in buildings i.e. sal, deodar, kail, cheer, teak, etc.
- 3.2. Characteristics of hardwood and softwood.
- 3.3. Defects in timber.
- 3.4. Characteristics of good timber.
- 3.5. Characteristics & application of various wood boards and other wood products.
- 3.6. Advantages and disadvantages of different types of timber and wood based products and others over timber and their suitability to different elements of building
- 3.7. Seasoning of timber.

4. Lime

- 4.1. Uses of lime, classification of lime
- 4.2. Storing of lime
- 4.3. Advantages and disadvantages of lime and their suitability and uses to different elements of building

5. Cement

- 5.1. Composition of Portland cement
- 5.2. Setting and hardening of cement
- 5.3. Types of cement, their properties and uses
 - Ordinary Portland Cement (OPC)
 - Rapid Hardening Cement
 - High Alumina Cement
 - White Cement
 - Colored Cement
 - Pozzolana Portland Cement
 - Sulphate Resisting Cement
- 5.4. Storage of Cement.
- 5.5. Uses of cement
- 5.6. Advantages and disadvantages of cement and their suitability to different elements of building

6. Mortar

- 6.1. Function and types of Mortar
- 6.2. Preparation of cement mortar & lime mortar and their applications.
- 6.3. Proportion of mortar for different building works.
- 6.4. Different types of sand.
- 6.5. Bulking of sand.
- 6.6. Advantages, disadvantages and applicability of different types and proportions of mortar and their suitability to different elements of building

7. Concrete

- 7.1. What is concrete and Different types of concrete
- 7.2. Concrete Mixes
- 7.3. Mixing, placing and uses of lime concrete and cement concrete.
- 7.4. Aggregate and its grading
- 7.5. Placing and compaction of concrete.
- 7.6. Curing of concrete.—reasons of curing and curing for different uses
- 7.7. Reinforced cement concrete.
 - Necessity of providing reinforcement.
 - Properties of R.C.C.
- 7.8. Advantages and disadvantages of different types and proportions of concrete and their suitability to different elements of building

1. Masonry (3 weeks)

- 1.1. Exercises on handling of bricks, cement, sand and aggregate
- 1.2. Exercises on preparation of mortar
- 1.3. Exercises on laying of bricks in various bonds.
- 1.4. Exercises on pointing and finishing

2. Painting and Polishing Shop (4 weeks)

- 2.1. Exercises in preparation of surfaces before painting
- 2.2. Exercises in application of primer coat
- 2.3. Exercises in polishing wood items
- 2.4. Exercises in painting wooden and steel items

3. Carpentry (1 week)

- 3.1 Demonstration exercises on woodwork
Sawing, Planing, Joining of wood

4. Introduction to model making (5 weeks)

- 4.1. Exercise in development and preparation of simple 3D geometric shapes such as cube, pyramid etc in card board and mount board

Trigonometry: (25%)

- 1.1 Measurement of angles in degree and radian and their conversion.
- 1.2 Trigonometrical ratios and their relations, ratios of allied angles (without proof),
- 1.3 Sum and differences formulae and their applications,
- 1.4 Product formulae, from product to sum difference and vice versa,
- 1.5 Multiple and sub multiple angles ($2A, A/2$).

Matrices: (25%)

- 2.1 Definition and types of matrices, addition, subtraction, and multiplication of matrices,
- 2.2 Inverse of a 3×3 matrix by adjoint matrix method,
- 2.3 Solution of linear equations containing upto 3 unknown only.

Co-ordinate Geometry: (25%)

- 3.1. Point- Cartesian and polar co-ordinates and their conversion, distance between two points, internal and external division formula, co-ordinates of centroid, in center and circum-centre, conditions of co-linearity of points.
- 3.2. Straight line- Equation of a straight line in various standard forms, angle b/w straight lines, perpendicular distance formulae.
- 3.3. Circle- Equation of circle in standard and general form, finding the equation of circle when its centre and radius are given & when any 3 points on it are given.
- 3.4. Conics – Definition of conics, parabola, ellipse and hyperbola and their standard equation. Finding the equation of parabola when its focus and directrix or focus and vertices are given, finding the equation of an ellipse or hyperbola when focus, directrix and eccentricity are given. Given the standard equation of conic to find its focus, directrix, vertex, axis, eccentricity and the length of latus rectums.

Differential calculus (25%)**4.1. Limits and functions:**

Concept of a function, its value and limit.

4.2 Evaluation of limits- four standard limits only, namely :

Lt	$\frac{\sin X}{X}$	Lt	$(1+X)^{1/X}$
$X \rightarrow 0$	X	$X \rightarrow 0$	

Lt	$\frac{X^n - a^n}{X - a}$	Lt	$\frac{a^X - 1}{X}$
$X \rightarrow 0$		$X \rightarrow 0$	

4.3 Differentiation:

- Definition, its physical meaning as rate measure and its geometrical meaning
- Differentiation from first principal of X^n , e^x , $\log a^x$, $\sin X$, $\cos X$, $\tan X$ only.
- Differentiation of $\cot X$, $\sec X$, $\operatorname{cosec} X$ and of inverse ratio.
- Differentiation of sum, product and quotient of functions.
- Differentiation of function of a function.
- Logarithmic differentiation.

1. Prose Text Book (30%)

- A prose textbook of 150 pages well illustrated. It should contain roughly though not necessarily biographies of two engineers and scientists, biographies of two great men (one religious leader and one national leader), two literary short stories, two humorous short stories, one short story of the type of science fiction; one essay. This text-book shall be officially prescribed.

2. Terminology (10%)

- Common terms administrative and technical, (along with their Hindi equivalent) from a prescribed list. Foreign students or those who do not know Hindi may be asked to explain the terms in English

3. Grammar (40%)

- A brief review of easy forms of tenses (past indefinite, past continuous past perfect, past perfect continuous, present indefinite, present continuous, present perfect, present perfect continuous, future indefinite). Conversion of direct narration into indirect form of narration and vice versa (only simple sentences).
- Punctuation.

4. Essay (20%)

- Preferably on scientific topic from the given outlines. Paper settlers may be instructed to give a choice of attempting one out of three topics. The question paper shall provide the outlines. The essay will be of 250 to 300 words. The examiner may select three topics one from each of the following fields
 - Science
 - Technology
 - General

5. Practice of speaking in English Language by Organizing; (Not for examination)

- Paper reading contests
- Student should present their drawings done in any subject to the entire class to develop public speaking confidence

DETAIL CONTENTS

1. Units of measurement in SI system Dimensions and use of dimensional analysis.
2. Force and motion –Newton's Laws. Conservation of momentum, work and energy, Forms of energy, conservation of energy, stress ,strain ,elastic modulus
3. Spring mass system. Vibrations of bodies; amplitude, frequency and energy of vibrations; free and forced vibration, resonance, vibration of structural members.
4. Temperature and its measurement. Liquid in glass thermometer.
5. Expansions of solids, thermal stresses; specific heat and heat capacity and concept of thermal time lag in buildings, laws of thermodynamics, principles of heat engines and refrigeration and air-conditioning system. Humidity and its control.
6. Acoustics of building and simple calculation of reverberation time, principles of acoustical modelling, sources of sound.
7. Light as waves, solar energy, solar cells and green house effects, colour-primary colours, colour mixing. Radiant light flux, luminous intensity, illumination, light efficiencies, standards of illumination.
8. Electromagnetic waves, infrared and ultraviolet rays, coated glasses and their characteristics.
9. Electrical nature of matter, molecular forces-cohesive and adhesive forces, application to water-proofing.

1. Introduction to computer

- 1.1. Block diagram of a computer and overview of its working.
- 1.2. Basic concept in stored program execution.
- 1.3. Input, output and secondary storage device.
- 1.4. Concept of RAM (read access memory), ROM (read only memory).
- 1.5. Introduction to operating system.
- 1.6. Types of computer- Micro (PC, PC-XT, PC-AT), Mini, Tablets Main Frame and super computers-their capabilities.

2. Word processing working on the computer to develop practice to use a word processing programme such as MS word etc.

- 2.1 Opening a document.
- 2.2 Preparing a document.
- 2.3 Editing a document.
- 2.4 Formatting a document.
- 2.5 Character, word and line editing.
- 2.6 Margin setting, paragraph alignment and setting.
- 2.7 Block operation.
- 2.8 Spell checker.
- 2.9 Saving document.
- 2.10 Applying print control.

3. Printing a document on any available printer.**4. Typing on a computer.**