

# **FACULTY OF ARCHITECTURE & EKISTICS**

## **Syllabus for B.Arch Program**



## **JAMIA MILLIA ISLAMIA**

(A Central University established by an Act of Parliament)

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## **ADMISSION**

Jamia Millia Islamia is offering a 5-year degree course leading to Bachelor of Architecture. The course is duly approved by the Council of Architecture (COA) / All India Council for Technical Education. (AICTE)

### **1.0 ELIGIBILITY FOR ADMISSION**

1.1 A candidate who has passed 10+2 Examination and has secured not less than 50% marks in aggregate with Mathematics, English, Physics, and Chemistry as subjects shall be eligible for admission to first year of the B. Arch Course, subject to an Aptitude Test.

Or

1.2 3-year Diploma (10+3), with Mathematics as a compulsory subject, recognised by Central/State government provided the candidate passed the Diploma with 50% marks in aggregate

### **2.0 MODE FOR ADMISSION**

The admission to this course will be made on the basis of merit

#### **a) Entrance Test**

The qualifying Entrance test will comprise of one objective type paper of 2 Hours duration and of 70 marks in Physics, Chemistry and Mathematics.

#### **b) Aptitude Test**

The examination will comprise of an Aptitude test paper of 3 Hours duration and 100 marks.

# **JAMIAMILLIAISLAMIA**

## **NEWDELHI**

### **Examination Rules And Ordinances**

Bachelor of Architecture Program

(Approved in the Academic Council Meeting held on 5<sup>th</sup> July 2005)

#### **1.0 CURRICULUM**

- 1.1 The entire curriculum of five years will be divided into Two STAGES, first Three years will constitute STAGE-I devoted to Basic Course and next Two years will constitute STAGE-II.
- 1.2 The First term of the Fifth year will be dedicated to Thesis and teaching of Professional Practices and one elective, and the Second term of the Fifth year will be devoted to Practical Training in established and recognized professional organizations as approved by the HEAD of Department of Architecture.

#### **2.0 DURATION**

- 2.1 Duration of the undergraduate program leading to the award of Bachelor of Architecture (B. Arch) shall be of five years with each academic year comprising of the two terms of 16 teaching weeks each.
- 2.2 A student failing twice in first year and ineligible for the carry over system (Clause 8) shall not be permitted to continue further.
- 2.3 A student shall be required to pass STAGE-I within FIVE years and the full course within a maximum period of Eight years from the time of his admission. If a candidate, at any stage is found to be unable to complete his full course of Five years in the stipulated period of Eight years, shall not be allowed to continue any further.

#### **3.0 ATTENDANCE**

- 3.1 Each student is normally required to attend all the lectures, tutorials and, the studio classes in every subject, as also the curricular and co-curricular activities. However, attendance of 75% will be necessary.

3.2 A student who fails to achieve the minimum prescribed attendance as per the provisions of the Clause-3.1 shall not be allowed to appear at the examinations and shall be deemed detained.

#### 4.0 QUALIFYING STANDARDS

4.1 **Sessionals:** A student shall be required to obtain minimum 50% of allotted maximum marks for the 'Sessional' in each subject including Dissertation / Thesis. The provision of grace marks shall not be invoked to enable a student to pass in the Sessional.

4.2 **Theory:** A student shall be required to obtain a minimum of 45% of the allotted maximum marks for the Theory of a subject to pass in that subject. For such a subject where, Viva-voce is also conducted in addition to Theory Examination, the combined minimum pass marks of Theory and Viva-voce examination shall be 45% of maximum marks allotted.

4.3 **Viva-Voce:** A student shall be required to obtain a minimum of 50% of allotted maximum marks for the Practical/ Viva-Voce' to pass in that subject. Similarly, 50% of allotted maximum marks will be required to pass Thesis Jury. The provision of the Grace Marks shall not be invoked to enable a student to pass in the 'Practical / Viva- Voce' of any subject.

4.4 **Aggregate:** A student will be required to obtain a minimum of 50% marks in aggregate of the Sessionals, Theory Examination, Viva-Voce and General Proficiency in each year to pass the examination.

Type of Assessment	Minimum Marks Required
Internal Assessment (Sessional)	50%
Viva Voce / Thesis Jury	50%
Theory Examination	45%
Theory Examination with Viva Voce	45%
Aggregate	50%

## **5.0 EXAMINATION**

- 5.1 A Student's performance will be evaluated for the 'SESSIONAL' through continuous assessment in the form of Class-Tests, Assignments, and Viva-Voce / Practical etc. A 'YEARLY EXAMINATION' shall be held at the end of each year for all the subjects by means of Theory Papers, Practical, Viva-Voce and Dissertation / Thesis or by means of any combination of these methods.
- 5.2 The distribution of marks for the Sessionals, Theory, Practical, Viva- Voce, and Dissertation / Thesis shall be as per the prescribed 'Scheme of Teaching and Examination.'
- 5.3 The maximum marks for each subject shall consist of marks allotted for 'Yearly Examination' and 'Sessional Work'.
- 5.4 Student who has passed in the internal assessment (Sessional) only shall be permitted to appear in the Final Examination of the respective year.

## **6.0 SPECIAL BACK PAPER EXAMINATION / IMPROVEMENT**

- 6.1 A student who does not satisfy the qualifying standards prescribed in Clause-5 above, can be awarded 'Grace marks' not exceeding a maximum limit of 03 marks, which may be distributed among any number of subjects in a single examination.
- 6.2 Special Back Paper Examinations be held for clearing the Back Papers of Stage-I and Stage -II after one month of the declaration of the result of Third year and Fifth year respectively.
- 6.3 Student may improve the aggregate / marks of the subjects, they have passed with Grace Marks / Low percentage, by reappearing in the same paper in the subsequent examination of the next year. Improvement examination will be limited up to four paper of one class.

## **7.0 PROMOTION RULES**

- 7.1 A student satisfying all the standards as provided in Clause-5 herein

above shall be declared to have 'Passed' the academic year and promoted to the next year.

7.2 A student not satisfying all the criteria of qualifying standards of Clause- 5, and has invoked the provisions of Clause-6.1, shall be declared as 'PASS with Grace Marks' (PGM) and shall be promoted to the next year.

7.3 A student not satisfying all the criteria of qualifying standards of Clause- 5, even in conjunction with the provisions of Clause- 6 (grace marks), but failing in not more than 04 subjects of a class shall be declared to have been 'Promoted with Carry Over Papers' (PCP) and, will be governed by Clause- 8.

A student so declared as (PCP) will have to clear the carry over papers, as and when the respective examination is held next year.

7.4 Students who are not covered by provisions of Clause- 7.1 to 7.3 shall be declared to have 'Failed'. Such students will be required to repeat the said year, either as a regular student or as 'ex-student', in accordance with Clause- 9.

#### **8.0 PROMOTION UNDER CARRY OVER SYSTEM**

8.1 A candidate covered under Clause- 7.2 shall become eligible for provisional promotion to the next higher class of the course and, shall get chance to clear the said 'Carry Over Papers' in the next examination of the concerned year, under a 'Carry-Over System'.

8.2 A candidate shall not be promoted to Fourth year unless he passes all the examinations of First, Second and Third year.

8.3 Marks obtained by a student to clear a carry over paper shall replace the original marks.

#### **9.0 EX-STUDENTSHIP**

9.1 A student opting to clear a examinations as an ex-student shall be required to inform the Dean / Head of the Department in writing, within 15 days of start of the next academic session.

9.2 An ex-student shall be required to appear at the 'Theory' and 'Practical/Viva-Voce' examination of all the subjects, of the

concerned class. However, the marks, for the 'Sessionals' of all the subjects and 'General Proficiency' in the earlier regular attempt, shall be retained as obtained by him.

- 9.3 If a student opts to repeat the academic year, as a Regular Student, the new marks awarded to him for 'Sessionals' and 'General Proficiency' will replace the old marks obtained by him in the earlier attempt.

## 10.0 RESULTS

- 10.1 The examination result of a student for the year shall be declared to indicate his performance and carry over papers / Grace Marks to indicate the status of his promotion to the next higher class.
- 10.2 For the award of merit / scholarship, all such students who have been declared as Promoted with Grace Marks or Provisionally Promoted with Carry Over Papers will be excluded.
- 10.3 The 'Final Result' for the award of degree shall be prepared on the basis of the cumulative performance of student by computing the marks with weightage to marks obtained by him in each year, as noted in the following table-

<b>Class</b>	<b>Total Marks</b>	<b>Percentage Value</b>	<b>Numerical Value</b>
First Year	2000	10	200
Second Year	2000	10	200
Third Year	2000	20	400
Fourth Year	2000	30	600
Five Year	2000	30	600
<b>Grand Total</b>	<b>10000</b>	<b>100</b>	<b>2000</b>

## 11.0 AWARD OF DIVISION

- 11.1 The division to a student will be awarded on the basis of final result of Five years computed in accordance with weightage given in Ordinance- 10.3 at the end of the final year.
- 11.2 A student securing 75% or more in the Final result will be graded as First Division with Honours provided he has cleared all classes in

the first attempt without invoking the grace Marks.

- 11.3 A student will be said to have secured the 'First Division' who has obtained 60% or more marks in the 'Final' result.
- 11.4 A student will be said to have secured the 'Second Division' who has passed the examination of all the classes and obtained the minimum qualifying marks but has secured less than 60% marks in the 'Final' result.

## **12.0 AWARD OF GENERAL PROFICIENCY MARKS**

- 12.1 The marks for 'General Proficiency' will be awarded, by the HEAD of Department of Architecture in consultation with the Course Coordinator, keeping in consideration the performance of a student in the co-curricular & extra curricular activities, general discipline in the following manner.
- (i) Co- curricular & Extra-curricular activities (Games, Sport, Cultural and Literary activities etc.)
  - (ii) Discipline (Inside and Outside Campus)
- 12.2 There is no minimum qualifying marks for 'General Proficiency'. However the marks awarded for General Proficiency will be added for the purpose of declaring result for each year.

## **13.0 PRACTICAL TRAINING**

- 13.1 During the Second Term of the Fifth year a student will be required to do a 'Practical Professional Training' for a period of not less than 16 weeks in a Architectural Firm of repute where a student can get the opportunity for sufficient exposure of field conditions to be able to enter the profession after graduation.
- 13.2 The Practical Training will commence during the Second Term of the Fifth Year after passing the Thesis Jury during the First Term of the Fifth Year.
- 13.3 Head of Department of Architecture will approve the Architectural Firm for the 'Practical Professional Training' for a student.
- 13.4 A student will be required to submit a performance report from the

Architect under whom Training was completed as well a detailed report on the work carried out by him during the training in a format prescribed by the Department of Architecture.

- 13.5 The marks for Practical training will be awarded to each student by the Head of the Department in consultation with the course coordinator,
- a. On the basis of the performance report from the Architect under whom the training was carried out.
  - b. On the assessment of the report of works rendered by the student during the training.

#### **14.0 THESIS EVALUATION**

- 14.1 On the commencement of the Fifth year the student shall submit two synopses for Thesis projects. HOD / Coordinator appointed by HOD will approve One out of the Two synopses, as well assign a Guide amongst the faculty members to each student which shall be evaluated by the panel of jury, where the student will be present to defend the Thesis presented by him. The supervisor of the student may be also present in the jury.
- 14.2 The jury shall include Five Members in all. Dean/Head will be the Chairman. Minimum three members shall be external and one internal member from the faculty, in addition to the chairman.
- 14.3 A student who fails in the Thesis evaluation will be allowed to resubmit the modified Thesis after a minimum period of Three month with due approval of the Head of the Department.

#### **15.0 USE OF UNFAIR MEANS IN EXAMINATION**

The cases of students using 'Unfair means' at the examinations shall be dealt in accordance with the Provisions of Ordinance- XV (Clause 31)

#### Abbreviations

AC	:	Academic Council of Jamia Millia Islamia
AICTE	:	All India Council of Technical Education
B.Arch.	:	Bachelor of Architecture
COA	:	Council of Architecture
JMI	:	Jamia Millia Islamia, New Delhi.
Ordinance	:	Ordinances for the B.Arch Program of JMI.

# DEPARTMENT OF ARCHITECTURE

JAMIA MILLIA ISLAMIA

## BACHELOR OF ARCHITECTURE

### SCHEME OF EXAMINATION

#### YEAR 1

CODE	SUBJECT	CLASSES		MARKS				EXAM
		L	T/ST	IA	WR	VV	TOT	HOURS
AR 101	ARCHITECTURAL DESIGN-I	1	5	300	150	150	<b>600</b>	6
AR 102	BUILDING CONSTRUCTION -I	1	2	150	75	75	<b>300</b>	3
AR 103	BUILDING MATERIALS & SCIENCES	2	-	50	50	-	<b>100</b>	3
AR 104	ARCHITECTURAL DRAWING-I	1	5	125	75	50	<b>250</b>	3
AR 105	WORKSHOP PRACTICES -I **	-	4	50	-	50	<b>100</b>	-
AR 106	THEORY OF STRUCTURES -I	3	-	50	50	-	<b>100</b>	3
AR 107	SURVEY AND LEVELLING *	1	3	50	-	50	<b>100</b>	
AR 108	VISUAL COMMUNICATION SKILLS *	1	1	50	-	50	<b>100</b>	-
AR 109	COMPUTER APPLICATIONS -I	-	1	50	-	50	<b>100</b>	
AR 110	DISSERTATION: INDIAN ARTS & CRAFTS **	2	-	50	-	50	<b>100</b>	-
AR 111	ARTS AND GRAPHICS-I	1	2	50	50	-	<b>100</b>	3
GENERAL PROFICIENCY		-	-	-	-	-	<b>50</b>	-
<b>TOTAL</b>		-	-	<b>975</b>	<b>500</b>	<b>475</b>	<b>2000</b>	<b>21</b>

#### NOTATIONS:

L-LECTURES

T- TUTORIALS

ST-STUDIO

IA-INTERNAL ASSESMENT

WR-WRITTEN EXAM

VV-VIVA VOCE

#### NOTE:

Each session will be of 2 terms of 16 teaching weeks each.

Number of Classes per week = 30 (in each term).

Subjects with \* against them will be taught only for one term in TERM I.

Subjects with \*\* against them will be taught only for one term in TERM 2.

Exams will be held after 32 weeks of teaching (excluding exams) in each academic year.

**DEPARTMENT OF ARCHITECTURE**  
**JAMIA MILLIA ISLAMIA**

**BACHELOR OF ARCHITECTURE**  
**SCHEME OF EXAMINATION**

**YEAR 2**

CODE	SUBJECT	CLASSES		MARKS				EXAM
		L	T/ST	IA	WR	VV	TOT	HOURS
AR 201	ARCHITECTURAL DESIGN-II	1	5	300	150	150	<b>600</b>	12
AR 202	BUILDING CONSTRUCTION - II	1	3	150	75	75	<b>300</b>	3
AR 203	HISTORY OF ARCHITECTURE -I	2	-	50	50	-	<b>100</b>	3
AR 204	ARCHITECTURAL DRAWING-II	1	5	100	50	50	<b>200</b>	3
AR 205	WORKSHOP PRACTICES - II	-	2	50	-	50	<b>100</b>	-
AR 206	THEORY OF STRUCTURES - II	3	-	75	75	-	<b>150</b>	3
AR 207	BUILDING SERVICES -I	1	-	50	50	-	<b>100</b>	3
AR 208	VIRTUAL ARCHITECTURE -I **	2	-	50	-	50	<b>100</b>	-
AR 209	COMPUTER APPLICATIONS -II	1	1	50		50	<b>100</b>	-
AR 210	DISSERTATION: INDIAN ARCHITECTURE **	2	-	50	-	50	<b>100</b>	-
AR 211	ARTS AND GRAPHICS -11 *	1	3	50	50	-	<b>100</b>	3
	GENERAL PROFICIENCY	-	-	-	-	-	<b>50</b>	-
<b>TOTAL</b>		-	-	<b>975</b>	<b>500</b>	<b>475</b>	<b>2000</b>	<b>30</b>

NOTATIONS:

L-LECTURES

T- TUTORIALS

ST-STUDIO

IA-INTERNAL ASSESMENT

WR-WRITTEN EXAM

VV-VIVA VOCE

**NOTE:**

Each session will be of 2 terms of 16 teaching weeks each.

Number of Classes per week = 30 (in each term).

Subjects with \* against them will be taught only for one term in TERM I.

Subjects with \*\* against them will be taught only for one term in TERM 2.

Exams will be held after 32 weeks of teaching (excluding exams) in each academic year.

# DEPARTMENT OF ARCHITECTURE

## JAMIA MILLIA ISLAMIA

### BACHELOR OF ARCHITECTURE SCHEME OF EXAMINATION

#### YEAR 3

CODE	SUBJECT	CLASSES		MARKS				EXAM
		L	T/ST	IA	WR	VV	TOT	HOURS
AR 301	ARCHITECTURAL DESIGN-III	2	6	300	150	150	<b>600</b>	18
AR 302	BUILDING CONSTRUCTION -III	1	4	150	75	75	<b>300</b>	6
AR 303	HISTORY OF ARCHITECTURE -II	2	-	75	75	-	<b>150</b>	3
AR 304	PRINCIPLES OF HUMAN SETTLEMENT	2	-	50	50	-	<b>100</b>	3
AR 305	ESTIMATION AND COSTING	2	-	75	75	-	<b>150</b>	3
AR 306	THEORY OF STRUCTURES -III	4	-	75	75	-	<b>150</b>	3
AR 307	BUILDING SERVICES - II	2	-	75	75	-	<b>150</b>	3
AR 308	VIRTUAL ARCHITECTURE - II*	2	-	50	-	50	<b>100</b>	-
AR 309	COMPUTER APPLICATIONS -III	1	2	75	-	75	<b>150</b>	-
AR 310	DISSERTATION: INDIAN ARCHITECTS **	2	-	50	-	50	<b>100</b>	-
GENERAL PROFICIENCY		-	-	-	-	-	<b>50</b>	-
<b>TOTAL</b>		.	.	<b>975</b>	<b>575</b>	<b>400</b>	<b>2000</b>	<b>39</b>

#### NOTATIONS:

L-LECTURES

T- TUTORIALS

ST-STUDIO

IA-INTERNAL ASSESMENT

WR-WRITTEN EXAM

VV-VIVA VOCE

#### NOTE:

Each session will be of 2 terms of 16 teaching weeks each.

Number of Classes per week = 30 (in each term).

Subjects with \* against them will be taught only for one term in TERM I.

Subjects with \*\* against them will be taught only for one term in TERM 2.

Exams will be held after 32 weeks of teaching (excluding exams) in each academic year.

# DEPARTMENT OF ARCHITECTURE

## JAMIA MILLIA ISLAMIA

### BACHELOR OF ARCHITECTURE SCHEME OF EXAMINATION

#### YEAR 4

CODE	SUBJECT	CLASSES		MARKS				EXAM
		L	T/ST	IA	WR	VV	TOT	HOURS
AR 401	ARCHITECTURAL DESIGN-IV	2	6	300	150	150	<b>600</b>	18
AR 402	BUILDING CONSTRUCTION -IV	1	5	200	100	100	<b>400</b>	6
AR 403	ELECTIVE-I	1	-	50	-	50	<b>100</b>	3
AR 404	TOWN PLANNING	2	-	50	50	-	<b>100</b>	3
AR405	LANDSCAPE	2	-	50	-	50	<b>100</b>	-
AR 406	THEORY OF STRUCTURES -IV *	3	-	50	-	50	<b>100</b>	-
AR 407	BUILDING SERVICES-III	2	-	50	50	-	<b>100</b>	3
AR 408	HUMANITIES	2	-	50	50	-	<b>100</b>	3
AR 409	BUILDING BYE LAWS **	1	-	25	25	-	<b>50</b>	3
AR 410	SEMINAR: INDIAN HABITAT**	2	-	50	-	50	<b>100</b>	-
AR 411	INTERIOR DESIGN	1	1	50	-	50	<b>100</b>	-
AR 412	MANAGEMENT	2	-	50	50	-	<b>100</b>	3
GENERAL PROFICIENCY		-	-	-	-	-	<b>50</b>	-
<b>TOTAL</b>		-	.	<b>975</b>	<b>475</b>	<b>500</b>	<b>2000</b>	<b>45</b>

#### NOTATIONS:

L-LECTURES

T- TUTORIALS

ST-STUDIO

IA-INTERNAL ASSESMENT

WR-WRITTEN EXAM

VV-VIVA VOCE

Each session will be of 2 terms of 16 teaching weeks each.

Number of Classes per week = 30 (in each term).

Subjects with \* against them will be taught only for one term in TERM I.

Subjects with \*\* against them will be taught only for one term in TERM 2.

Exams will be held after 32 weeks of teaching (excluding exams) in each academic year.

**DEPARTMENT OF ARCHITECTURE**  
**JAMIA MILLIA ISLAMIA**

**BACHELOR OF ARCHITECTURE**  
**SCHEME OF EXAMINATION**

**YEAR 5**

CODE	SUBJECT	CLASSES		MARKS				EXAM
		L	T/ST	IA	WR	VV	TOT	HOURS
AR 501	THESIS*	5	15	600	-	600	1200	-
AR 502	PROFESSIONAL PRACTICE**	6	-	50	50	-	100	3
AR 503	ELECTIVE - II**	4	-	50	-	50	100	-
AR 504	TRAINING ***	-	-	275	-	275	550	-
	GENERAL PROFICIENCY	-	-	-	-	-	50	-
<b>TOTAL</b>		-	-	<b>975</b>	<b>50</b>	<b>925</b>	<b>2000</b>	<b>3</b>

NOTATIONS:

L-LECTURES T- TUTORIALS

IA-INTERNAL ASSESMENT EXAM

WR-WRITTEN EXAM

ST-STUDIO

VV-VIVA VOCE

**NOTE:**

Number of Classes per week = 30 (in first term).

Each session will be of 2 terms of 16 weeks each.

The first session will be for teaching and the second session will be for practical training.

Exams will be held after 32 weeks of the academic session.

\* Thesis shall be completed in the first term of the fifth year. Assessment and Viva- Voce for the same shall be completed before the students proceed for Practical training in the second term.

\*\* Exam for these subjects will be conducted at the end of the academic year after the successful completion of Practical Training.

\*\*\* Students are expected to complete 16 weeks offull- time Practical Training with an architecture firm. Students will be awarded the credits for the same only after they submit a letter from the firm confirming the same and substantiate it with documentation of work done.

## AR 101: ARCHITECTURAL DESIGN - I

TEACHING HOURS			EXAMINATION MARKS			
L/TU	_ST	TOTAL	IA	WR	VV	TOTAL
1	5	6	300	150	150	600

### OBJECTIVES

- Orientation to the architectural profession with a focus on creating a mindset for the student towards the profession, its scope and demands.
- Sensitizing students to be more observant to their surroundings and promoting it as a basic creative instinct in the students.

### METHODOLOGY

- Orientation about the profession with the help of Audio/Video presentations.
- Studio lectures.
- Individual studio exercises and one group project (measured drawing).

### CONTENTS

#### TERM I

##### Introduction

Introduction to profession of architecture, and professional organizations like IIA, COA, AICTE, CAA, ARCASIA

##### Introduction to Design

Principles of design and elements of design.

Functionality of space and sequential function.

Exploration of patterns with 2 D compositions.

Exploration of form through 3 D compositions.

##### Study of Anthropometries

Exercises to increase perception and sensitivity of the students about space. This can be best understood through one or two short exercises in anthropometries. (Presentations should be made through simple sketches and drawings. Referencing of standards and conducting measurement of static and dynamic spaces and functionality)

Short exercises in design and layout of personal space, rooms etc.

## TERM 2

### **Measured Drawing**

A measured drawing of an existing / historic building and its features.

It would allow for students to learn working in a team, studying different aspects of the same building.

### **Design Exercise**

Short exercises in design such as Milk Booth,, tea stall, shelter in park, bus stop, Fuel Station etc( the emphasis should be on application of anthropometrics , analysis of activity and movement aimed at functionality)

Design exercises to be coupled with parallel drafting and drawing exercises to encourage use of the skills of isometric and axonometric, sciagraphy, perspective drawing and rendering techniques for opaque and transparent mediums. This aspect of the curriculum should proceed parallel to AR 104 - I.

## **AR 102: BUILDING CONSTRUCTION -I**

TEACHING HOURS			EXAMINATION MARKS			
L	TUST	TOTAL	IA	WR	VV	TOTAL
1	2	3	150	75	75	300

### **OBJECTIVE**

Introduction to elementary building construction methods and their applications.

### **METHODOLOGY**

- Introduction to materials and construction through lectures and studio exercises.
- Site visits to gain knowledge about construction details.
- Introduction to some basic construction methods and elements through exercises at the construction yard.

### **CONTENTS**

#### **TERM 1**

##### **Construction**

- Basic Tools: Introduction to Basic tools used by masons and carpenters.
- Elementary Carpentry: Different types of common joints.
- Brick Work: Terminology: Bricks, bats and closures
- Bonding: Types of bonds: English, Single and double Flemish
- Offset functions and quoins: right angled and angular quoins, tee and cross-junctions for various thickness, attach and other piers, coping.
- Corbelling, String courses and decorative brickwork.
- Stonework: Stone masonry, dressing, Random Rubble, Coursed Rubble, Ashlar.

##### **Materials**

- Bricks- specifications of bricks and types of bricks most commonly used.

## TERM 2

### **Construction**

- Foundations: Need for foundations, preliminary design criteria.  
Foundation brickwork and concrete.
- Detail of spread foundation for load bearing walls of various thicknesses.
- DPC: Laying of Horizontal D.P.C.
- Arches: Elementary principles of Arch construction. Definition of various technical terms and Types of Arches. Construction of Brick and Stone Arches.

### **Materials**

- Timber- seasoning of wood, types of wood used in construction.
- Identification of basic woods like teak, *sal*, *sheesham*, mango, eucalyptus etc.

## AR 103: BUILDING MATERIALS & SCIENCE

### TEACHING HOURS

L/TU ST TOTAL

2 0 2

### EXAMINATION MARKS

IA WR VV TOTAL

50 50 0 100

### OBJECTIVE

Introduction to elementary principles of building sciences.

The focus would be on bio-climatic behaviour of building materials with respect to human comfort in buildings.

### METHODOLOGY

- Lectures introducing various concepts of building sciences and materials.
- Studio assignments for understanding practical implications.
- Site visits to understand the use and behaviour of contemporary and old buildings

### CONTENTS

#### TERM1

##### **Introduction**

Basic building materials like lime, sand, brick, cement, grit, steel, stone etc.

##### **Importance of climate in architecture**

Factors affecting climate. Measurement and recording of elements of climate like solar radiation, temperature, wind, humidity, and precipitation.

Different types of climatic zones and their characteristics.

Macro and microclimate. Application of climatic principles for design of buildings in hot and dry, warm, humid, composite and tropical climates.

##### **Thermal behavior of buildings and materials:**

Study of body's heat production and heat loss.

Time lag of different materials for heat transfer.

Thermal comfort, effective temperature, bio-climatic analysis,  
Isopleths,

Direct and indirect insulation, Reflectivity and emissivity.

## TERM 2

### **Lighting**

Solar geometry and shading devices

Radiation gains on walls and roofing different directions.

Natural lighting, glare, daylight factor, effect of size and shape of openings in different planes. Design of buildings for daylight.

### **Wind**

Study of seasonal variations in wind and effect of topography.

Effect of wind on location of industrial area, airports and other land uses.

Requirements, size and position of openings, airflow patterns inside and outside buildings.

### **Site selection and site planning in relation to climatic factors**

Passive systems, evaporative and ground cooling.

Effect of trees and plants.

Understanding of constituents and properties of building materials and study of their properties with relation to climate.

# AR 104: ARCHITECTURAL DRAWING - I

## TEACHING HOURS

L/TU ST TOTAL

1 \_\_\_ 5 6

## EXAMINATION MARKS

IA \_ WR VV TOTAL

150 \_75 50 250

## OBJECTIVES

- Introduction and familiarization with drafting tools and accessories.
- To give basic knowledge of good drafting and lettering techniques.
- To develop comprehension and Visualization of geometric forms.

## METHODOLOGY

Studio assignments and lectures. Demonstration of 3D Geometrical objects and their 2D representation on sheets

## CONTENTS

### TERM I

#### Introduction

Drawing Instruments and their uses.

Sheet layout and sketching.

Lettering: - Exercises in drafted and freehand architectural lettering.

Lines: Concept and types of lines. Line thickness. Dimension lines.

#### Scales

Scales: Engineers scale, Graphical scale and Representation factor (R.F.)

Scales on drawings. Types of scales: Plain scale and Diagonal scale.

#### Orthographic Projections

Definition, Meaning & Concept. Principles and Methods of projection.

Orthographic projection. Planes of projection.

Four Quadrants. First Angle projection. Third Angle projection.

Projection of Points, Lines & Planes.

#### Development of Surfaces

Introduction and Methods of development of surfaces.

Development of lateral surfaces of right solids like Cubes, Prisms, Cylinders.

Method of drawing the development of the lateral surface of a pyramid & Cone.

## TERM 2

### **Projections of solids**

Axis perpendicular to the H.P. , Axis perpendicular to the VP.

Axis parallel to both the H.P. & VP.

Projection of solids- axis inclined to one reference plane and parallel to other.

Projections of solids with axis inclined to H.P. and VP.

### **Section Of Solids**

Section plans, Sections, True shape of a section.

Section of solids (Prisms, Pyramids, Cylinders, Cones, Spheres.)

### **Sciagraphy**

Introduction/ Meaning of sciagraphy

Projection of sciagraphy in plan and elevations.

## **AR 105: WORKSHOP PRACTICES - I**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
0	4	4	50	0	50	100

### **OBJECTIVE**

To equip students with the basic skills necessary to represent their ideas in a rudimentary model format using simple materials like paper, thermocol, hardwood, Metals, glass fibre etc.

### **METHODOLOGY**

Exercises in cutting, finishing and joinery etc. with simple blocks, composition of basic geometrical forms etc. Introduction to the various tools and equipment available for executing these exercises. The section on joinery details will be dealt with in an engineering lab.

### **CONTENTS**

#### **Joinery**

Simple joinery details in wood.

Pipes and sleeve joints.

Metal- welded joints, nut-bolt joints. Types of welded joints.

#### **Architectural Modelling**

General information about various materials and tools to be used in model making. Development of the skill to use the tools with precision to obtain desired results in model making.

#### **Introduction to types of model**

Block models, detailed model, construction model and interior models etc.

#### **Introduction to various materials**

Experimentation with these materials for different geometries and scales of models.

## **AR 106: THEORY OF STRUCTURES –I**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
3	0	3	50	50	0	100

### **OBJECTIVE**

To understand the basic principles of structural mechanics that would be pertinent to simple design elements. To also understand the structural behaviour of building elements.

### **METHODOLOGY**

Lectures and computation exercises.

### **CONTENTS**

#### TERM 1

##### **Types of stress and strain**

Stress – strain curve of mild steel, Proportionality limit, Elastic limit, Yield point, Hooke's Law, Modulus of Elasticity.

Composite bars, temperature stresses

Poisson's Ratio, Saint-Venant's Principle, Principal stresses and strains.

##### **Center of Gravity**

Center of Gravity of 2D objects and sections

##### **Moment of Inertia**

Moment of inertia of 2D objects and sections by first principle, Perpendicular and Parallel axis theorem, Section Modulus, Moment of Inertia of Composite sections.

##### **Elements of Statics**

Two dimensional force systems, Parallelogram Law of forces, Triangular forces, Polygon Law of forces. Resultant of concurrent and coplanar forces. Equation of Static Equilibrium, Moment and Couple.

Friction and coefficient of friction

##### **Shear force and Bending moment**

Introduction, Types of beams, support system and loadings

Shear Force and Bending Moment diagrams for simple cases (cantilever, simply supported and overhang beams) under concentrated and uniformly distributed load, point of contra-flexure.

TERM 2

**Analysis of 2D Pin Jointed Trusses**

Method of joints

Method of sections

**Stresses in beam section**

**Bending Stresses:** Bending stress equation, Bending stresses in symmetrical and unsymmetrical sections

**Shear Stress:** Shear stress equation, Shear stress distribution in circular and rectangular sections. Shear stress profile of various sections.

**Column and Struts**

Introduction, types of columns, End conditions, Effective length, Slenderness ratio, Ultimate load capacity by Euler's formula

## **AR 107: SURVEY AND LEVELLING**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
1	3	4	50	0	50	100

### **OBJECTIVES**

- To illustrate the role of Surveying and Levelling in Architecture
- Introduction to the Tools and equipment for Land Surveying.

### **METHODOLOGY**

Lectures and Practical exercises involving fieldwork and working with survey equipments.

### **CONTENTS**

#### **Introduction**

Introduction to surveying, understanding land topography and its relevance in Architecture.

Types of surveys in practice

Introduction to survey equipments.

#### **Chain Surveying**

Principles of survey, equipment required, selection of station, methods of taking offsets. Booking the field notes, obstacles in chaining, errors in chaining, chaining on sloping ground and reciprocal ranging.

#### **Compass Surveying**

The prismatic compass, its construction and uses. Other types of compasses.

Reduced and whole circle bearing, magnetic declination, effects of local attraction. Compass traverse and balancing the closing error.

#### **Levelling**

Different types of levels, their temporary and permanent adjustment, levelling staff. Book of the readings and reduction of levels. Errors in levelling.

Curvature and refraction reciprocal levelling profile, levelling cross sections.

#### **Plane Tabling**

Equipment and methods. Two points and three points problems.

**Contouring**

Characteristics of contour lines, direct and indirect methods of contouring and interpolation of contours. Interpretation and preparation of contour maps. Site modelling with total station. Exercises in setting out of building works.

**Theodolite Surveying**

Theodolite, its temporary and permanent adjustment, measuring of magnetic bearings, horizontal and vertical angles. Theodolite traverse and balancing the closing error.

**Tachometric Surveying**

General instruments, different systems of Tacheometric measurements, stadia method, Subtense method.

## **AR 108: VISUAL COMMUNICATION SKILLS**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	W	TOTAL
1	1	2	50	0	50	100

### **OBJECTIVES**

- Attuning students to a pictorial understanding of spaces.
- Exploring methods of presentation for design through photographs.
- Understanding the language and aesthetics of photography, as an inter-disciplinary art form and its relevance in architectural communication.
- Brainstorming on ideas of representing spaces through photographs.

### **METHODOLOGY**

- Lecture and post lecture discussions.
- Practical assignments and student presentations.
- Presentation by students on different themes.

### **CONTENTS**

#### **Introduction to Devices**

- Introduction to devices used for visual communication.
- Introduction to different types of cameras, (still and moving), optical and magnetic, their parts and their use.

#### **Communication Graphics**

- Introduction to the elements, principles, and techniques that underlie and inform the analysis, creation, and evaluation of visual organizations and are crucial to the process and product of form-making.
- Translation of concept into form using word, image, and layout.
- Typography
- Presentation of Designs through photographs, understanding the language and aesthetics of photography, as an inter-disciplinary art form and its relevance in modern architecture.

**Photographic studies**

A practical introduction to the theory and application of cameras, metering devices and lighting

Studio and darkroom techniques, developing a print and processing.

Using digital cameras.

Mounting of photographs.

Slide presentation.

## **AR 109: COMPUTER APPLICATIONS - I**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
0	1	1	50	0	50	100

### **OBJECTIVES**

- General Historical background of computer development.
- Brief description of various Hardware and Software.
- Basic knowledge of different operating systems i.e. Windows, Unix, Linux etc.

### **METHODOLOGY**

Brief lectures followed by application in individual lab exercises.

### **CONTENTS**

#### TERM 1

Introduction of various software available for documentation, presentation & drawing purposes.

Familiarizing the use of scanners, printers plotters etc.  
Introduction of Auto CAD as drafting tool.

#### TERM2

Applications of M.S. Office in presentation:

Microsoft Word

Microsoft Power Point

Microsoft Excel

Adobe Page Maker

## **AR 110: DISSERTATION - INDIAN ARTS & CRAFTS**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
2	0	2	50	0	50	100

### **OBJECTIVES**

- To stimulate art appreciation and development of aesthetic sense.
- To introduce vernacular art and craft forms.
- To introduce a sense of exploration, research and documentation.

### **METHODOLOGY**

After orientation classes and lectures, the student must submit to the concerned teacher the synopsis of one research project for approval. Each student is expected to complete and submit a report (20-25 pages) based on the research conducted. Classes are to be used for introductory lectures, site visits, interviews and library work.

### **SCOPE OF STUDY**

Study a particular Art / Craft form belonging to a specific region / period or a school of thought in India. Students have the flexibility to choose from a wide range of topics that may be historic or contemporary.

### **CONTENTS**

- Study the different styles of Report Writing – APA Style, Chicago Style etc.
- Referencing and bibliography
- Footnotes and citations

## AR 111: ARTS AND GRAPHICS – I

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
1	2	3	50	50	0	100

### OBJECTIVES

- To develop a sense of composition and design.
- To introduce the relevance of art and appreciation of fine arts in architecture.
- To develop basic (freehand) visual communication skills.

### METHODOLOGY

- Brief lectures and studio exercises
- Nature studies through sketching and water color exercises.
- Visits to art galleries and museums.

### CONTENTS

#### Theory

Brief introduction of art in terms of architecture.

Basic elements of composition and design.

Color theory: Primary Colors, Secondary Colors, hue, intensity, value, Harmonious and Contrast Colors.

Appreciating a piece of art on the basis of aesthetic value.

#### Practical

Exercises based on basic shapes- triangle, circle and square.

Brief introduction of color theory and exercises based on the theory.

Exercises related with the patterns of nature and compose them graphically.

Exercises based on the concept and elements of Design.

Exercises in collage to develop an understanding of the relationship between different shapes, colors, overlapping and grouping etc.

Sketching: rapid sketches from daily life (10 sketches per week)

Nature studies with pencil, ink and water colors.

Application of Arts and Graphics in the exercises conducted in Architectural design (AR101)

## AR 201: ARCHITECTURAL DESIGN -II

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
1	5	6	300	150	150	600

### OBJECTIVES

- To foster understanding about land and landforms and the elements of built space. Experimentation with shapes and forms to evolve sensitivity to built volumes.
- Focus on studying patterns in horizontal circulation in built areas.
- Introduction to vernacular architecture, use of local materials and appreciation of the socio-economics of the users.

### METHODOLOGY

- Site analysis at the beginning of each design problem. This would develop sensitivity to existing site conditions and context and help students evolve design directives to guide the design process.
- Block models at every design stage for three-dimensional visualization.

### CONTENTS

#### TER M 1

#### **Design projects related to different climatic conditions (4 week duration)**

The projects would address the study of built form and its relationship to the site, surroundings and climatic setting. Design proposals to address sensitivity to climatic and physical settings. The design problem would induce students to experiment with built and open spaces.

#### **Seminar**

These presentations would highlight national and international design projects to give the students a visual experience about interior and exterior space planning and increase their awareness about the contemporary world of architecture. The research would be done over the winter break

and the presentations would be made in the first two weeks of the second term while the design problem is being introduced.

## TERM 2

### **One complex design problem (12 week duration)**

The project would involve the study of simple repetitive type of spaces like schools, hostels, shops and offices. The focus would be on the evolution of form through a detailed site analysis. Other design issues that the problem must address are:

- Detailing of selected areas to introduce a working understanding of services.
- Integration of design ideas with structural feasibility.
- Evolving working solutions for parking and circulation patterns.

### **Two short time problems (1 week duration each)**

Design exercises could be free standing structures like war memorial etc.

## AR 202: BUILDING CONSTRUCTION-II

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
1	3	4	150	75	75	300

### OBJECTIVE

To introduce construction principles and materials used for the basic elements of a building like doors, windows, stairs etc.

### METHODOLOGY

- Lectures and Studio assignments for understanding construction details.
- Site visits and library studies to supplement the studio work regarding materials and construction methods.
- Application of Materials and construction techniques listed below in the design exercises conducted in Architectural design (AR201)

### CONTENTS

#### TERM1

##### Construction

- Doors: Types of doors, construction techniques, decorative panel doors, glazed doors, flush doors, doors with fanlight, and calculation of woodwork.
- Windows: Detail of timber frames & shutters, fixed shutters, Calculation of woodwork.
- Roofs and Trusses: Timber roofs: lean to roof, closed couple roof, collar roof for small spans. Large timber trusses (12 meter span).

##### Materials

- Glass and glass products: Plain, sheet, plate, textured, laminated, wired and shock resistant glass. Glass blocks, glass tiles, mirrors, heat reflecting glasses and Glass wool.
- Plastics, Nylon, PVC, Bakelite, Polythene, glass fiber reinforced plastic.
- Paints and surface finishes: Composition, properties and methods of application of different types of paints: Oil, synthetic enamels, acrylic and other plastic emulsions and formulations, interior and exterior grade paints. Cement based paints.

## TERM 2

### **Construction**

- Pitched bamboo & timber roofs.
- Staircases: Design and details of construction of staircases in timber, stone and RCC. Different types of staircases-Dog legged, Circular, Open Well, Spiral etc.
- Lift well details.
- Partitions: Construction of partition in timber and timber products, gypsum boards etc. for use in offices and restaurants.

### **Materials**

- Varnishes: Natural and synthetic clear varnishes, French polish.
- Floor finishes: PCC, terrazzo, stone slabs, brick and terracotta tiles, Synthetic materials (PVC, Timber). Floors of industrial buildings & warehouses. Ceramic wall & floor tiles
- Roofing materials: Burnt clay tiles, slates, AC sheets, GI and Aluminium sheets.

## **AR 203: HISTORY OF ARCHITECTURE – I**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
2	0	2	50	50	0	100

### **OBJECTIVE**

Introduction to the architecture of the ancient world. To generate an understanding about the development of civilization and its architectural implications.

### **METHODOLOGY**

Visually intensive lectures using power point presentations to acquaint students with historic sites and buildings. Site visits and seminar presentations and model making

### **CONTENTS**

#### TERM 1

#### **Civilizations of the Ancient Western World**

- Growth of early civilizations from Stone Age to Neolithic settlements in Europe. Examples - Carnes, Stonehenge etc.
- Egyptian: Early tomb architecture and later temple architecture, great pyramids of Giza, Mastabas, Funerary temples and later temples like Khons etc.
- Mesopotamia: Cities of Mesopotamia like Ninveh, Khorsabad and Babylon.
- Greek: Hellenistic period, classical orders, temples and public buildings, geometry and symmetry in their buildings, Acropolis, Agora, temples, tombs and house forms.
- Roman: Construction systems using vaults and domes. Building types like temples, forums, basilica, theatres, aqua ducts, bridges, roads, sewage system and fountains.
- Early Christian: Basilican churches, centralized and longitudinal churches, interiors and articulation of the churches, pictures and biblical scenes.
- Byzantine: Development of dome over square or polygonal plans.
- Romanesque: New construction methods, massiveness, verticality

and ornamentation of churches, integration of centralized and longitudinal plans.

- Gothic: Continued integration of centralized and longitudinal plans, flying buttress, ribbed vault, sensitivity towards light, use of stained glass. Cathedrals and churches.
- Central Asia: cities of Bukhara, Samarkand etc.

## TERM 2

### **Civilizations and Architecture of Ancient India**

- Indus Valley Civilization: Town planning principles, typical building layouts, sewage system, public buildings, the Great Bath etc.  
Examples from Harappa and Mohenjodaro
- Aryan Civilization: Vedic culture, town planning, its motifs and patterns.
- Buddhist Architecture: Pillars, edicts, stupas, viharas and chaityas.
- North Indian Temple forms: Three Schools -Gujarat, Khajuraho& Orissa.
- South Indian temple forms: Chalukya, Pallava, Pandya and Chola Rulers.
- Jain architecture: Jain temples and temple cities such as Palitana and Girnar.

## AR204: ARCHITECTURAL DRAWING-II

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
1	5	6	100	50	50	200

### OBJECTIVES

- To introduce the students to graphic treatment of two-dimensional drawings.
- To develop perception and presentation of simple architectural forms and building.
- To familiarize the students with preparation of perspectives by innovative methods.
- To introduce the students with perspectives of interiors.
- To develop innovative presentation techniques.

### METHODOLOGY

Studio assignments and lectures.

### CONTENTS

#### TERM1

##### **Metric drawing**

Types used & advantage

Isometric, Axonometric & oblique view.

Metric drawings, projections and their dimensions.

##### **Perspective Drawing**

Difference with metric projections.

Anatomy of perspective: Station point, Eye level, Cone of vision, Picture plane,

Horizon line, Ground line, Vanishing points,

Types of perspectives: One point, Two point, Three point

Perspectives of simple and complex blocks

Perspectives of simple household furniture items

Perspectives of Residences.

## TERM 2

### **Perspective Drawing By Innovative Methods**

Preparation of Perspective by innovative methods like approximate method, Diagonal Method, Grid Method etc.

Other innovative methods of perspective presentation.

One point and two points perspectives of interiors.

Introduction to shortcut methods in perspective drawing.

Freehand perspective drawing.

### **Presentation Techniques**

Introduction to represent different textures and finishes in plan and elevation.

Graphical representation of furniture, automobiles, human figures, etc. in plans and elevations and 3 dimensions

Preparation of presentation drawings of small buildings through planes, elevation, site plan etc. using various rendering techniques and media incorporating sciagraphy creating three-dimensional effects.

## **AR 205: WORKSHOP PRACTICES - II**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
0	2	2	50	0	50	100

### **OBJECTIVE**

To equip the students with necessary skills needed to represent design ideas in a three-dimensional format using a wide variety of materials and techniques and at different scales.

### **METHODOLOGY**

Studio Exercises.

### **CONTENTS**

Sequence of various stages and involved operations i.e. preparation of base, layout cutting, joining, fixing and finishing of various components.

Executing models for parts of buildings like stairs, curtain glazing, pergola, space frame and landscaping. One big exercise should be conducted where students make a model for their on going design studio project.

Construction of detailed building models.

Final finishing with color, texture, landscaping and human figures etc.

## AR 206: THEORY OF STRUCTURES –II

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	1A	WR	VV	TOTAL
3	0	3	75	75	0	150

### OBJECTIVE

To understand the analysis of indeterminate structures and their use.

### METHODOLOGY

Lectures and computation exercises.

### CONTENTS

#### TERM 1

##### **Introduction to deflection of beams**

Use of Macaulay's method

##### **Determinate and Indeterminate structures**

Introduction, Static determinacy and indeterminacy of 2-D structures.

##### **Types of Load**

Load on structures and load transfer mechanism

##### **Three-moment theorem**

Analysis of fixed and continuous beams.

##### **Slope Deflection method**

Analysis of fixed and continuous beams with and without yielding of supports.

##### **Moment Distribution**

Analysis of fixed and continuous beams.

#### TERM 2

##### **Design philosophies**

Strength and Serviceability requirements, Design Methods: Working Stress, Ultimate Strength and Limit State.

##### **Analysis and Design of beam sections**

Analysis of singly reinforced rectangular beam section by working stress method

Analysis and Design of beam sections for flexure by limit state method for singly and doubly reinforced rectangular, Reinforcement detailing of beam section

Behaviour of T and L beams under gravity load.

Introduction of design aids (SP:16) and IS 456:2000.

### **Shear and Bond**

Shear: Introduction, Shear stress, Design of beam section for Shear.

Bond: Introduction, Mechanism of bond resistance, Bond failure, Bond Stress, Anchorage and Development length

### **Failure Mechanism of Beams**

Failure and crack development, propagation in beams under flexure and shear

### **Overview of construction**

Types of Cement and an overview on tests conducted on cements.

Workability , segregation and bleeding of concrete and Strength of Concrete, Requirement of joints in RC.C.

Construction: Construction joints and Expansion joints.

## **AR 207: BUILDING SERVICES - I**

TEACHING HOURS			EXAMINATION MARKS			
L	TU	ST TOTAL	IA	WR	W	TOTAL
1	0	1	50	50	0	100

### **OBJECTIVE**

Introduction to elementary building services of water supply, sanitation and roads.

### **METHODOLOGY**

Exercises in layout of simple drainage systems for small buildings.Planning of bathrooms and lavatory blocks in domestic and multi-storied buildings. Exercises can also be clubbed with design studio project

### **CONTENTS**

#### **Water supply**

- Sources of water supply.
- Impurities of water and systems of water supply.
- Various kinds of water meters.
- Water storage tanks, their capacity and location.
- Calculation of water consumption.
- Domestic hot and cold water supply systems.
- Size of pipes and their joining details.
- Connections of different sanitary fittings like Ferrule, Stopcocks, Bibcocks etc.

#### **Sanitation**

Basic principles of sanitation and disposal of waste matter from buildings.

#### **Dry and wet carriage systems.**

- Sanitary fittings- washbasins, WC's, bathtubs, sink, urinals, bidets, flushing cistern, traps etc.
- Various types of joints, manholes and septic tanks.
- Proper location and ventilation of intercepting chambers and inspection chambers.
- Drainage systems- separate, combined and partially combined

systems.

Single stack system.

One pipe and two pipe systems.

Testing of house drains.

Gradients used in laying drains and sewers.

Self-cleaning and non-scouring velocities for drain pipes.

Size of drainpipes and materials used.

## **Roads**

Description and suitability of roads and comparative cost analysis.

WBM (water bound macadam) road, tar, bitumen, asphalt and RCC roads.

Soil stabilized, brick and stone paving.

Drainage- sub drains, culverts, ditches, gutters, drop inlets and catch basins.

## **AR 208: VIRTUAL ARCHITECTURE - I**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
2	0	2	50	0	50	100

### **OBJECTIVE**

Introduce techniques of photography, digital imaging and computer visualization and their role in architectural presentation.

### **METHODOLOGY**

Lectures and skill development workshops and exercises.

### **CONTENTS**

#### **Photographic studies**

Photography, cameras, basic skills, composition and the relation of aesthetics with architecture, synergy between the two fields, interrelation viz. use of landscapes and photography in interrelation with architectural designs and aesthetic principles.

Basic skills of camera operation both video and still; emphasis on image design and creative techniques; topics include exposure, lenses, composition, filters, and films. Photographing miniatures and models and their presentation.

#### **Digital imaging**

This will also involve cutting edge digital technology like scanning, printing, digital manipulation of images, presentation techniques on appropriate software for use by students.

Presentation skills for preview and postproduction of models.

#### **Computer Visualization in Architecture**

Application of current computer technologies in architecture and interior design; emphasis on the fundamentals of integrating multi-dimensional modelling, computer-aided design, and visualization methods into the design process.

## **Digital Design and Representation Tools**

With a general framework of addressing the relationship between design and representation as a whole, this module explores the role of the computer in articulating design ideas, developing conceptual approaches, and interactively representing design proposals.

This course provides an investigation of computer-aided visualization techniques through the use of commercially available software for photo-realistic rendering, lighting simulation, animation, scanning, raster graphics, and virtual reality

Soft-wares: In-design, Illustrator, Google Sketch Up

## **AR 209: COMPUTER APPLICATIONS - II**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
1	1	2	50	0	50	100

### **OBJECTIVE**

Introduction and the use of software available for architectural applications.

### **METHODOLOGY**

Integration of practical exercises along with the design studio project.

### **CONTENTS**

#### TERM1

##### **Introduction**

Introduction of various software available for Architectural application, like Auto CAD, Architectural desktop, Revit, Micro station etc. Stress should be given on Auto CAD.

##### **Basic commands for 2-D AutoCAD**

Learning basic 2D commands their function and application.  
Working on layers and colors.

Understanding of Text, and dimension styles etc, supported with suitable exercise. Understanding complex commands like P-line, SP-line, x-refs, Attributes Model space & Paper space etc.

At least one working plan, elevation and section should be completed.

#### TERM 2

##### **Basic commands for 3D**

Introduction of basic 3D commands.  
Different types of mode ling in Auto CAD.  
Exercise on wire mesh mode ling.

## **AR 210: DISSERTATION - INDIAN ARCHITECTURE**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
2	0	2	50	0	50	100

### **OBJECTIVES**

- To study historic and contemporary Indian architecture and its influence on the society and culture and its implications.
- To provide an opportunity for students to do architectural research along with design to supplement their theoretical knowledge.

### **METHODOLOGY**

After the orientation classes and lectures, the student must submit to the concerned teacher the synopsis of a research project for approval. Each student is expected to complete and submit a report (40-50 pages) at the end of the research. Classes are to be used by the students for site visits, interviews and library work.

### **SCOPE OF STUDY**

The study may be focused on a particular area/ period, or a specific building of historic / contemporary importance.

## **AR211: ARTS AND GRAPHICS - II**

TEACHING HOURS			EXAMINATION MARKS			
L/TU	ST	TOTAL	IA	WR	VV	TOTAL
1	3	4	50	50	0	100

### **OBJECTIVES**

To strengthen the students approach towards the aesthetic sense of architecture and to introduce Architecture as a functional art.

### **METHODOLOGY**

Brief lectures, studio exercises, nature studies and Visits to art galleries and museums.

### **CONTENTS**

#### **TERM1**

##### **Understanding design**

Exercises based on the concept of design, creating a motif and using it for regular organized patterns in different geometric shapes and its decorative patterns.

Designs for mural, book covers, and 3-D paper sculpture.

Exercises based on the tonal treatment in color of 2-D and 3-D objects.

##### **Still life**

Still life and a sense of perspective. To give knowledge of the relationship between the two objects with color, size and texture along with a sense of foreground and background.

##### **Sketching**

Rapid sketches based on day-to-day life like humans and animal figures, plants, fabric and furniture. To develop a sense of observation and recapitulation,

## TERM 2

### **Skill development**

Exercises based on calligraphy and typography.

Brief introduction to different paintings and media like watercolour, poster color, pastels, pen and ink, pencil color etc.

Rendering of interior and exterior of buildings in color and monochrome.

Introduction to famous Indian artists and their art works and styles.

## AR 301: ARCHITECTURAL DESIGN – III

### TEACHING HOURS

L/TU	ST	TOTAL
2	6	8

### EXAMINATION MARKS

IA	WR	VV	TOTAL
300	150	150	600

### OBJECTIVES

- Exploring and designing structural spanning systems for different requirement.
- To develop sensitivity to building by laws. To understand varied structural building systems
- To develop understanding about how to design in an urban setting.

### METHODOLOGY:

- Case studies to be clubbed with library research and live surveys.
- Site restrictions should be imposed in framing design problems.
- Detailed models to be generated with key submissions to communicate details of parking, landscaping and elevation features. Perspectives and sketches to be included in all key submissions for the development of communication skills.

### CONTENTS

#### TERM 1

#### Four structural design projects (4 week duration each).

Each project would focus on exploring structural spanning systems for large covered areas (temporary or permanent) and their integration with form. Design exercises could be sports area, exhibition hall, temporary canopy etc. The design should be formulated to increase awareness and application about advanced structural systems and latest building material.

- Arcuated- corbelled, radiating arch, vault and dome, squinch and pendentives.
- Vector structures- trusses and space frames, slabs, one way and two way coffer.
- Form structures- folded slabs, shells, hyperbola and parabola.
- Tensile- tents, cables and pneumatic vis-à-vis materials and plan shapes.

Emphasis of the problems would be on the design parameters and graphical presentation rather than detailed structural analysis.

## TERM 2

### **One complex design problem (16 week duration).**

The project would involve the study and design of a multi-storied building like office building, shopping mall, hotel, college and hostel, commercial complex, small hospital etc. the focus would be in understanding how to design for an urban setting, other design issues are:

- Detailing of circulation areas like lifts staircases etc. to develop sensitivity to horizontal as well as vertical circulation requirements in multi story building.
- Integration of design with structural and construction details, for this, the project should be integrated with the structures and building construction classes. One set of detailed working drawings must be generated at the end of the design process.

## **AR 302: BUILDING CONSTRUCTION- III**

### **TEACHING HOURS**

L/TU ST TOTAL

1 4 5

### **EXAMINATION MARKS**

IA WR VV TOTAL

150 75 75 300

### **OBJECTIVE**

Introduction to a wide range of modern building construction systems incorporating the use of metals like steel and aluminium and composite materials.

### **METHODOLOGY**

- Lectures and Studio assignments for understanding construction details.
- Site visits and library studies to supplement the studio work regarding materials and construction methods.

### **Construction**

- Doors: different types of doors in steel, aluminium and glass. Sliding, sliding and folding, revolving doors. Fire proof and Sound proof doors. Types of Rolling Shutters.
- Windows: different types of windows in steel, aluminium and glass. Sliding windows in steel and aluminium.
- Staircases: Special staircases in steel. Fire Escape Stair Cases.

### **Materials**

- Composite materials: R.C.C. and R.B.W. use of Bamboo for reinforcement.
- Water proofing materials and systems for basement.
- Sections of doors and windows(I.S. 1038 etc)

### **TERM 2**

### **Construction**

- Roofs and trusses: steel trusses.
- Detail of terracing for flat roofs.
- Water proofing and rain water disposal.

### **Materials**

- Metals Used in Buildings: Properties Constituents and Uses of Cast Iron, Wrought iron, steel, stainless steel, Bronze, Aluminum and Copper.
- Hot rolled sections, cold forming of sheets into sections.
- Materials for terracing Mud- phaska and Brick Tiles and other new systems for terracing.
- Common sections in Brass and Aluminum.
- Pipes in mild steel, stainless steel, cast iron brass and copper.

## **AR 303: HISTORY OF ARCHITECTURE- II**

### **TEACHING HOURS**

L/TU ST TOTAL

2 0 2

### **EXAMINATION MARKS**

IA WR VV TOTAL

75 75 0 150

### **OBJECTIVES**

To study the architecture of the medieval and modern world with a focus on India. The architectural styles and buildings would be discussed in context of their period. Geographical/climatic conditions, economic and political conditions, social and religious customs, construction and technology, building material and structure.

### **METHODOLOGY**

Lectures and site visits to acquaint students with historic sites and buildings of Delhi.

### **CONTENTS**

#### **TERM 1**

##### **Architecture of medieval & modern western world**

- Islamic architecture: Islam and its philosophy, its implementation in various building types such as mosque, tomb, fort and their elements like domes, minarets, arch etc.
- Renaissance, mannerism (monumentality and spatial effects of forms, use of orders), post renaissance: Baroque & neo- classicism in parts of Europe.
- Modern architecture: various modern movements in different parts of the western world and their role in defining modern architecture such as post impressionism, expressionism, art nouveau, surrealism abstract expressionism cubism etc.

#### **TERM 2**

##### **Architecture of medieval & modern India**

- Sultanate rulers: slave, Khilji, Tughlak and Lodi dynasties and their architecture in and around Delhi.
- Provincial styles: styles developing in regional provinces such as Punjab, Bengal, Gujarat, Jaunpur, Bijapur, Bidar and the Deccan.
- Rajasthani architecture: study of building types like Havelis, step wells, gates, Baradaris and their architectural characteristics. Fortified cities of Jaisalmer, Jaipur etc. forts and palaces in Mandu, Chittorgarh, Orcha, Jodhpur etc.
- Mughal Architecture: Babar, Humayun, Akbar, Jahangir, Shahjahan, and Aurangzeb. Architecture during the rule of later Mughals and development of Regional styles in Awadh, Bengal, Malwa, Jaunpur etc.
- Colonial Architecture: British Architecture and its impact on Indian Architecture in the colonial days.
- New Delhi: Planning criteria, architectural features, stylistic influences, Rajpath, India gate, Viceroy's Palace (Rashtrapati Bhavan) etc.

## **AR 304: PRINCIPLES OF HUMAN SETTLEMENTS**

### **TEACHING HOURS**

L/TU ST TOTAL

2 0 2

### **EXAMINATION MARKS**

IA WR W TOTAL

50 50 0 100

### **OBJECTIVES**

To study the patterns of human settlements and their relevance to architecture.

### **METHODOLOGY**

Lectures and library studies.

### **CONTENTS**

#### **Man and Environment**

Biological and behavioural responses to human settlements.

Design for living, natural and built- environment.

#### **History of human settlements**

Origin and growth of human settlement. Primitive people, shelters, settlements, burial systems, megaliths and memorials.

Role of river banks in growth of human settlement.

Settlement patterns of Nile Valley Civilisation

Settlement patterns of Indus Valley Civilisation

Settlement patterns of Aryan / Vedic Civilisation

Settlement patterns of Euphrates and Tigris Valley Civilisations

Settlement patterns of Chinese Civilisation

Medieval towns in Europe and India

Renaissance city planning

Industrial revolution

## **AR 305: ESTIMATION AND COSTING**

### **TEACHING HOURS**

L/TU ST TOTAL

2 0 2

### **EXAMINATION MARKS**

IA WR VV TOTAL

75 75 0 150

### **OBJECTIVES**

To equip students with the necessary technical knowledge for calculating estimates and detailed costing for small to medium scale projects.

### **METHODOLOGY**

Small-scale projects to be undertaken to understand costing principles and terms. Final costing exercise to be carried out where students can undertake the costing of their studio design project.

### **CONTENTS**

#### **TERM 1**

##### **Systems**

Systems of taking quantities and estimating for all trades involved in construction of medium complexity project.

##### **Specification**

Writing of specification for Quantities.

Items of work and materials.

##### **Classification of areas**

Plinth area, covered area, floor area, carpet area and projection area.

##### **Types of estimates**

Preliminary, detailed.

##### **Methods of taking out quantities for building works.**

Preparation of bill of Quantities (BOQ).

Mode of measurements of quantities.

Market rates of labor and building materials.

Labor turnout and norms for consumption of basic materials.

#### **TERM 2**

##### **Schedule of rates**

CPWD

PWD

Cost index.

Analysis of rates for common items of work like cements concrete, brick work, painting etc.

Methods for preparation and submission of preliminary estimates and detailed estimates.

##### **Tender**

Tender notices and tender documents.

Types of tendering in practice.

Process of tendering.

Preparation of tender notes/ documents and comparative statements

Award of tenders

## **AR 306: THEORY OF STRUCTURES- III**

### **TEACHING HOURS**

L/TU ST TOTAL

4 0 4

### **EXAMINATION MARKS**

IA WR VV TOTAL

75 75 0 150

### **OBJECTIVES**

To understand the design elements of Reinforced Cement Concrete, Steel structures along with soil mechanics and foundation engineering.

### **METHODOLOGY**

Lectures and exercises in independent design of structural elements.

### **CONTENTS:**

#### **TERM 1**

##### **Slabs**

Introduction, Types of slab, Design of One-Way Slab and Two-Way Slab, Reinforcement detailing of slabs

##### **Design of column**

Introduction, types of column, effective length, behaviour of columns under gravity load, Design of axially loaded short columns by limit state method.

Use of interaction curves (Design aids SP: 16) for design of columns subjected to axial and uni-axial bending.

Detailing of column reinforcement.

##### **Design of building element**

Design of continuous beams, Single-bay Portal Frames

#### **TERM 2**

##### **Design of Staircase**

Types of stair case, Effective span of stairs

Distribution of loading on stairs

Simple case of design of stairs.

##### **Elements of soil mechanics**

Preliminary definitions and relationships, Introduction of bearing capacity, Rankine's Theory of Earth Pressure (Simple Cases), Sub-Soil Investigation.

##### **Foundation engineering**

Introduction, Types of foundation, Introduction to Shallow and Deep Foundations.

Design of Strip and Isolated footings.

**Retaining walls**

Introduction, types of retaining walls, stability analysis of gravity and cantilever retaining walls, Design of retaining walls

**Steel structures**

Design of Riveted, Bolted and Welded Connections (simple cases only).

Introduction of Tension & Compression Members.

Beam & Plate Girders

Grillage Foundation.

## **AR 307: BUILDING SERVICES- II**

### **TEACHING HOURS**

L/TU ST TOTAL

2 0 2

### **EXAMINATION MARKS**

IA WR VV TOTAL

75 75 0 150

### **OBJECTIVES**

To teach the schematic layout of simple electrical, illumination, lift and fire fighting system for domestic and office buildings.

### **METHODOLOGY**

Lecture and studio exercises Application of Materials and construction techniques listed below in the design exercises conducted in Architectural design (AR201)

### **CONTENTS**

#### **TERM 1**

##### **Electrical Services**

Laws of electrical circuit- Ohm's and Kirchoff's laws and basic principles.

Circuits- series and parallel.

Common domestic installations- water heater, radiator etc.

Wires- specifications and carrying capacity and calculation of electrical loads.

Types of switches, sockets and fixtures.

Distribution boards, circuit breakers, fuses, electrical meters and their layout.

Design considerations for electrical installations.

Protection against overload, short circuit, earth fault, lightning conductors and other safety measures for buildings.

Wiring systems- methods of wiring, joint and loop in.

Types of electrical wiring- batten, capping & casing, concealed conduits etc.

Wiring material- types, sizes and specifications, main switch, MCB, DB meter.

##### **Illumination**

Light and its propagation, reflection, radiation, transmission and absorption.

Definitions and units of flux, solid angles, luminous intensity, brightness.

Laws of illumination, types of illumination schemes- direct, semi direct, indirect and defused lighting and their design considerations.

Light flux method for calculation of number of lamps for illumination.

Incandescent, sodium vapour, mercury vapour, fluorescent and neon lamps etc.

Types of luminaries for interior and exterior lighting.

Residential, commercial, industry, flood and street lighting.

Tests before commissioning of electrical services.

## TERM 2

### **Air conditioning**

Principles of air conditioning.

Psychometric chart, comfort zone.

Refrigeration cycle and air cycle.

Methods of cooling and heating.

Evaporative cooling systems of air conditioning.

Unit air conditioners and central air conditioning plants.

Standards and prescribed locations for various parts.

Descriptive details of plants and duct layout.

Air distribution system fans, filters, ductwork, outlets, and dampers.

Natural and artificial ventilation.

Cooling load for AC.

## **AR 308: VIRTUAL ARCHITECTURE- II**

### **TEACHING HOURS**

L/TU ST TOTAL

2 0 2

### **EXAMINATION MARKS**

IA WR VV TOTAL

50 0 50 100

### **OBJECTIVES**

Intro to technical and aesthetic concepts of interface design.

### **METHODOLOGY**

This module consists of lectures and self- motivated projects leading from basic 3D modeling and animation to the existing world of virtual environments.

### **CONTENTS**

#### **Interface design**

Introduction to technical and aesthetic concepts of interface design, including interface design for the Web, graphics, video, and sound.

Introduction to basic interactive multi- media programs, intermediate asset preparation, and delivery systems (internet, CD, kiosk, etc.).

#### **Digital Fabrication**

Introduction to the fact that digital technology is transforming not only the way buildings are conceived and designed; it is transforming the way buildings are constructed.

This course also explores the crossover between computer- aided designs, through a series of hands on labs and small design projects students learn various software applications and computer driven hardware tools as a means of introducing a basic concepts of construction.

#### **Virtual worlds, 3D modelling and animation**

This module aims at developing competency and confidence in rapidly developing technology. The focus is on mastering technical challenges on aesthetics and creativity.

## **AR 309: COMPUTER APPLICATIONS- III**

### **TEACHING HOURS**

L/TU ST TOTAL

1 2 3

### **EXAMINATION MARKS**

IA WR VV TOTAL

75 50 25 150

### **OBJECTIVES**

Advanced learning of software available for architectural applications.

### **METHODOLOGY**

Integration of practical exercises along with the design studio project.

### **CONTENTS**

#### **TERM 1**

##### **AutoCAD 3D**

Understanding co-ordinate systems.

Introduction of solid modelling.

Learning solid modelling commands, editing solid modelling.

Working on different planes.

At least one exercise should be completed I 3D modelling.

#### **TERM 2**

##### **Revit**

Introduction of Revit.

Advantages of Revit over AutoCAD.

Learning various 2D & 3D commands supported with suitable exercise.

Basic working commands for Adobe Photoshop, Adobe PageMaker and Corel Draw as applications helpful in Architectural presentations.

## **AR 310: DISSERTATION- INDIAN ARCHITECTS**

### **TEACHING HOURS**

L/TU	ST	TOTAL
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2	0	2
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### **EXAMINATION MARKS**

IA	WR	VV	TOTAL
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50	0	50	100
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### **OBJECTIVES**

To understand the face of contemporary Indian architecture through a study of Indian architects, their projects, their design philosophies and their role in shaping contemporary Indian architecture.

### **METHODOLOGY**

After the orientation classes and lectures, the student must submit to the concerned teacher the synopsis of a research projects for approval. Each student is expected to complete and submit a report (20-25 pages) at the end of the research. Classes are to be used by the students for site visits, interviews and library work.

### **SCOPE OF STUDY**

Areas of study would be the in-depth study of any contemporary Indian architect and his/ her projects to understand his/ her design philosophy and analyze his/ her contribution to Indian architecture.

## AR 401: ARCHITECTURAL DESIGN- IV

### TEACHING HOURS

L/TU ST TOTAL

2 6 8

### EXAMINATION MARKS

IA WR VV TOTAL

200 100 100 400

### OBJECTIVES

- Integration of all aspects about a building design and its workings- including service details, assessment of environmental impact, innovative structural systems and materials etc.
- Evolving sensitivity to design of spaces at the urban scale- creations of nodes and links, visual landmarks, activity and interaction zones, relationship between commercial, recreational and residential areas.

### MATHODOLOGY

- Site studies to be carried out on a larger scale to analyze implications of the entire context within which the project is to be executed.
- Large scale models to be used for assessing site conditions and restrictions.
- Design process to incorporate panel discussion and seminar presentations.
- Presentations to be made using 3- D visualization.

### CONTENTS

#### TERM 1

##### **Group housing (14 week duration).**

One project would address the solution to a large- scale multi story project like group housing, commercial complex etc. design proposals should study and address issues like movement of people and traffic, servicer, waste disposal management through detailed case studios. Sensitivity to use of materials, lighting, landscape and services must be a part of the solution.

The project could also focus on the design for economically weaker section- slum up- gradation projects, site and services schemes etc. in such projects the focus would be on devising economically viable alternative building materials, structural systems and service options.

#### TERM 2

##### **Urban design (16 week duration).**

- The problem would be introduced before the end of the first term and case study/ site visit would be undertaken during the term break. The project would be a medium sized urban design intervention.
- The design solution would address issues like demography, market value, land use patterns etc. Other design issues are the detailing of open and built areas after studying human and vehicular traffic movement patterns. The project should be substantiated by detailed site surveys and reading about urban design principles. Study models must accompany every stage.

## **AR 402: BUILDING CONSTRUCTION- IV**

### **TEACHING HOURS**

L/TU ST TOTAL

1 5 6

### **EXAMINATION MARKS**

IA WR VV TOTAL

200 100 100 400

### **OBJECTIVES**

Introduction to construction details of specialized building elements like skylights, soundproof paneling, pre-cast and pre- stressed concrete elements etc.

### **METHODOLOGY**

- Lectures and studio assignments for understanding construction details.
- Site visits and library studies to supplement the studio work regarding materials and construction methods.

### **CONTENTS**

#### **TERM 1**

##### **Construction**

Soundproof doors, bay windows, skylights.

Foundations: pile foundation- details of pile, pile caps and types of piles.

##### **Materials**

Study of various new materials like Corian, Veneers, ETFE, Hydro-ceramics, Self Healing Concrete, Light Gauge Steel Structure, PVC, Particle board

#### **TERM 2**

##### **Construction**

Partitions: construction and details of glazed, lightweight and soundproof partitions and soft paneling.

Pre- cast and pre- stressed and post tensioning of concrete members.

Modular construction.

## **AR 403: ELECTIVE- I**

### **TECHING HOURS**

L/TU ST TOTAL

1 0 1

### **EXAMINATION MARKS**

IA WR VV TOTAL

50 0 50 100

### **OBJECTIVES**

Intensive study of one of the following subjects so that students may have a base for doing specialization in specific field of architecture.

### **METHODOLOGY**

The course shall consist of lectures/ tutorials/ practical and self- study. The student will select a topic within his chosen subject with the consent of the concerned teacher and submit a detailed report/ presentation; the report shall be submitted in 3 copies.

### **ELECTIVES**

- Rural habitat
- Vastushastra
- Vernacular architecture
- Adaptive Reuse of Buildings
- Green Buildings Rating Systems (LEED/GREHA/IGBC others)
- Contemporary Islamic Architecture
- Language- Persian, Arabic or French (with the Department of foreign languages, Jamia Millia Islamia).
- History of Indian architecture (with the department of history, Jamia Millia Islamia).

Viva- voce regarding the study and report shall be conducted by one external and one internal examiner.

## **AR 404: TOWN PLANNING**

### TEACHING HOURS

L/TU ST TOTAL

2 0 2

### EXAMINATION MARKS

IA WR VV TOTAL

50 50 0 100

### **OBJECTIVES**

Introduction to settlement and town planning.

### **METHODOLOGY**

Lectures and seminar presentation.

### **CONTENTS**

Introduction to Town Planning

Town Planning concepts

Evolution of Planning concepts : City beautiful movement, Garden cities, Radburn city and neighbourhood concept

Pioneers of modern town planning-Luis Mumford, Patrick Geddes, Doxiadis, Kevin Lynch, Tony Garnier, Soriya Y Mata, Le Corbusier, Frank Lloyd Wright

Contemporary planning theories

Theory and method

Planning theory and process

Quantitative methods in Urban Planning

Use of Geographic Information System and Remote Sensing in Planning

URDPFI guidelines

Urban Design

Functional Planning practice

Landuse Planning

Zoning and Development Controls

Transportation and Public Facilities Planning

Environmental Planning

Case study of existing settlement

Hands-on exercise on local area planning

## **AR 405: LANDSCAPE**

### **TEACHING HOURS**

L/TU ST TOTAL

2 0 2

### **EXAMINATION MARKS**

IA WR VV TOTAL

50 0 50 100

### **OBJECTIVES**

- Introduction to the role of landscape elements in architectural design.
- Impacts of landscape elements on environment.

### **METHODOLOGY**

Landscape design work shall be conducted as part of architectural design studio.

### **CONTENTS**

#### **Basic elements of landscape**

- Land
- Water
- Vegetation

Study and detailing of hard and soft landscape

#### **Services related to landscape:**

- Plumbing
- Electrical
- Sewage management
- Water supply

#### **Plant material**

A study of Indian vegetation. Its characteristics and design aspects.

- Trees
- Shrubs
- Ground cover
- Indoor plants

#### **Grading and slopes**

#### **Working Drawings for any one landscape design project**

#### **Landscape design concepts of**

- Europe
- Japan
- India
- China
- Renaissance

## **AR 406: THEORY OF STRUCTURES- IV**

### **TEACHING HOURS**

L/TU ST TOTAL

3 0 3

### **EXAMINATION MARKS**

IA WR VV TOTAL

50 0 50 100

### **OBJECTIVES**

To understand the modern trends and challenges in building structural systems.

### **METHODOLOGY**

Lectures by the experts in the fields will be arranged to make the students to understand advance structure techniques available for construction of complex structures.

### **CONTENTS**

#### **Earthquake resistant design**

Elements of earthquake engineering, zoning, base shear, lateral forces, ductile detailing

Introduction to new codes.

#### **Introduction to computer aided structural design**

Demo of Practical problems using STAAD

#### **Theory of domes, shells & folded plates.**

(Following systems and techniques are to be understood conceptually. Calculations/ design for these techniques and systems are not expected.)

Synthesis of force systems to create structural system.

Vector active, surface active and bulk active systems.

Theory of folded plates, domes shell, vault.

Space frame, flat slabs, hollow floor.

Portal frame, cables and suspension structures.

Structure system for seismic zone

Inflatable structure

## **AR 407: BUILDING SERVICES- III**

### **TEACHING HOURS**

L/TU ST TOTAL

2 0 2

### **EXAMINATION MARKS**

IA WR VV TOTAL

50 50 0 100

### **OBJECTIVES**

- To understand the schematic layout of simple air conditioning system of domestic and office buildings.
- To understand the methods and materials available for planning of soundproof areas in buildings.
- Understanding of intelligent buildings and devices used in them.

### **METHODOLOGY**

•Lectures and schematic layouts exercise. Application of the building services in the studio project 'Housing' carried out in Architectural design (AR401)

### **CONTENTS**

#### **TERM 1**

##### **Acoustics**

Principles of transmission and passage of sound.

Factors influencing hearing conditions.

Noise reverberations, resonance, reflection and absorption of sound, reverberation time.

Acoustical defects in rooms and their solutions.

Echo, dead points, sound foci, feedback etc.

Structure born and air born sounds.

Types of absorbents and reflectors, co- efficient of efficiency.

Reverberation time and time delay for rooms like classrooms, lecture rooms, multipurpose halls, conference rooms and auditoriums.

Noise pollution within and outside buildings and its remedies.

##### **Fire fighting**

Causes and spread of fire. Combustibility of materials and safety norms.

Fire detection and fire-fighting equipment- smoke detectors, monitoring devices, alarm systems etc.

Design of fire escapes for high- rise buildings.

#### **TERM 2**

##### **Lifts**

Types of lifts, their control and operation.

Definition of average lift carrying capacity, rated load, rated speed, RTT etc.

Details of lift section, machine room, equipment, lift well and lift pit.

Design standards for lifts lobby, lift cars size etc from building codes.

Escalators and conveyors.

**Intelligent Buildings**

Sensing and auto operation devices for electrical, air conditioning, plumbing and waste disposal services.

Water harvesting.

Use of non- conventional sources of energy for energy efficient buildings.

## **AR 408: HUMANITIES**

### **TEACHING HOURS**

L/TU ST TOTAL

2 0 2

### **EXAMINATION MARKS**

IA WR VV TOTAL

50 50 0 100

### **OBJECTIVES**

To understand the society to which architect server as well the psychological implications in designing buildings and townships.

### **METHODOLOGY**

Lectures.

### **CONTENTS**

#### **TERM 1**

##### **Elements of psychology**

Study of intelligence, sensitivity creativity, logic & reasoning.

Implications of psychological issues in design of buildings and town ships.

Psychology and use of color in architecture.

##### **Social science**

Man nature & society

Concept of social, political, religious and cultural structure and their impact.

Traditional pattern and trends of change, concept of social stratification.

Imbalance in labor pool, rural urban dynamics and resultant migration.

Impact of industrialization on traditional society.Modernization, urbanization.

#### **TERM 2**

##### **Economics**

Theory of demand and supply, economies of scale.

Micro economy, macro economy.

Mercantile economy, industrial economy, agrarian economy cost benefit analysis, feasibility, viability.

Financing and institutions associated with housing and infrastructure development.

Agenda, program, plan, project, five year plans in India.

##### **Indian Governance.**

Union Government

State Government

Local Government.

Elements of democracy, welfare state, socialism, capitalism.

## **AR 409: BUILDING BYE LAWS**

### TEACHING HOURS

L/TU ST TOTAL

1 0 1

### EXAMINATION MARKS

IA WR VV TOTAL

25 25 0 50

### **OBJECTIVES**

Introduction of the need and importance of building byelaws and their applications.

### **METHODOLOGY**

Lectures. The exercise on building bye- laws shall be part of architectural design.

### **CONTENTS**

#### **Bye- laws**

Need and importance of building bye- laws.

Authority behind building byelaws.

Various laws for Regulation of building operations and urban development.

Detailed discussion of bye- laws related to plot size, setbacks, site coverage, light and ventilation, sanitation etc.

Bye- laws related to site planning and housing layouts, Master Plan, land use, density, width of roads, open areas, public utilities.

Submission drawings for municipal approvals for individual houses, Commercial buildings and housing layouts.

#### **Standards: use of codes**

Difference between codes and byelaws

Bureau of Indian standards

National building codes

IS 456

Other codes of BIS

Time saver standards, Neuferts etc.

#### **Housing**

Housing needs and different types of housing: individual and multifamily dwellings, group/ community housing.

Urban and rural housing.

Low cost housing in urban and rural context.

Studies Exercises: Group housing projects- Low rise and high rise alternatives.

#### **Energy Conservation Building Code**

Commercial Buildings

Residential Buildings

## **AR 410: SEMINAR- INDIAN HABITAT**

### **TEACHING HOURS**

L/TU	ST	TOTAL
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2	0	2
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### **EXAMINATION MARKS**

IA	WR	VV	TOTAL
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50	0	50	100
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### **OBJECTIVES**

To study the various aspects of Indian Habitat (vernacular construction materials and methods etc.) and their application in contemporary Indian Architecture.

### **METHODOLOGY**

After the orientation lectures, the student must submit to the concerned teacher the synopsis of at least two different research projects for approval out of which one would be selected depending on kits merit for research. Each student is expected to complete and submit a report (40- 45 pages) at the end of the research. Classes are to be used by the students for site visits, interviews and library work.

### **SCOPE OF STUDY**

The study shall focus on detailed study of a specific residential area/ dwelling cluster/ cooperative housing/ corporate housing or a particular issue related to Indian historical/ traditional or contemporary habitat.

## **AR 411: INTERIOR DESIGN**

### TEACHING HOURS

L/TU ST TOTAL

1 1 2

### EXAMINATION MARKS

IA WR VV TOTAL

50 0 50 100

### **OBJECTIVES**

- To define how interior space planning varies from architecture.
- Introduction to various methods of interior space planning and execution including detailed anthropometric studies, materials, finishes and lighting.

### **METHODOLOGY**

Lectures, presentations. Final exercise is to be integrated with the design studio projects.

### **CONTENTS**

#### **Anthropometrics for Interior Design.**

Human scale / static / posture/ Dynamic spaces

Furniture Anthropometrics

#### **Principles of Interior Design**

Elements of interior design

Tools of interior design

Color, illuminators, furniture, furnishings and accessories.

#### **History of Modern Furniture Design**

Gerrit Riet Weld

Breur

KaarKlint

Alvar Aalto

Mies Van Der Rohe

Le Corbusier

Eero Saarinen

Charles Eames

Moulded Furniture

Modular Furniture

#### **Exercises**

Toilet Design

Office Design

Kitchen Design

Restaurant

Show room

## **AR 412: MANAGEMENT**

### **TEACHING HOURS**

L/TU	ST	TOTAL
2	0	2

### **EXAMINATION MARKS**

IA	WR	VV	TOTAL
50	50	0	100

### **OBJECTIVES**

To equip students with basic management techniques needed for office and project management.

### **METHODOLOGY**

Lectures.

### **CONTENTS**

#### **TERM 1**

Organisation and Management

Formal and Informal organisation

Hierarchy

Scientific Management – CPM, PERT, Bar Chart etc.

Decision Making

Motivation

Communication Systems and Feedback Mechanism

Project Management

#### **TERM 2**

Financial Management – budgeting, balance Sheet, Income Expenditure

Project Appraisal

Inventory Management – Inputs & Outputs

Entrepreneurship - The entrepreneurs' tasks and special challenges of entrepreneurship.

## **AR 501: THESIS**

### **TEACHING HOURS**

L/TU	ST	TOTAL
5	15	20

### **EXAMINATION MARKS**

IA	WR	VV	TOTAL
600	0	600	1200

### **OBJECTIVES**

Thesis projects must reflect the culmination of the development of the student's architectural skills and design attitude. The project must be chosen so as to address and resolve, through design, all aspects of the design process.

### **METHODOLOGY**

The student must submit to the department the synopsis of at least two different design/ research projects for approval out of which one would be selected depending on its merit for scope of design intervention and its scale.

A guide to supervise the studies will be appointed by the head for each student. Regular progress in studio will be carried in six states during the exercise; each stage will have a presentation to the internal jury for thesis.

The stage submissions must be based and supported by detailed analytical studies that lay down the validity of the design criteria and detailed methodology. The following are the basic guidelines for the planning the thesis design project and its submissions:

1. Detailed site study of existing site conditions and context and evolving design directives and concept.
2. Case studies to be clubbed with library research and surveys.
3. Site restrictions should be followed as applicable for building byelaws of parking, FAR, fire, security and services.
4. Initial concept stage to experiment with shapes and forms to evolve a built volume through block model studies.
5. Incorporating landscape to understand interaction between built and open space.
6. Study and address issues like movement of people and traffic services, waste disposal management etc.
7. Develop details for use of materials, lighting, landscape and services.
8. Final proposal to include specialized aspects o service details, assessment of environmental impact, innovative structural systems and material etc.

In special cases depending upon past achievements and aptitude, the institute may allow a research project to be undertaken in lieu of a design project.

### **SCOPE OF STUDY**

The projects chosen could vary in scale from small individual buildings to large complexes to urban design intervention. The project should be such that it highlights the student's individual innovation in the architectural design process.

## **AR 502: PROFESSIONAL PRACTICE**

### **TEACHING HOURS**

L/TU ST TOTAL

6 0 6

### **EXAMINATION MARKS**

IA WR VV TOTAL

50 50 0 100

### **OBJECTIVES**

To introduce aspects of professional conduct, duties and responsibilities and legal rights and procedures of the architectural profession.

### **METHODOLOGY**

Lectures.

### **CONTENTS**

#### **Architectural profession today**

Registration under architect act 1972.

Main provision of architects act, AICTE Act.

Architects role in society and careers in architectural profession.

Architects in practice and his office organization.

Basic account keeping and preparation of balance sheet.

Scale of professional fees, mode of payment, professional conduct and ethics.

#### **Indian Institute of Architects**

Its role as a professional body for promotion and regulation of the architectural profession and assisting its members, ARCASIA (Architects Regional Congress of Asia), common wealth Architects Association, UIA (Union International des Architects).

#### **Law related to the profession**

Introduction of following acts: contracts, arbitration, environmental, consumer protection, Negotiable instrument, easement, partnership.

Income tax, Goods and Services tax, professional tax.

IPR (Intellectual Property Rights)

#### **Tender and contracts**

Preparation of tender documents, inviting and opening of tenders, comparative statements.

Architects recommendations.

Signing of the contract.

Architectural competitions.

#### **Valuation**

Role of architect as an evaluator.

General principles and methods of evaluation of buildings.

#### **Arbitration**

Role of an architect as an arbitrator.

#### **Introduction to agencies related to Architectural profession**

HUDCO, Development Authority, TCPO etc.

Housing financing Agencies: HDFC, Banks, LIC, HUDCO etc.

## **AR-503: ELECTIVE – II**

### **TEACHING HOURS**

L/TU	ST	TOTAL
4	0	4

### **EXAMINATION MARKS**

IA	WR	VV	TOTAL
50	0	50	100

### **OBJECTIVE**

Intensive study of one of the following suggested topics so that students may have a base for doing specialization in specific field of architecture pertaining to their thesis project .

### **METHODOLOGY**

The course shall consist of lectures/tutorials/practical and self study.

The student will select a topic as an elective and will detail out that component of his/her thesis project. The topic shall be selected with the consent of the head of the department.

At the end student is required to submit a detailed report/presentation. The report shall be submitted in 3 copies. One copy shall be filed with the library for future reference.

Following is a suggested list of topics; however student in consultation with the guide can explore any other dimension of the vast field of architecture:

Building materials, Landscape architecture, Structures, Urban Conservation, Building management systems, Fire Fighting, Air Conditioning, Lighting, Security Systems, Acoustics, Adaptive Reuse, Energy Efficiency, Research.

The viva voce exam of this subject shall be carried out at the end of the first term and shall be conducted by one external and one internal examiner.