



REGULATIONS,  
SCHEME OF EXAMINATION  
AND  
SYLLABUS

(As prescribed by ManipalUniversity)

**BACHELOR OF ARCHITECTURE**  
(B. ARCH.)  
Five Year Degree Course

APPLICABLE FROM THE ACADEMIC YEAR  
2010 - 2011



REGISTRAR  
MANIPAL UNIVERSITY  
MANIPAL



Deputy Registrar (Tech.)  
Manipal University  
Manipal - 576 104

# **A RULES AND REGULATIONS**

## **1. TITLES OF THE COURSES:**

- 1.1 Undergraduate degree course in Architecture — Bachelor of Architecture, abbreviated to B. Arch.
- 1.2 Undergraduate degree course in Architecture — Bachelor of Architecture in Interior Design, abbreviated to B. Arch. (ID)
- 1.3 Post-graduate degree course in Architecture - Master of Architecture (Advanced Design), abbreviated to M. Arch. (AD).

## **2. DURATION OF THE COURSES:**

### **2.1 Normal Duration:**

B.Arch. — 5 Years (10 Semesters)

B.Arch. (ID) — 5 Years (10 Semesters)

M. Arch. — 2 Years (4 Semesters)

2.2 Maximum Permissible duration of a course is twice the normal duration of that course.

2.3 Each semester's programme is made up of about 17 weeks of classes and related academic activities, immediately followed by about two weeks of end-semester examinations in the subjects of the current semesters. 3 to 4 weeks after declaration of the results, make-up (supplementary) examinations will be conducted in the same subjects, before the commencement of the next semester.

## **3.0 EDUCATIONAL PROCESS**

### **3.1 Programme Of Studies and Educational Process:**

Manipal University seeks to provide education which is globally accepted. In all programmes of study, great emphasis is placed on the use of modern communication technology to facilitate imparting of quality education to students. In some courses of study computer aided instruction is adopted.

The University is committed to develop an efficient and flexible system. The semester system of calendar with continuous and comprehensive evaluation is adopted.

The programmes of study are made up of a number of credits. Each semester of study has minimum requirements of number of course credits that must be taken.

Each course is defined in terms of contact hours, which may be represented by studios, lectures, tutorials and practical sessions. Invariably a student will be required to carry out assignments and self- study which may greatly exceed the actual number of contact hours defined for the course.

### **3.2 Credit — Based System:**

- 3.2.1 The educational process at MSAP, Manipal uses a Credit Based System wherein the course content is expressed in number of credits. The present system after several modifications is known as the 'Revised Credit System'.
- 3.2.2 The course content of individual subjects — studio, theory as well as practicals — is expressed in terms of a certain number of credits. The number of credits assigned to a subject depends on the number of contact hours per week. Normally, in the case of theory subjects, the number of credits is equal to the number of contact hours (studios, lectures & tutorials) per week, while in the case of practicals, one credit is assigned for every three contact hours per week.
- 3.2.3 The course content of each semester is expressed in terms of a specified number of credits. A student is deemed to have successfully completed a particular semester's programme of study when he/she earns all the credits of that semester, i.e., he/she has no F grade in any subject of that semester.
- 3.2.4 Promotion of a student to higher semesters is based on his/her earning a prescribed minimum number of credits, as detailed in 3.5
- 3.2.5 When a student earns the specified number of credits in every one of the specified number of semesters making up the course, he/she is deemed to have completed the requirements for graduation. This also means, a student should have an E grade or better in every subject of every semester, in order to be eligible to receive the degree.
- 3.2.6 The ninth & tenth Semesters of B. Arch./ B.Arch(ID) course are devoted to professional training.

### **3.3 Outline of Evaluation**

- 3.3.1 The student performance in each theory course (subject) is evaluated out of a maximum of 100 marks — of which 50 marks are for in-semester assessment and 50 marks for the end-semester examination.
- 3.3.2 The in-semester assessment in theory subjects is based on sessional tests, assignments, quizzes, case presentations, seminars etc. The students shall be informed, sufficiently in advance, of the procedure followed for in-semester assessment.
- 3.3.3 The student performance in practical is also evaluated out of a maximum of 100 marks, and is based totally on in-semester assessment by the concerned teachers/departments. There will be no end-semester examination in practical. The in-semester assessment is based on the work done by the student in the class, class tests, assignments, viva voce etc. The students shall be informed, sufficiently in advance, of the procedure followed for in-semester assessment

### **3.3.4 Evaluation of Architectural Design for students of the B. Arch./ B.Arch.(ID) Course.**

3.3.4.1 The evaluation of In-semester coursework in the subject of Architectural Design/Interior Design in all the semesters will be out of 50 marks. In-semester evaluation will be done by the panel of studio teachers on the works done for the In-semester coursework. The End-semester evaluation will be out of 50 marks. The grade awarded to the student will be on the basis of the total marks obtained by him/her out of 100.

The process for the In-semester and End-semester evaluation for Architectural Design/Interior Design subject of all semesters will be completed before the commencement of End-semester Theory Examinations.

In case the student is unable to clear the subject, he/she has to repeat the complete In-semester coursework during the corresponding Summer Semester and appear for the Make Up evaluation.

3.3.4.2 The End-semester evaluation for Architectural Design/Interior Design I, III, V & VII will be through Viva-Voce evaluation, conducted by a jury consisting of minimum one internal examiner and minimum one external examiner. The Viva-Voce will be conducted on the In-semester coursework.

3.3.4.3 The End-semester evaluation for Architectural Design/Interior Design II, IV, VI and VIII will be through a Design Time Test for 6, 12, 18 and 18 hours respectively, and subsequent Viva-Voce evaluation of the same, done by a jury consisting of minimum one internal examiner and minimum one external examiner.

### **3.3.5 Evaluation of Thesis Project / Professional Training in B. Arch. /B.Arch(ID) Course.**

3.3.5.1 Thesis Project—(Eighth Semester B.Arch./B.Arch.(ID)) —The In-semester evaluation done by internal/external examiners will be out of 300 marks. The End-semester viva-voce evaluation will be done by a jury consisting of one external examiner, Director/Thesis Coordinator and Guide. The End-semester evaluation will be out of 300 marks, with all the three jury members marking the student out of 100 marks each.

The grade awarded to the student will be on the basis of the total marks obtained by him/her out of 600.

3.3.5.2 Professional Training – (Ninth and Tenth Semester B. Arch./B.Arch.(ID)) — The evaluation for the Professional Training will be done at two stages, first at the end of the ninth semester and second at the end of the tenth semester.

The End-semester evaluation for both the stages of the Practical Training will be done for 150 marks for each stage and will be based on the reports submitted by the student as per the training manual.

The End-semester viva-voce evaluations at both the stages will be done by a jury consisting of two examiners – the Training Coordinator and the External Examiner, who will be a practicing architect. The evaluation for each stage will be out of 300 marks, with both the jury members evaluating the student for 150 marks each.

The grade awarded to the student will be on the basis of the total marks obtained by him/her out of 900.

3.3.6 The student performance in the sessional tests, assignments etc., shall be properly documented and announced/displayed on notice boards, within a week of the tests, etc.

3.3.7 The overall performance of a student in different courses (subjects) is expressed in terms of a Letter Grade (details in 3.7).

### **3.4 Class Committees**

#### **3.4.1 Constitution of the Class Committees**

A class committee for each semester of the B.Arch./B.Arch (ID) shall be constituted by the Director to consist of

Class coordinator : A senior member of the teaching faculty.

Members: Teachers of all courses of study.

Subject coordinator : If there are more sections than one, one of them will be nominated as subject coordinator.

#### **3.4.2 Functions of the Class Committee**

The class committee shall meet thrice in a semester. The first meeting will be held before the commencement of the semester in which the nature of the cycle of tests as well as broad assessment procedure for the different assignments/ tests will be decided. The second meeting will be held two weeks after the first cycle of tests to meaningfully interact and express opinions and suggestions to improve the effectiveness of the teaching - learning process and analyse the performance of the students in the tests. The class coordinator should send the minutes of the class committee meeting to the Director through the coordinator (academic affairs) immediately after the first two class committee meetings. The third meeting is to be held after one week of the second cycle of tests to assess the performance of the students.

### **3.5 Promotion to Higher Semesters — Academic Performance Requirements**

#### **3.5.A. B.Arch./ B.Arch(ID) Courses:**

3.5.A.1 Promotion of a student from an even semester to the next higher (odd) semester is subject to the minimum academic performance requirements as in 3.5.A.2.

- 3.5.A.2 A student earns the credits assigned to a subject, when he/she obtains an E or higher grade in that subject.

To be eligible for admission to the third semester, a student of B. Arch./B.Arch(ID) should have earned a minimum of 30 credits at the end of second semester.

To be eligible for admission to the fifth semester of the B. Arch./ B.Arch(ID) courses, a student should have earned a minimum of 75 credits at the end of the fourth semester.

To be eligible for admission to the seventh semester of the B. Arch. /B.Arch(ID) courses, a student should have earned a minimum of 125 credits at the end of the sixth semester.

To be eligible for admission to the ninth semester of the B. Arch./ B.Arch(ID) courses, a student should have earned a minimum of 175 credits at the end of the eighth semester.

**Note: A student of B. Arch. Course needs to earn full credits in the core subject of ARCHITECTURAL DESIGN/INTERIOR DESIGN for eligibility of promotion to the next academic year.**

- 3.5.A.3 A student, who is not eligible for promotion from an even semester to the next higher (odd) semester for reasons of not having earned the prescribed minimum number of credits, will be required to discontinue the academic programme temporarily. He/she can rejoin the academic programme after fulfilling the academic performance requirements as in 3.5.A.2.

- 3.5.A.4 A student who discontinues the academic programme for any reason and rejoins the programme at a later date, shall be governed by the rules, regulations, courses of study and syllabi in force at the time of his/her rejoining the programme.

### **3.5.B M. Arch. Course**

- 3.5.B.1 A student of M. Arch. can commence the Thesis work at the beginning of the fourth semester, but he/she has to earn all the credits of the first, second and third semesters, before he/she is permitted to submit the Thesis. Further, he/she should complete the course within the maximum period stipulated for the course.

### **3.6 Attendance Requirements**

- 3.6.1 Under the relative grading system a student must maintain an attendance record of at least 75% individually in all subjects. Attendance of studios, lectures, tests, practicals and tutorials all count towards the calculation of this attendance percentage.
- 3.6.2 Without the minimum attendance, students become ineligible to write the End semester examination in that subject and for subsequent grading.

- 3.6.3 A summer semester of six to eight weeks duration during summer vacation may be conducted for the students with attendance shortage due to genuine problems (at the discretion of the School). Maximum of three subjects may be permitted to a student during the summer semester depending on the availability of resources. The number of contact hours per week per subject will be eight to ten against three to four per subject in the regular semester. Thus the required forty to fifty classes per subject will be conducted in six to eight weeks. The evaluation process for summer semester will be same as that of the regular semester. There will be a regular internal evaluation and examination at the end of the summer semester. However, there will be no make up exam at the end of summer semester.
- 3.6.4 The aggregate percentage of attendance of the student during the semester will be entered in his / her grade sheet of that semester.

### **3.7 Evaluation Procedures**

#### **3.7.1 Continuous Assessment**

All courses undertaken by students are evaluated during the semester using internal system of continuous assessment. The student is evaluated on class tutorial participation, assignment work, lab work, class tests, midterm tests, quizzes, and end semester examinations, which contribute to the final grade awarded for the subject. Students will be notified at the commencement of each course about the evaluation methods being used for the course and weightages given to the different assignments and evaluated activities.

#### **3.7.2 Relative Grading**

Marks obtained in the in-semester and end-semester examinations are added together and a 10-point grading system will be used to award the student with an overall letter grade for the course (subject).

#### **3.7.3 Letter Grading System**

Final evaluation of course is carried out on a TEN POINT grading system. Performance Grades and Grade Points are as shown below.

<b>Grade</b>	<b>A<sup>+</sup></b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F(Fail)</b>
<b>Grade Points</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>0</b>

A student who earns a minimum of 5 grade points (E grade) in a course (subject) is declared to have successfully completed the course, and is deemed to be have earned the credits assigned to that course. A course successfully completed cannot be repeated.

A student should have appeared for the end-semester examination of the prescribed course of study (mere appearance in the continuous assessment tests is not sufficient) to be eligible for the award of the grade in the course.

Students who fail to appear for end-semester examination will be awarded an 'F' grade on the grade sheet. In exception to the above clause, those who fail to appear for end semester examinations due to genuine reasons are eligible for 'I' grade (incomplete). In all such cases, approval of the Director is necessary.

If a student is not eligible to appear in the end-semester examination owing to his/her not fulfilling the minimum attendance requirements in any subject, he/she has to fulfill the minimum attendance requirements by re-registering for those courses in which he/she had attendance shortage, at the next available opportunity.

#### 3.7.4 Grade Point Average (GPA) & Cumulative Grade Point Average (CGPA)

Each course grade is converted into a specific number of points associated with the grade as in 3.7.3. These points are weighted with the number of credits assigned to a course. The Grade Point Average (GPA) is the weighted average of Grade Points awarded to a student. The grade point average for each semester will be calculated only for those students who have passed all the courses of that semester. The weighted average of GPA's of all semesters that the student has completed at any point of time is the cumulative grade point average (CGPA) at that point of time.

CGPA up to any semester will be calculated only for those students who have passed all the courses up to that semester.

### Calculation of GPA and CGPA:

**Example:**

Courses	Credits	Letter Grade	Grade Value	Credit Value	Grade Points
Maths.	3	C	7	3 x 7	21
Chemistry	3	B	8	3 x 8	24
Physics	3	A	9	3 x 9	27
English	2	B	8	2 x 8	16
<b>Total</b>	<b>11</b>		<b>Total</b>		<b>88</b>

$$\text{In this case GPA} = \frac{\text{total grade points}}{\text{Credits}} = \frac{88}{11} = 8.0$$

Suppose the GPAs in two successive semesters are 7.0 and 8.0 with 26 and 24 respective course credits, then the

$$\text{CGPA} = \frac{7.0 * 26 + 8.0 * 24}{26 + 24} = \frac{374}{50} = 7.48$$

**Generally,**

$$\text{GPA} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i}, \quad \text{CGPA} = \frac{\sum_{j=1}^N \text{GPA}_j * \left( \sum_{i=1}^n C_i \right)_j}{\sum_{j=1}^N \left( \sum_{i=1}^n C_i \right)_j}$$

**Where,**

$n$  = number of courses

$C_i$  = course credits

$N$  = number of semesters

$G_i$  = corresponding grades

#### 3.7.5 Re-valuation of answer papers

A student may file an appeal for the revaluation of end semester examination by submitting an application along with the specified fee. The student will be able to see his/her answer paper and the scheme of evaluation on a scheduled date and if not satisfied with the assessment, he/she can request for revaluation. The revaluation fee will be refunded in case of any change in grade after revaluation.

#### 3.7.6 Re-registration

Students can re-register in one or more subjects of the previous semester/s in which they have F grade/s for improving internal assessment by paying the prescribed fees if these subjects are offered in the summer term. Students re-registered need to attend regular classes, sessional tests, submit assignments and maintain attendance requirements.

### 3.8 End-Semester Examination and Make-up (Supplementary) Examination

3.8.1 The examinations at the end of a particular semester will be conducted only in the subjects of the current semester. That is, at the end of the odd semester, examinations in the subjects of the odd semester only will be conducted. Similarly at the end of the even semester, examinations

will be conducted only in the subjects of the even semester. However, for the students of the final semester, the examination of odd semester subjects and even semester subjects will be conducted at the end of final semester.

3.8.2 Make-up examinations will be held at the end of the semester break to help the students who fail to secure 'E' or better grades in their regular attempt and also for those who missed regular examination due to valid reasons.

3.8.3 The cut-off marks for grades in the make-up examination will be the same as those in the regular end-semester examination. However, the maximum grade that will be awarded in subsequent examination to those students who were once awarded 'F' grade in any subject will be 'C'. Students who are awarded 'I' grade, however, are eligible for whatever grade they achieve in subsequent examination.

3.8.4 A separate minimum of 35% in the end semester examination is essential to pass in a subject.

### **3.9 Withholding of Results**

Results will be withheld when a student has not paid his/her dues or when there is a case of indiscipline pending against him/her.

### **3.10 Requirements for Graduation**

A student is deemed to have completed the requirements for graduation if he / she has:

- i. Fulfilled all minimum requirements of study and earned the number of credits specified in the prescribed courses of study.
- ii. Paid all dues to the Institute.
- iii. Has no case of indiscipline pending against him/her.

(THESE RULES AND REGULATIONS ARE SUBJECT TO CHANGE/ AMENDMENTS FROM TIME TO TIME, AS AND WHEN NEED ARISES.)

## B. CURRICULUM

### B. Arch. : Five Years Program

Proposed as per the Council of Architecture Minimum Standards for Architectural Education 2008 and incorporated from Academic Session 2010-2011.

	Subject Code	SUBJECT NAME	L/S	T	P	C		Subject Code	SUBJECT NAME	L/S	T	P	C
<b>FIRST</b>	<b>FIRST SEMESTER</b>						<b>SECOND SEMESTER</b>						
	ARC 101	Architectural Design I	6	0	0	6	ARC 102	Architectural Design II	6	0	0	6	
	ARC 103	Building Construction & Materials I	2	0	2	3	ARC 104	Building Construction & Materials II	2	0	2	3	
	ARC 105	Architectural Graphics I	2	0	2	3	ARC 106	Architectural Graphics II	2	0	2	3	
	ARC 107	History Of Architecture I	1	0	2	2	ARC 108	History Of Architecture II	1	0	2	2	
	ARC 109	Structures I	2	1	0	3	ARC 110	Structures II	2	1	0	3	
	ARC 111	Visual Arts & Basic Design I	4	0	0	4	ARC 112	Visual Arts & Basic Design II	4	0	0	4	
	ARC 113	Communication Skills	1	0	2	2	ARC 114	Society & Built Environment	1	0	2	2	
	ARC 115	Workshop Practice	1	0	2	2	ARC 116	Environmental Studies	1	0	2	2	
		<b>TOTAL</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>		<b>TOTAL</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>	
<b>SECOND</b>	<b>THIRD SEMESTER</b>						<b>FOURTH SEMESTER</b>						
	ARC 201	Architectural Design III	6	0	0	6	ARC 202	Architectural Design IV	8	0	0	8	
	ARC 203	Building Construction & Materials III	2	0	2	3	ARC 204	Building Construction & Materials IV	2	0	2	3	
	ARC 205	Architectural Graphics III	2	0	2	3	ARC 206	Surveying & Leveling	1	0	3	2	
	ARC 207	History Of Architecture III	1	0	2	2	ARC 208	History Of Architecture IV	1	0	2	2	
	ARC 209	Structures III	2	1	0	3	ARC 210	Structures IV	2	1	0	3	
	ARC 211	Building Services I	2	1	0	3	ARC 212	Building Services II	1	0	2	2	
	ARC 213	Principles Of Architecture	1	0	2	2	ARC 214	Climatology	2	1	0	3	
	ARC 215	Computer Aided Design	2	0	2	3	ARC 216	Landscape Architecture	2	0	0	2	
		<b>TOTAL</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>		<b>TOTAL</b>	<b>19</b>	<b>2</b>	<b>9</b>	<b>25</b>	
<b>THIRD</b>	<b>FIFTH SEMESTER</b>						<b>SIXTH SEMESTER</b>						
	ARC 301	Architectural Design V	10	0	0	10	ARC 302	Architectural Design VI	10	0	0	10	
	ARC 303	Building Construction & Materials V	2	0	2	3	ARC 304	Building Construction & Materials VI	2	0	2	3	
	ARC 305	Building Codes and Byelaws	1	0	2	2	ARC 306	Working Drawing	2	0	2	3	
	ARC 307	History Of Architecture V	1	0	2	2	ARC 308	History Of Architecture VI	1	0	2	2	
	ARC 309	Structures V	2	1	0	3	ARC 310	Structures VI	2	1	0	3	
	ARC 311	Building Services III	2	0	2	3	ARC 312	Specification & Estimation	1	0	2	2	
	ARC 313	Passive Environmental Architecture	1	0	2	2	ARC 314	Human Settlements	1	0	2	2	

		<b>TOTAL</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>		<b>TOTAL</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>
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	Subject Code	SUBJECT NAME	L/S	T	P	C		Subject Code	SUBJECT NAME	L/S	T	P	C
<b>FOURTH</b>	<b>SEVENTH SEMESTER</b>						<b>EIGHTH SEMESTER</b>						
	ARC 401	Architectural Design VII	10	0	0	10	ARC 402	Thesis	18	0	0	18	
	ARC 403	Interior Designing & Detailing	2	0	2	3	ARC 404	Professional Practice	2	1	0	3	
	ARC 405	Housing	2	0	1	3	ARC 406	Elective I	1	0	2	2	
	ARC 407	Principles of Urban Design	2	0	1	3	ARC 408	Elective II	1	0	2	2	
	ARC 409	Structures VII	2	1	0	3							
	ARC 411	Research Techniques	2	0	2	3							
		<b>TOTAL</b>	<b>20</b>	<b>1</b>	<b>6</b>	<b>25</b>		<b>TOTAL</b>	<b>22</b>	<b>1</b>	<b>4</b>	<b>25</b>	
<b>FIFTH</b>	<b>NINTH SEMESTER</b>						<b>TENTH SEMESTER</b>						
	ARC 501	Practice School – I : STAGE 1 (Professional Training)	-	-	-	25	ARC 502	Practice School – II : STAGE 2 (Professional Training)	-	-	-	25	
		<b>TOTAL</b>	-	-	-	25		<b>TOTAL</b>	-	-	-	25	

<b>ELECTIVE- II</b>		<b>ELECTIVE – III</b>	
ARC-406.1	Tall Buildings	ARC-408.1	Advanced Urban Design
ARC-406.2	Project Management & Valuation	ARC-408.2	Advanced Landscape Design
ARC-406.3	Energy Conscious Design	ARC-408.3	Architectural Conservation
ARC-406.4	Urban and Regional Planning	ARC-408.4	Traditional Architecture

L : Lecture, S : Studio, T : Tutorial, P : Practical

## C. DETAILED SYLLABUS

### 1<sup>ST</sup> YR. B. ARCH.

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#### FIRST SEMESTER

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#### 1] ARC 101 : ARCHITECTURAL DESIGN - I : [6 0 0 6]

**Course objectives:**

To make students understand about appreciation of visual form, grammar of visual language, appreciation of art, vocabulary of design, principles of composition, appreciation of massing and study of anthropometrics.

**Course contents:**

Principles of Visual perception, the grammar of visual language, principles of composition and relationship between the human activities and anthropometrics; Learning about taking independent decisions or analyze their observations with a sound background of basic principles of visual perception and the principles of composition; Continuous exposure of the student to the hypothetical as well as the real situations in which students are expected to work; Individual discussion about the project of work with students and on application of the principles in process of design; Instilling attitude of exploring different dimensions of composition without any restrictions and limitations; Understanding single user space.

**References:**

1. Broome, F. Gerald. (1974). *Elements of Design: Space*. Davis Publications Inc., Worcester, Massachusetts.
2. Wagenknecht, Kay and Herte. (1989). *Site + Sculpture – A collaborated design Process*. Van Nostrand Reinhold, NY.
3. Ching Francis. (1979). *Architecture Form, Space and Order*. Van Nostrand Reinhold Company, New York.
4. Neufert Ernst. (1970). *Architect's Data*. Crosby Lockwood and Sons, London.
5. Chiara JD and Calender. (1983). *Time Savers Standards for Building Type*. McGraw Hill Book Company, New York.
6. Allen, Edward and Iano, Joseph. (2006). *The Architect's Studio Companion: Rules of Thumb for Preliminary Design*. Wiley; 4<sup>th</sup> edition.
7. Frederick, Matthew. (2007). *101 Things I Learned in Architecture School*. The MIT Press.
8. Pearson, David. (2001). *New organic architecture: the breaking wave*. University of California Press.
9. Fawcett, Peter. (2003). *Architecture: design notebook*. Architectural Press, 2nd edition

#### 2] ARC 103 : BUILDING CONSTRUCTION AND MATERIALS – I : [2 0 2 3]

**Course objectives:**

To develop comprehension of standard graphic detailing techniques in architectural practice, and understanding of basic building materials, components, use and techniques for construction.

**Course contents:**

Introduction to graphic standards for architectural practice, relevance in building design and detailing; graphic techniques for drawing views, plans, elevations and sections, of building material and components as per standard architectural practice.

**Building Components & Construction Techniques:**

Brick & stone masonry in walls and arches; Brick masonry bonds – English, Flemish, Rat trap bond, decorative masonry bonds; Cavity wall construction; Stone masonry – coursed, random rubble, ashlar; Detailing of lintels; Simple foundations in masonry.

**Building Materials Study:**

Study of basic building materials like stone, brick, roof tile – their properties, manufacture, various quality tests towards certification for use; Specification of mortars in masonry; Plastering and pointing work.

**References:**

1. McKay, G.B. (1972). *Building Construction (Metric)*. Longman, London.
2. Foster, Stroud. (1963). *Mitchell's Advanced Building Construction*. Allied Publishers Private Limited, Bombay.
3. Gurucharan Singh. (1981). *Building Construction Engineering*. Standard Book House, New Delhi.
4. Dr.T.S.Balagopal Prabhu. (1987). *Building Drawing and Detailing*. Spades Publishers Pvt Ltd Calicut.
5. Chudley R. (1998). *Construction technology*. ELBS, England.
6. Ambrose James. (1987). *Building construction*. Van Nostrand Reinhold, New York
7. Rangwala S C. (1998). *Engineering materials*. Charotar Publishing House, Anand
8. Deplazes, Andrea. (2008). *Constructing Architecture: Materials, Processes, Structures*. Birkhäuser Basel.
9. Stephen Kieran, James Timberlake. (2004). *Refabricating architecture: how manufacturing methodologies are poised to transform building construction*. McGraw-Hill Professional.

**3] ARC 105 : ARCHITECTURAL GRAPHICS - I : [2 0 2 3]****Course objective:**

To understand the basics of plane and solid geometry through graphical exercises of increasing complexity.

**Course contents:**

Communication through graphic language; Geometrical construction; Lettering; Scales; Conic sections; Orthographic projection of points, lines, planes, solids; Pictorial representation like Isometric projection and Axonometric projection.

**References:**

1. Bhatt, N D. (2006). *Engineering Drawing*. Charotar Publishing House, Bangalore, India.
2. Gopalakrishna, K R. (2007). *Engineering Graphics*. Subhas Publications, Bangalore, India.
3. Mathur M L, Vaishwanar R S.(2009). *Engineering Drawing and Graphics*. Jain Brothers, New Delhi
4. Venugopal, K. (2005). *Engineering Drawing and graphics plus AutoCAD*. New Age International , New Delhi

**4] ARC 107 : HISTORY OF ARCHITECTURE - I : [1 0 2 2]****Course objectives:**

To understand the various factors which triggered the architectural advancement of a civilization, country or region and to study buildings and its elements, cities and its civic places, concept and theories covering various aspects of a civilization.

**Course contents:**

Detailed study and analysis of architectural building examples under the light of

- a) Genesis of seed idea
- b) Climatic and geographic influence

- c) Socio-political background, key people involved
- d) Construction technology and material
- e) Physical organization, typology
- f) Spatial understanding and
- g) Detailing

### **World History from Prehistory to Roman.**

Covering civilizations of Indus Valley, Central America, Egypt, Mesopotamia, Babylonia, Assyrian, Persian, Anatolian, Orient, Ancient Greece, Roman; This era focuses on the development of society, outgrowing cities and regions into a nation and overviews the various ideas depicting democracy and power of the monarchy.

### **References:**

1. Copplestone, Trewin (ed), (1979). *World Architecture*. The Hamlyn Publishing Group Limited, Toronto.
2. Fletcher, Sir Bannister. (1999). *History of Architecture – 20<sup>th</sup> edition*. Edited by Dan Cruickshank, CBS Publishers & Distributors, New Delhi.
3. Gympel, Jan. (1996). *The story of architecture*. Könemann Verlagsgesellschaft mbH, Köln, Germany.
4. Marian, Moffett et al. (2003). *World history of architecture*. Laurence King Publishing, London.
5. Conway, Hazel and Roenisch, Rowan. (2005) *Understanding architecture: an introduction to architecture and architectural history*. Routledge.
6. Marian Moffett, Lawrence Wodehouse and Michael Fazio. (2004). *A World History of Architecture*. McGraw-Hill Professional.
7. Roth, Leland. (2006). *Understanding Architecture: Its Elements, History, And Meaning*. Westview Press.

## **5] ARC 109 : STRUCTURES - I : [2 1 0 3]**

### **Course objective:**

To understand the structures in built environment and their relevance to architectural design.

### **Course contents:**

Introduction to fundamentals of structures for buildings; Classification of structures, overview of different types of structural systems used in architecture; Structural systems in nature; Building loads, effects on buildings, force systems, conditions for equilibrium; Elementary Analysis of structural response; Study of Geometric Properties of Structural Sections.

### **References:**

1. Mariam and Craige. (1987). *Statics*. John Wiley, New York.
2. Prasad, I. B. (1974). *Text Book of Applied Mechanics*. Khanna Publishers, Delhi.
3. Salvadori, Mario and Heller, Robert. (1963). *Structure in Architecture — the building of buildings*. Prentice-Hall, New Jersey.
4. Bhavikatti S S, Rajashekarappa K G. (2008). *Engineering Mechanics*. New Age International, Delhi
5. Popov Egor P, Balan Toader A. (2009). *Engineering Mechanics of Solids*. Pearson Education, Delhi
6. Ramamrutham S, Narayanan R. (1997). *Engineering mechanics*, Dhanopath rai, Delhi
7. Kumar K L. (2003). *Engineering mechanics*. Tata McGraw Hill, New Delhi
8. Shames Irving H. (2007). *Engineering mechanics*. Prentice Hall, Delhi

## 6] ARC 111 : VISUAL ARTS AND BASIC DESIGN STUDIO - I : [4 0 0 4]

### Course objectives:

To appreciate visual form and grammar; To understand design principles of 2D composition; To develop student skills in free hand drawing & sketching in various media.

### Course contents:

#### Visual Arts:

Various exercises in free hand drawings, sketching in coloring in different media like pencil, pen and ink; Study of human proportion, understanding the skill of sketching different postures of human figures, automobiles, interior furniture; Sculptures in different media like clay and plaster of paris.

#### Basic Design:

Principles of visual perception, grammar of visual language; Principles of composition like Contrast, Harmony, Rhythm, Proportion, Unity, etc; Visual and physical aspects of composition like Color, Texture, Form, Shape, etc; Application of design principles in two dimensional compositions.

### References:

1. Broomer F. Gerald. (1974). *Elements of Design: Space*. Davis Publications Inc., Worcester, Massachusetts.
2. Bruce D. Kurty. (1987). *Visual imagination – An introduction of Art*. Prentice Hall, New Jersey.
3. Hayashi, Studio. (1994). *Water Colour Rendering*. Graphic-Sha Publishing Co., Ltd.
4. Richard Rochan & Herald Linton. (1989). *Colour in Architectural Illustration*. Van Nostrand Reinhold.
5. Robert W. Gill. (1984). *Manual of Rendering in pen and ink*. Thames and Hudson, London.
6. Wong Wucius. (1977). *Principles of three dimensional Design*. Van Nostrand Reinhold, NY.
7. Wong Wucius. (1977). *Principles of two dimensional Design*. Van Nostrand Reinhold, NY.
8. Hanlon, Don. (2009). *Compositions in architecture*. John Wiley and Sons.
9. Saraswati, Baidyanath. (2001). *The nature of man and culture: alternative paradigms in anthropology*. Indira Gandhi National Centre for the Arts.

## 7] ARC 113 : COMMUNICATION SKILLS : [1 0 2 2]

### Course objective:

To train students in the language of English in the profession.

### Course contents:

Writing, public speaking and group discussion skills; Essay: Thesis statement-structure of the opening-concluding paragraphs-body of the essay-types of essays; Grammar: sentence structure-transformation of sentences-active, passive, direct – indirect; Reading comprehension Idiomatic expressions; Vocabulary: Synonyms – antonyms-one word substitution-confused pairs of words; Expansion of an idea (150-200 words); Business correspondence: letter writing formal-drafting; Report writing-formal drafting Communication/Public speaking, group discussions.

Tutorials, Group Discussions, Presentation Skills, Listening Skills.

### References:

1. Green, David. (2004). *Contemporary English Grammar, Structures and Composition*. Macmillan Publications, Chennai.
2. Turton Nigel D. and Heaton John Brian. (1996). *Longman Dictionary of Common Errors.*, 2<sup>nd</sup> edn, Pearson Education Limited.
3. McCarthy, Michael. (2004). *English Idioms in Use 2002*. Cambridge University Press, London.
4. Jones, Daniel. (2005). *English Pronouncing Dictionary*. ELBS, London.

5. Tickoo, Champa and Sasikumar, Jaya. (1991). *Writing with a Purpose*. Oxford University Press, Bombay.
6. Quirk, Charles Randolph and Greenbaum, Sidney. (1979). *University Grammar of English*, Longman. London.

## 8] ARC 115 : WORKSHOP PRACTICE : [1 0 2 2]

### Course objectives:

To train students in the practice of wood working through understanding of joinery, and Model making for various built forms and variety of materials.

### Course contents:

Introduction to various hand tools by performing various operations of carpentry and by preparing models of various joints and its uses; Application of welding and other joints in architectural field; Demonstration of wood carving; Various types of architectural models, different materials for making models, exercises on making of models.

### References:

1. Burbank, Nelson. (1986). *House Carpentry Simplified*. McGraw Hill Publications, NY.
2. Hajra Choudhury. (1998). *Workshop Technology, Vol 1*. Media Promoters & Publishers P. Ltd, Bombay.
3. Krendlise L.N. (1984). *Wood working*. MIR Publications, Moscow.
4. Readers Digest (1983- 1990). *Readers digest complete guide to home improvements*.

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## SECOND SEMESTER

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## 1] ARC 102 : ARCHITECTURAL DESIGN – II : [6 0 0 6]

### Course objectives:

The objectives of this course is to understand the process of appreciating and designing built forms, understanding the concept of shelter, study of user circulation, the measure of space, designing simple building typologies in a presentable form.

### Course contents:

Extension of the compositional principles already taught in the earlier design studio; Ideal design methodology; Understanding user circulation and space requirements; Taking up design of small uncomplicated spaces using the ideal-design methodology; Exploration of various methods of presentation; including the construction of 3-dimensional scaled models; Emphasis on visual design.

### References:

1. Ching Francis. (1979). *Architecture Form, Space and Order*. Van Nostrand Reinhold Company, New York.
2. *The National Building Code*. (2000). IS Publications, India.
3. *IS Code Reference Manual for the Building Design for Physically Handicapped*.
4. Neufert Ernst. (1970). *Architect's Data*. Crosby Lockwood and Sons, London.
5. Chiara JD and Calender. (1983). *Time Savers Standards for Building Types*. McGraw Hill Book Company, New York
6. Allen, Edward and Iano, Joseph. (2006). *The Architect's Studio Companion: Rules of Thumb for Preliminary Design*. Wiley; 4 edition.
7. Frederick, Matthew. (2007). *101 Things I Learned in Architecture School*. The MIT Press.
8. Pearson, David. (2001). *New organic architecture: the breaking wave*. University of California Press.

9. Fawcett, Peter. (2003). *Architecture: design notebook*. Architectural Press, 2nd edition.

## 2] ARC 104 : BUILDING CONSTRUCTION AND MATERIALS – II : [2 0 2 3]

### Course objectives:

The comprehension of detailing of pitched roofs; Detailing of doors and windows in timber; Understanding of the material properties and application of wood, ceramic and glass in building construction.

### Course contents:

#### Construction Detailing:

Pitched roofs in timber - types /classification, trusses in timber as roofing structures, classification, detailing of roofs using roof tile, sheets roof coverings; Doors and windows in timber: Technical terms, classification, windows, ventilators, doors and windows hardware /fixtures; Geometrics of Staircases.

#### Building Materials Study:

Timber classification, manufacture/processing for building application, seasoning methods, defects / preservation techniques , fire resistance, tests for suitability for use in buildings; Industrial timber products - Block board, plywood, particle board, fiberboard, laminates, veneers, properties / application as building materials; Glass & Ceramics- as a building material – classification, manufacture, properties and applications.

### References:

1. McKay, G.B. (1972). *Building Construction (Metric)*. Longman, London.
2. Foster, Stroud. (1963). *Mitchell's Advanced Building Construction*. Allied Publishers Private Limited, Bombay.
3. Gurucharan Singh. (1981). *Building Construction Engineering*. Standard Book House, New Delhi.
4. Dr.T.S.Balagopal Prabhu. (1987). *Building Drawing and Detailing*. Spades Publishers Pvt Ltd Calicut.
5. Chudley R. (1998). *Construction technology*. ELBS, England.
6. Ambrose James. (1987). *Building construction*. Van Nostrand Reinhold, New York
7. Rangwala S C. (1998). *Engineering materials*. Charotar Publishing House, Anand
8. Deplazes, Andrea. (2008). *Constructing Architecture: Materials, Processes, Structures*. Birkhäuser Basel.
9. Stephen Kieran, James Timberlake. (2004). *Refabricating architecture: how manufacturing methodologies are poised to transform building construction*. McGraw-Hill Professional.
10. Sushil Kumar. (1991). *Building Construction*. Standard Publishers and Distributors, New Delhi.

### 3] ARC 106 : ARCHITECTURAL GRAPHICS – II : [2 0 2 3]

#### Course objective:

To understand solid geometry through graphic exercises of increased complexity.

#### Course contents:

Sections of solids; Auxiliary views; True shapes of sections; Development of surfaces; Interpenetration of solids; Perspective projection of simple geometrical objects.

#### References:

1. Bhatt, N D. (2006). *Engineering Drawing*. Charotar Publishing House, Bangalore, India.
2. Gopalakrishna, K R. (2007). *Engineering Graphics*. Subhas Publications, Bangalore, India.
3. Mathur M L, Vaishwanar R S.(2009). *Engineering Drawing and Graphics*. Jain Brothers, New Delhi
4. Venugopal, K. (2005). *Engineering Drawing and graphics plus AutoCAD*. New Age International , New Delhi
5. Mathur M L , Vaishwanar R S. (2009). *Engineering Drawing and Graphics*. Jain Brothers, New Delhi
6. Yee, Rendow. (2007). *Architectural Drawing: A Visual Compendium of Types and Methods*. Wiley; 3 edition.
7. Ching, Francis D. K. (2009). *Architectural Graphics*, Wiley

### 4] ARC 108 : HISTORY OF ARCHITECTURE - II : [1 0 2 2]

#### Course objectives:

To understand the various factors which triggered the architectural advancement of a civilization, country or region and to study buildings and its elements, cities and its civic places, concept and theories covering various aspects of a civilization.

#### Course contents:

Detailed study and analysis of architectural building examples under the light of

- a) Genesis of seed idea
- b) Climatic and geographic influence
- c) Socio-political background, key people involved
- d) Construction technology and material
- e) Physical organization, typology
- f) Spatial understanding and
- g) Detailing

#### World history from Early Christian to Baroque.

Covering early Christian, Byzantine, Romanesque, Gothic, and Renaissance till Baroque; Focus of this era on the development of society, outgrowing cities and regions into a nation; Key factor of religion as a new power for rationalizing and development of a society.

#### References:

1. Copplestone, Trewin (ed). (1979). *World Architecture* The Hamlyn Publishing Group Limited, Toronto.
2. Fletcher, Sir Bannister. (1999). *History of Architecture – 20<sup>th</sup> edition*. edited by Dan Cruickshank, CBS Publishers & Distributors, New Delhi.
3. Gympel, Jan. (1996). *The story of architecture*. Könemann Verlagsgesellschaft mbH, Köln, Germany.
4. Marian, Moffett et al. (2003). *World history of architecture*. Laurence King Publishing, London.
5. Conway, Hazel and Roenisch, Rowan. (2005). *Understanding architecture: an introduction to architecture and architectural history*. Routledge.
6. Marian Moffett, Lawrence Wodehouse and Michael Fazio. (2004). *A World History of Architecture*. McGraw-Hill Professional.

## 5] ARC 110 : STRUCTURES – II : [2 1 0 3]

### Course objective:

Study of structural response of structural elements in buildings.

### Course contents:

Study of stress and strain in building materials; Structural behavior of beams, shear force, bending moment; Theory of simple bending, elementary stress analysis for bending and shear; Concept of flitched beam and analysis of deflections in beam.

### References:

1. Ramamrutham S, Narayana R. (2003). *Strength of Materials*. Dhanpat Rai and Sons, Delhi.
2. Basavarajaiah, B.S. and Mahadeveappa, P. (2001). *Strength of Materials*. CBS Publishers, New Delhi.
3. Bhavikatti S S. (2008). *Strength of Materials*. Vikas Publishing House, New Delhi
4. Rao D S Prakash. (2009). *Introduction to Strength of materials*. Universities press, Hyderabad
5. Ryder G H. (2000). *Strength of Materials*. Macmillan, Delhi
6. Raju Krishna N, Kumar N S. (2002). *Strength of Materials*. Gangaram publishers, Bangalore

## 6] ARC 112 : VISUAL ARTS AND BASIC DESIGN STUDIO – II : [4 0 0 4]

### Course objectives:

To understand design principles of 3D composition and study of volumes; To understand color theory; To develop skills in various rendering media.

### Course contents:

#### Visual Arts

Introduction to colour theory, colour wheel, primary colours, secondary colours, tertiary colours, understanding complimentary colours; Skill development exercises in drawing and painting to enhance rendering techniques in pencil, pen and ink and colour; Free hand perspective drawings of interiors and exteriors; Develop skills in scale and proportion.

#### Basic Design

Exercises of volumes like - addition and subtraction, composition of geometrical volumes; Relief and Recess, positive and negative space; Models, Sculpture and Mural designs.

### References:

1. Bruce D. Kurty. (1987). *Visual imagination – An introduction of Art*. Prentice Hall, New Jersey.
2. Gill, Robert W. (1984). *Manual of Rendering in pen and ink*. Thames and Hudson, London.
3. Harh, Fredrick. (1976). *Art: A History Painting, Sculpture and Architecture*. HN Abrams, NY.
4. Hayashi Studio. (1994). *Water Colour Rendering*. Graphic-Sha Publishing Co., Ltd.
5. Hanlon, Don. (2009). *Compositions in architecture*. John Wiley and Sons.
6. Saraswati, Baidyanath. (2001). *The nature of man and culture: alternative paradigms in anthropology*. Indira Gandhi National Centre for the Arts.

## 7] ARC 114 : SOCIETY AND BUILT ENVIRONMENT: [1 0 2 2]

### Course objective:

To understand issues related to society and economics and study them with relevance to built environment.

### Course contents:

Introduction to sociology and its relationship with architecture; Urbanization in India, problems of slum, migration, problems related to public health, communication reforms and housing; Principles of social research; Study of social problems in urban and rural context, bio-social and socio-cultural systems; Introduction to Building Economics, nature and scope of the subject of building economics, utility to architects, economic problems; Factors of production, Inflation and Building Cost, wages and incentives, Energy Crisis and building construction; Introduction and need for an architect to understand basics of psychology; Environmental Perception, Cognition and Memory  
Ambient Environments; Personal Space and Territoriality, Privacy and Crowding.

**Reference books:**

1. Rapoport, Amos. (1969). *House form and culture*. Prentice Hall, New Jersey.
2. Maclver, R.M. and Page, Charles. (1974). *Society: An introductory Analysis*. McMillan India Limited, Delhi.
3. Madhan G.R. (1981). *Indian Social Problems, Vol.1*. Allied Publishers, New Delhi.
4. Namavati. (1991). *Professional Practice and Methods of Valuation*. Mumbai.
5. Baidynath, Saraswati. (2000). *Nature of Man and Culture*. Aryan Books International, Delhi.
6. Lester, Thurow. (2003). *Fortune Favours the Bold*. Harper Business, New York.
7. Sinha, Ramnandan P. *Environment and human response*. Concept Publishing, Delhi.
8. Jain, Uday. (1987). *Psychological consequences of crowding*. Sage, New Delhi.
9. R. Bechtel & A. Churchman. *Handbook of Environmental Psychology (2<sup>nd</sup> ed)*. New York, Wiley.
10. Gifford, Robert. (1997). *Environmental Psychology: Principles and practice*. Optimal books.
11. Robert B. Bechtel, Arza Churchman. (2002). *Handbook of Environmental Psychology*. New York, Wiley.

**8] ARC 116 : ENVIRONMENTAL STUDIES : [1 0 2 2]**

**Course objective:**

To make students aware of the environmental issues related to development.

**Course contents:**

Basic components of the environment: Various spheres of the earth, internal structure of the earth;  
Ecosystem: Structure and functions of the ecosystem, Ecological succession, Threats to major ecosystems; Biodiversity and its conservation: Importance of biodiversity to mankind, Factors affecting Biodiversity, Threats to biodiversity, Conservation of biodiversity; Natural resources: Forest, water, mineral, land and food resources of India, conservation and management; Environmental pollution and control: Air pollution, Water pollution, Soil pollution, Noise pollution –sources, characteristics, sampling, analysis and measurement, various pollution control measures; Solid waste and hazardous waste management- sources, characteristics and control measures of urban and industrial wastes, environmental problems and health risks caused by hazardous waste;  
Environmental concerns: Urbanization, Industrialization, Agricultural revolution – their impact on the environment, consequences like global warming, ozone layer depletion and acid rain;  
Environment Impact Assessment: Evolution and history, procedures and practices, Sustainable energy and development: Conventional Energy Sources, Non-Conventional Energy Sources, Hydrogen as future energy source, Energy Conservation and Management, Energy auditIndustrial and Building energy management;  
Disaster Management:  
Types of natural and manmade disasters: their characteristics, causes and impacts; Disaster preparedness – Various plans of action for probable disasters, Early warning systems; Disaster mitigation- Identification and evaluation of hazards/risks, role of IT, Remote Sensing and GIS, GPS in disaster mitigation; Response - Search and rescue, Mobilization of the necessary emergency services, Coordination of rescue, basic humanitarian needs; Recovery - Restoration of the affected area and people to its previous state, Reconstruction and Rehabilitation.

Tutorials includes Field trips; Seminars, group discussions, video shows related to environment.

**References:**

1. P Venugopal Rao. (2008). *Principles of Environmental Science and Engineering*. Prentice Hall of India Private Limited, New Delhi
2. Anil Kumar De and Arnab Kumar De. (2007). *Environmental Studies*. New Age International Publishers, New Delhi.
3. Erach Bharucha. (2005). *Text book of Environmental Studies for undergraduate courses*. Universities Press, Hyderabad
4. Benny Joseph. (2009). *Environmental Studies*, 2<sup>nd</sup> edition. Tata McGraw-Hill Publishing Company Ltd., New Delhi
5. Goel SL and Kumar R. (2001). *Disaster management*. Deep and Deep publications.

## **2<sup>ND</sup> YR. B. ARCH.**

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### **THIRD SEMESTER**

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#### **1] ARC 201 : ARCHITECTURAL DESIGN - III : [6 0 0 6]**

**Course objectives:**

The objective of this course is to train student in design development of moderate complexity through understanding and appreciation of space and functional requirements such as circulation, facilitation and area analysis, with particular stress on techniques of graphic representation as an integrated process in architectural design. Basics of technical drawings are to be adhered strictly.

**Course contents:**

Introduction of exercises interconnecting basic design and architectural design; Understanding the arrangement of solids for aesthetic consideration to foster basic architectural qualities in design like composition and other human considerations like, privacy, convenience, comfort, etc.; Understanding the significance of the factors in creating ideal environment; Learning the design process; Critical appraisal of spaces to which students are frequently exposed to like library, classroom, hostel residence, clinic, etc.; Factors like aesthetics – color, texture, arrangement and profile of forms, circulation pattern, furniture arrangement, etc.

A small design exercise with critical appraisal of various spaces as first assignment; other design problems involving activities for two to twenty persons.

**References:**

1. Ching Francis. (1979). *Architecture Form, Space and Order*. Van Nostrand Reinhold Company, New York.
2. Neufert Ernst. (1970). *Architect's Data*. Crosby Lockwood and Sons, London.
3. Chiara JD and Calender. (1983). *Time Savers Standards for Building Types*. McGraw Hill Book Company, New York.
4. Kolarevic, Branko. (2003.). *Architecture in the digital age: design and manufacturing*. Taylor & Francis.
5. Vesely, Dalibor. (2004). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. MIT Press.

#### **2] ARC 203 : BUILDING CONSTRUCTION AND MATERIALS – III : [2 0 2 3]**

**Course objectives:**

To develop an understanding of design and construction detailing of Stairs, Timber Floors, Foundations and Temporary Constructions.

**Course Contents:****Construction Detailing:**

Floors - timber floors - single, double joist floors, jack arch floors; Stairs - definition design issues, Construction methods of timber, metal/RCC/masonry stairs; Wooden stairs - Types, construction details, support systems, baluster and handrail fixing. Metal stairs - Types and construction details of MS (mild steel) staircases, Stone and masonry stairs - types, support systems, construction details; Simple foundation (masonry), spread footing, RCC foundation, classification - shallow foundation, Principles, isolated – combined and grillage footing; Deep Foundation – Pile foundation – types – methods of construction and bearing – friction – sheet piles; Temporary constructions, Timbering for trenches – shoring – underpinning – scaffolding - form-work for RCC column and beam, slab, stairs.

**Building Materials study:**

Types of flooring finishes - mosaic, marble, stone etc.; Ferrous and non-ferrous metals - iron, steel, alloys, various forms and their applications in buildings - aluminum, copper, zinc, lead, tin; Polymeric materials, plastics, rubbers, Asbestos products.

**References:**

1. McKay, G.B. (1972). *Building Construction (Metric)*. Longman, London.
2. Foster, Stroud. (1963). *Mitchell's Advanced Building Construction*. Allied Publishers Private Limited, Bombay.
3. Gurucharan Singh. (1981). *Building Construction Engineering*. Standard Book House, New Delhi.
4. Dr.T.S.Balagopal Prabhu. (1987). *Building Drawing and Detailing*. Spades Publishers Pvt. Ltd., Calicut.
5. Sushil Kumar. (1991). *Building Construction*. Standard Publishers and Distributors, New Delhi.
6. Chudley R. (1998). *Construction technology*. ELBS England.
7. Ambrose James. (1987). *Building construction*. Van Nostrand Reinhold, New York
8. Rangwala S C. (1998). *Engineering materials*. Charotar Publishing House, Anand
9. *Relevant IS Codes*.

**3] ARC 205 : ARCHITECTURAL GRAPHICS - III : [2 0 2 3]****Course objectives:**

To introduce the purpose and techniques of perspective drawing; To develop the graphic representation skills of shades and shadows on 2 dimensional drawings and in perspective drawings.

**Course contents:**

Understanding the basis and importance of perspective drawings in architecture; Methods and techniques of drawing 1-point and 2-point perspectives of exteriors and interiors of different building types; Importance of light and shade in architectural drawings; Methods and conventions of representing shades and shadows in plan, elevation and views; Methods applied to represent shades and shadows in perspective drawings; Rendering techniques of perspective drawing including shades and shadows; Depicting tonal variations in drawings to represent material variations, shades and shadows; Using different media (color and black and white) to render plans, elevations and perspectives.

**References:**

1. Ching, Francis D.K. (1996). *Architectural Graphics*. Third Edition, Van Nostrand Reinhold.
2. Gill, Robert .W. (1991). *Manual of Rendering with Pen and Ink*. Thames and Hudson.
3. Halse, Albert. (1988). *Architectural Rendering*. McGraw Hill Book Co., NY.
4. Michael. E. Helms. (1990). *Perspective Drawing, A step-by-step handbook*. Prentice Hall, Eagle Wood Cliff, New Jersey.
5. Mulik, Shankar. (1994). *Perspective and Sciography.*, Allied Publishers Limited, Bombay.

## 4] ARC 207 : HISTORY OF ARCHITECTURE - III : [1 0 2 2]

### Course objectives:

To understand the various factors which triggered the architectural advancement of a civilization, country or region and to study buildings and its elements, cities and its civic places, concept and theories covering various aspects of a civilization.

### Course contents:

Detailed study and analysis of architectural building examples under the light of

- a) Genesis of seed idea
- b) Climatic and geographic influence
- c) Socio-political background, key people involved
- d) Construction technology and material
- e) Physical organization, typology
- f) Spatial understanding and
- g) Detailing

### History of Architecture in the Northern Mainland of India.

Indus valley civilization - Covering achievement of a society and study of well planned and modern cities designed about 3000 years ago; Buddhist and Jain architecture, establishment of Buddhist school, its significance and contribution; Study of various methods of Buddhist architectural forms such as Stupas, Rock Cut Temples, Chaitya halls and Vihara; Hindu temple architecture ; Study of evolution of Indo Aryan temple architecture, study of architectural features such as Vimana, Sikhara, Garbhagriha, Mandapa, etc; Study of construction methods and planning under various dynasties / regions such as Orissa group, Khajuraho group, Central India, Gujarat and Rajasthan.

### References:

1. Brown, Percy. (1976). *Indian Architecture (Buddhist and Hindu period)*. 7<sup>th</sup> reprint, Taraporevala Sons & Co. Pvt. Ltd. Mumbai.
2. Fergusson, James. (1997). *History of Indian and Eastern Architecture, revised and edited with additions, Indian architecture by James Burgess and Eastern architecture by R. Phene Spiers, reprint, vol. I and vol. II*. Low Price Publications, Delhi.
3. Fisher, Robert E. (1993). *Buddhist Art and Architecture*. Thames and Hudson Ltd, London.
4. Grover, Satish. (2003). *Buddhist and Hindu Architecture in India, 2<sup>nd</sup> edition*. CBS publishers and distributors, New Delhi.
5. Deva, Krishna. (1995). *Temples of India, vol. I and II*. Aryan books international, Delhi.
6. Marian Moffett, Lawrence Wodehouse and Michael Fazio. (2004). *A World History of Architecture*. McGraw-Hill Professional, ISBN-10: 0071417516
7. Roth, Leland. (2006). *Understanding Architecture: Its Elements, History, And Meaning*. Westview Press, ISBN-10: 0813390451

## 5] ARC 209 : STRUCTURES - III : [2 1 0 3]

### Course objective:

The objective of this course is to understand the behavior of columns and indeterminate structures.

### Course contents:

Short columns, behaviour under axial and eccentric loads, Euler's and Rankine's method for long columns; Introduction to indeterminate structures, analysis of fixed, continuous beams; Clapeyron's theorem of three moments, application to continuous beams, drawing shear force and bending moment diagrams; Moment distribution method of analyzing indeterminate structures, application to solve continuous beams, single bay single storey portal frames.

**References:**

1. Ramamrutham S , Narayan R. (2008). *Theory of structures*. Dhanpat Rai Publishing Company Pvt.Ltd., New Delhi.
2. C.K.Wang.(1983). *Indeterminate Structural Analysis*. McGraw Hill Book Company, Delhi
3. R.S.Khurmi. (2004). *Theory of Structures*. S.Chand and Company Limited, New Delhi.
4. Rao D S Prakash. (2007). *Structural Analysis.*, Universities press, Hyderabad
5. Bhavikatti S S. (2008). *Structural Analysis*. Vikas Publishing house, Delhi
6. Reddy C S. (2003). *Basic structural analysis*. Tata McGraw Hill, New Delhi
7. Pandit G S;others. (2003). *Theory of Structures*, Mc Graw Hill, New Delhi

**6] ARC 211 : BUILDING SERVICES - I : [2 1 0 3]****Course objectives:**

To understand the working of services in buildings and their integration in design; To gain knowledge of the basic services of water supply, sanitation systems, rain water disposal and fire suppression systems in buildings.

**Course contents:****Water Supply:**

General ideas of sources of water supply, qualitative and quantitative aspects, impurities, hard and soft water treatment and distribution systems; Domestic water supply systems, sump, overhead tank; Pipe sizes, pipe fittings — their technical names, viz, coupling, tee, elbow, bend, gate valve, non return valve and latest fittings in the market; Cold water and hot water supply for multistoried buildings; Types of taps, types of valves, etc.

**Sanitation:**

Refuse, types, collection and disposal; Basic principles of sanitation and disposal of waste water from buildings; Urban and rural drainage and sanitation; Different collection and disposal fittings; A brief on sewage treatment, septic tanks, oxidation ponds, soak pits, aqua privy, manholes, inspection chambers, intercepting chambers, cast iron manholes; Self-cleaning velocity, drains on sloping sites, sub-soil drainage, garage drainage and lay-out of simple drainage systems and testing of drains; Sewers, materials, workmanship, laying and testing of sewers, clearing of sewers, surface drains, ventilation of sewers, storm water drainage system; Recycling of black water.

**Rain Water Disposal:**

Storm water drainage systems for buildings, Rain Water Harvesting.

### **Fire Suppression Systems:**

Suppression agents - Types of fire; Suppression systems - water supplies, fire fighting tanks – Wet Riser, Dry Riser; Hydrant systems - Automatic sprinkler systems.

Site Visits: Water treatment plant, sewage treatment plant, and multistoried apartments, for studying water supply, sanitary arrangements and fire fighting provisions.

### **References:**

1. Birdie J.S. and Birdie G.S. (1998). *Water Supply and Sanitary Engineering*. Dhanpathray Publishing Company, New Delhi.
2. Burke, Ken. (1982). *Basic Plumbing Techniques*. Ortho Books, Chevron Chemical Company, San Ramon, Canada.
3. Hussain, S.K. (1982). *Water Supply and Sanitary Engineering*. Dhanpatray and Sons, New Delhi.
4. Rangwala, S.C. (1969). *Fundamentals of Water Supply and Sanitary Engineering*. Charotar Publishing Company, Anand.
5. Wise, Alan Frederick Edward & Swaffield, J.A. (2002). *Water, Sanitary & waste Services for Building, 5<sup>th</sup> edn*. Butterworth-Heinemann, Oxford.
6. National Building Code of India.

## **7] ARC 213 : PRINCIPLES OF ARCHITECTURE : [1 0 2 2]**

### **Course objectives:**

To explore the evolution of design thinking, process and methodology, and to undertake and understand the critical appraisal of buildings and design.

### **Course contents:**

Origin and development of architecture. Role of graphics in concept representation and creative thinking; Representation techniques and skill development of graphics; Design process experiments in history, design thinking, documentation of design process and chart of design methodologies followed by various architects and designers, Perception of space, Interpretations of space, Elements of design, Art and their principles of composition; Elements of design like color, texture, light and shade, pattern in design, geometry of various shapes and their meaning in design. Tools of composition like unity, mass and form, contrast, harmony, symmetry and asymmetry, positive and negative spaces, scale and proportions, which could be understood by analyzing Indian and foreign buildings in history. Character definition of design through relationship of function in expression of design like, expression of climate and topography, expression of culture and regional characters, expression of circulation and function of building, expression of structure and technology in design. Styles in Architecture: Determinants of style are region, climate, sociology, politics, scientific inventions, materials and technology. Discussion of these influences in development of styles in history. Environmental behavior theory: proxemic theories, theories related to environment and behavioral analysis and its application in design. Architectural Criticism: Importance of criticism in architecture, its role and ethics involved. Types of criticism like- normative, interpretive, and descriptive. Settings for criticism in present context and in history.

### **References:**

1. Lawson Bryan. (1980). *How designers think*. Butterworth Architecture.
2. Smithies K W. (1981), *Principles of design in architecture*. Van Nostrand Reinhold.
3. Simon Unwin. (1997). *Analyzing Architecture*. Routledge London & New York.
4. Francis D.K.Ching. (2000). *Architecture-Form, Space and Order*. Litton Educational Publishing Inc., Van Nostrand Reinhold Company, London.
5. Richard Padoram, E & FN SPON. (1999). *Proportion, Science Philosophy Architecture*. Taylor and Francis Group, Routledge, New York and London.
6. Johnson Paul Alan. (1994). *Theory of Architecture*. John Wiley and Sons, New York.

7. Vatsyayan, Kapila. (2003). *The Square and the Circle of the Indian Arts*. Abhinav Publications.
8. Meiss, von Pierre. (1990). *Elements of Architecture: From Form to Place*. Routledge; New edition.
9. Unwin, Simon. (2009). *Analysing architecture*. Taylor & Francis, 3rd edition illustrated
10. V.S.Parmar. (1990). *Design Fundamentals*. Somaiya Publications Private Limited, New Delhi
11. John Lang. (1987). *Creating Architectural Theory*. Van Nostrand Reinhold Company, New York
12. Christian Norberg – Schulz. (1971). *Existence, Space and Architecture*. Studio Vista Limited, London
13. Richard Padoram, E & FN SPON. (1999). *Proportion, Science Philosophy Architecture*. Taylor and Francis Group, Routledge, New York and London
14. Wilson, Colin St.John. (1992). *Architectural Reflections Butterworth Architecture*. Oxford
15. Hubbard, William. (1980). *Complicity and Conviction: Steps Towards an Architecture of Convention*. The MIT Press, Mass
16. Baker, Geoffrey. (1989). *Design Strategies in Architecture an approach to the analysis of Form*. E & FN spon, N.Y.
17. Frampton Kenneth; Glusberg Jorge. (2000). *World Architecture 1900-2000*. Springer Wien, New York
18. Bellantyne Andrew. (2002). *What is Architecture?* New York
19. Unwin Simon. (2000). *Architecture note book*. Routledge, London
20. Pandya Yatin. (2007). *Elements of Space Making*. Mapin Publications, Ahmedabad.

## **8] ARC 215 : COMPUTER AIDED DESIGN : [2 0 2 3]**

### **Course objective:**

The objective of this course is to impart training in the use of CAD techniques in Architectural design and detailing, production of 3D Building Models, walkthrough, virtual reality, etc.

### **Course contents:**

Overview of CAD in Architecture; introduction to various CAD software in Architectural application, drawing commands, dimensioning, modify commands, working in layers, concept of 3D modeling, primitives, Boolean techniques, multiple viewports, etc.; Use of Building Information Modelling (BIM) software, use of intelligent parametric objects like wall, door, slab, roof, etc.; Creation of building 3D model, generating plan, elevation, sections, scheduling, etc.; Creation of building walkthrough, Rendering, Virtual reality, etc.

**Reference books:** *CAD manuals*.

## **FOURTH SEMESTER**

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### **1] ARC 202 : ARCHITECTURAL DESIGN - IV : [8 0 0 8]**

#### **Course objectives:**

The objective of this course is to understand the nature and interdependency of multi function spaces and their effect on visual, aesthetic and structural elements.

#### **Course contents:**

Volumetric study of built forms; Various building materials & their application in architectural design; Critical appraisal of both internal and external spaces, evaluation of contemporary architectural works as warm up exercises; Design problems of relatively complex nature to be worked out with exposure to case study and literature study; Design exercises for various climatic zones; A short study tour of two to four days to study the built forms in various regions; The design exercise is to address undulating nature of site (urban/rural); study of contours and related challenges; Three dimensional presentation (in perspective model on computer graphics).

**References:**

1. BIS. (2005). *The National Building Code of India, SP:7*. Bureau of Indian Standards, New Delhi.
2. BIS. (1987). *Recommendations for Buildings and facilities for the Physically Handicapped*. Bureau of Indian Standards.
3. Chiara, J. D. and Calender. (1983). *Time Savers Standards for Building Types*. McGraw Hill Book Company, New York.
4. Ching, Francis D. K. (1979). *Architecture Form, Space and Order*. Van Nostrand Reinhold Company, New York.
5. Neufert, Ernst. (1970). *Architect's Data*. Crosby Lockwood and Sons, London.

**2] ARC 204 : BUILDING CONSTRUCTION AND MATERIALS – IV : [2 0 2 3]****Course objectives:**

To develop an understanding of design and detailing issues of RCC constructions.

**Course Contents:****Construction Detailing:**

RCC detailing and construction practices for framed structures – design issues of RCC structural grid; Layout – detailing for RCC column, beams and slabs; RCC stairs - types and construction details of RCC cast-in situ stairs - pre-cast steps, fixing of handrails.

Special doors - sliding, sliding and folding, collapsible shutters, rolling shutter, fire resistant steel doors.

**Building Materials study:**

Cement Concrete for PCC and RCC work; Plastics; Bitumen and Asphalt; Gypsum; Paints.

**References:**

1. Foster, Stroud. (1963). *Mitchell's Advanced Building Construction*. Allied Publishers Private Limited, Bombay.
2. Gurucharan, Singh. (1981). *Building Construction Engineering*. Standard Book House, New Delhi.
3. McKay, G.B. (1972) *Building Construction (Metric)*. Longman, London.
4. Prabhu, Balagopal T.S. (1987). *Building Drawing and Detailing*. Spades Publishers Pvt. Ltd., Calicut.
5. *Relevant IS codes*.
6. Sushil Kumar. (1991). *Building Construction*. Standard Publishers and Distributors, New Delhi.
7. Chudley R. (1998). *Construction technology*. ELBS England.
8. Ambrose James. (1987). *Building construction*. Van Nostrand Reinhold, New York
9. Rangwala S C. (1998). *Engineering materials*. Charotar Publishing House, Anand
10. Deplazes, Andrea. (2008). *Constructing Architecture: Materials*. Processes, Structures, Birkhäuser Basel.
11. Stephen Kieran, James Timberlake. (2004). *Refabricating architecture: how manufacturing methodologies are poised to transform building construction*. McGraw-Hill Professional.

**3] ARC 206 : SURVEYING AND LEVELING : [1 0 3 2]****Course objective:**

To understand the principles of surveying, classification, types of surveys and their applications.

**Course contents:**

Introduction to chain survey, principles, classification, instruments used, ranging, reciprocal ranging, chaining on sloping ground, errors in chaining, tape corrections, obstacles to chaining and ranging, problems in chaining, cross staff survey, chain triangulation; Plane table survey, advantages and disadvantages, types of plane table survey, radiation, intersection, traversing and resection, errors in plane table survey; Levelling, methods of levelling, booking and reduction of levels, longitudinal levelling, cross sectioning, errors in levelling, problems in levelling, contouring; Theodolite survey, measurement of horizontal and vertical angles, problems tackled like centre line of building, setting out angles, etc.; Study of instruments, Total Station.

**References:**

1. Arora, K.R. (1991). *Surveying Vol.I*. Standard Book, New Delhi.
2. De, Alak. (2002). *Plane Surveying*. S. Chand and Company, New Delhi
3. Kanetkar, T. P, Kulkarni, S. V. (1989). *Surveying and Levelling*. vol.I, Vidyarthi Griha Prakashan, Pune.
4. Punmia, B.C. (2005). *Surveying*. Laxmi Publications Private Limited, Bangalore
5. Venakataramaiah, C. (1996). *Text Book of Surveying*. University Press, Hyderabad
6. Chandra A M.(2007). *Plane Surveying*. New Age International, New Delhi

**4] ARC 208 : HISTORY OF ARCHITECTURE - IV : [1 0 2 2]****Course objectives:**

To understand the various factors which triggered the architectural advancement of a civilization, country or region and to study buildings and its elements, cities and its civic places, concept and theories covering various aspects of a civilization.

**Course contents:**

Detailed study and analysis of architectural building examples under the light of

- a) Genesis of seed idea
- b) Climatic and geographic influence
- c) Socio-political background, key people involved
- d) Construction technology and material
- e) Physical organization, typology
- f) Spatial understanding and
- g) Detailing

**History of Architecture in South/ Peninsular India.**

Experiments at Aihole and Badami; Examples from Pattadakal- Virupaksha temple and Papanatha temple; Evolution of Dravidian temple; Study of styles, construction methods and planning under various dynasties in the South like the Chalukyas, Pallavas, Cholas, Pandyas, Hoysalas, Vijayanagar and Madurai with relevant examples; Study and analysis of development at Hampi; Traditional architecture of Kerala and South Kanara with detailed analysis with respect to aforementioned aspects.

**References:**

1. Brown, Percy. (1976). *Indian Architecture (Buddhist and Hindu period)*, 7<sup>th</sup> reprint. Taraporevala Sons & Co. Pvt. Ltd. Mumbai.
2. Fergusson, James. (1997). *History of Indian and Eastern Architecture, revised and edited with additions, Indian architecture by James Burgess and Eastern architecture by R. Phene Spiers, reprint, vol. I and vol. II*. Low Price Publications, Delhi.
3. Fisher, Robert E. (1993). *Buddhist Art and Architecture*. Thames and Hudson Ltd, London.
4. Grover, Satish. (2003). *Buddhist and Hindu Architecture in India*, 2<sup>nd</sup> edition. CBS publishers and distributors, New Delhi.

5. Deva, Krishna. (1995). *Temples of India, vol. I and II*. Aryan books international, Delhi.
6. Marian Moffett, Lawrence Wodehouse and Michael Fazio. (2004). *A World History of Architecture*. McGraw-Hill Professional.
7. Roth, Leland. (2006). *Understanding Architecture: Its Elements, History, and Meaning*. Westview Press.

## **5] ARC 210 : STRUCTURES - IV : [2 1 0 3]**

### **Course objective:**

Study, design and detailing of concrete and RCC structures, and their elements.

### **Course contents:**

Concrete as viable material for building construction, History of concrete making; Components and stages of concreting of works; Introduction to RCC; Analysis and design of slabs, beams, column using working stress method.

### **References:**

1. Vazirani & Ratwani. (1998). *Concrete Structures*. Khanna Publishers, New Delhi.
2. *Indian Standard Code: IS 456. (2000)*. Bureau of Indian Standards, New Delhi
3. Punmia B C & others. (2003). *Reinforced concrete structure*. Laxmi Publications, Bangalore
4. A.M.Neville and J.J.Brooks. (2003). *Concrete Technology*. Pearson Education, Delhi
5. Raju N Krishna. (2003). *Design of reinforced concrete structures*. CBS Publishers, Delhi
6. Gupta Ashok Kumar. (1999). *Design of reinforced concrete structures*. Galgotia, Delhi
7. Shah M G , Kale C M. (1972). *R C C theory and design*. Charotar Publicity House, Anand, India.

## **6] ARC 212 : BUILDING SERVICES - II : [1 0 2 2]**

### **Course objective:**

To understand the working of electrical, illumination and mechanical transportation services in buildings and their integration in design.

### **Course contents:**

#### **Electrical Services:**

Sources of electrical energy supplied to buildings, scope and requirements; Requirements of electrical materials such as conductors, insulators, types and requirements of electrical cables, control equipments such - switch gear, safety devices; Rules and regulations for electrification of buildings with relevant standards; Types of electrical wiring system, earthing; Communication and IT services, installations and cabling.

#### **Illumination:**

Concepts and considerations for artificial lighting; Different types of indoor and outdoor lighting.

#### **Mechanical Transportation Systems:**

Concept of mechanized transportation systems; Study of and design considerations for lifts, escalators and travelators.

### **References:**

1. Stein/Raynolds and Mc Guinness. (1966). *Mechanical and Electrical Equipment for Buildings, Vol.1*. John Wiley and Sons, NY.
2. Egan, David M. (1983). *Concepts in Architectural Lighting*. McGraw Hill Book Company.

3. Dagostino, F. R. (1978). *Mechanical and Electrical Systems in Construction in Architecture*. Reston Publishing Company, Prentice Hill Co., Virginia.

## **7] ARC 214 : CLIMATOLOGY : [2 1 0 3]**

### **Course objectives:**

To study climate on global, regional and local levels and relating climate to design and human thermal comfort, including day lighting studies to understand the lighting of Indoor spaces.

### **Course contents:**

Study of climate on a global scale - origins of climate; Influence of various factors at regional and local scales – micro climate; Study of parameters that influence human thermal comfort, comfort scales; Understanding the thermal environment and design as a means of furthering thermal comfort; Passive and low energy approaches to the achievement of thermal comfort; The visual environment – study of day lighting as a means of providing light within built spaces; Day light prediction tools; “Green” Architecture – its elements.

### **References:**

1. Brown, G. Z. (1985). *Sun, Wind and Light: Architectural Design Strategies*. John Wiley & Sons, New York.
2. Evans, Martin. (1980). *Housing, climate and comfort*. Architectural Press, London.
3. Koenigsberger, et. al. (1975). *Manual of Tropical Housing and Building (Part-II)*. Climate Design, Orient Longman Ltd, Hyderabad.
4. Mani, A. (1980). *Handbook of Solar Radiation Data for India*. Allied Publishers, New Delhi.
5. Olgyay, A. and Olgyay, V. (1957). *Solar Control and Shading Devices*. Princeton University Press, New Jersey.
6. Robbins, C. L. (1986). *Daylighting: Design and Analysis*. Van Nostrand Reinhold Co.

## **8] ARC 216 : LANDSCAPE ARCHITECTURE : [2 0 0 2]**

### **Course objectives:**

To understand the importance of nature for human beings, as well as sustainability in architecture; To learn about landscape development as an integral part of any built environment.

### **Course contents:**

Importance of nature for human beings, need and scope of landscape architecture, importance of landscape in developing sustainability in architecture; Development of gardens through history, in different parts of the world; Elements of landscapes – Land, Plants, Water, Climate. Services in landscapes, Garden structures, natural and man-made/processed elements; Concepts and development of modern gardens (Industrial era onwards); Site planning (based on features of landscape architecture) – study of site features, site analysis, design guidelines, site structure plans; Road geometrics.

### **Reference books:**

1. Birlested, Jan. (1998). *Relating Architecture to Landscape*. E and F N Spon, London.
2. Booth, Norman K. and Hiss, James E. (1991). *Residential Landscape Architecture*. Prentice Hall, New Jersey.
3. Cerver, F A .(1997). *International landscape architecture*. F A Cerver, Spain.
4. Laurie, M. (1986). *Introduction to Landscape Architecture*. Elsevier, New York.
5. Lynch, Kevin and Hack, Gary. (1988). *Site planning*. MIT Press, Cambridge.
6. Simonds, J. O. (1983). *Landscape Architecture: A manual of site planning and design*. McGraw Hill, New York.

7. John Fleming, Hugh Honour. (2004). *The Penguin Dictionary of Architecture and Landscape Architecture*. Penguin; 5th Revised edition edition.
8. Simonds, John.(1978). *Earthscape a Manual of Environmental*. McGraw-Hill Customer Service.

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#### **FIFTH SEMESTER**

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#### **1] ARC 301 : ARCHITECTURAL DESIGN - V : [10 0 0 10]**

##### **Course objectives:**

- To introduce the students the design of multi-functional/ multi-storeyed spaces with complex features incorporating built and unbuilt spaces.
- To deal with the site having design and development regulations.
- To design the service core in detail.
- To provide an opportunity to analyze, understand the project brief, site and the cultural context of the design problems..

##### **Course contents:**

**MAJOR PROJECT** – Apartments/Hospitals/Shopping Malls, etc.

**DOCUMENTATION:** Documentation Camp – Documentation camp consists of preparation of measured drawings of selected buildings / historic places inside and around the state.

##### **References:**

1. *BIS (2005) The National Building Code of India, SP:7*. Bureau of Indian Standards, New Delhi.
2. *BIS (1987) Recommendations for Buildings and facilities for the Physically Handicapped*. Bureau of Indian Standards.
3. Chiara, J. D. (1984). *Time Savers Standards for Site Planning*. McGraw Hill Book company, New York.
4. Chiara, J. D. and Calender. (1983). *Time Savers Standards for Building Types*. McGraw Hill Book Company, New York.
5. Neufert, Ernst. (1970). *Architect's Data*. Crosby Lockwood and Sons, London.

#### **2] ARC 303 : BUILDING CONSTRUCTION AND MATERIALS – V : [2 0 2 3]**

##### **Course objectives:**

To understand the functioning of special doors and windows and to develop an understanding of design and detailing issues of application of steel in building construction.

**Course Contents:****Construction Detailing:**

Steel trusses - Steel angle and tubular trusses for various spans - fabrication and erection details, roofing with GI sheets; Steel casement windows, Aluminum windows, PVC doors; Specialized structural systems like Geodesics, Space Frames and Layered Grids.

Vertical transport system like lifts, escalators. Services detailing such as water supply and plumbing.

**Building Materials study:**

Materials and methods for fire proofing; Thermal insulation, sound insulation; Damp proofing of basements and water retaining structure.

**References:**

1. Balagopal T.S.Prabhu. *Building Design and Civil Engineering Drawing*. Spades Publishers, Calicut.
2. R.Chudley. *Construction Technology, Vol.3, 4, 5*. ELBS, Longman group.
3. McKay, W.B. (1972). *Building Construction (Metric)*. Longman, London.
4. Foster, Stroud. (1963). *Mitchell's Advanced Building Construction*. Allied Publishers Pvt.Ltd., Bombay.
5. Gyala, Sabestyen. (1977). *Light Weight Building Construction*. George Godwin Limited, London.

**3] ARC 305 : BUILDING CODES AND BYELAWS : [1 0 2 2]****Course objectives:**

To provide an introduction to the codes and bye-laws applicable to building projects; to get a legal perspective of the design and building processes; to solve typical problems arising out of different situations in design and building processes.

**Course contents:**

Introduction to building codes and norms, Need and nature of building codes, standards and regulations, overview of basic terminologies, nature of building codes in special regions like heritage zones, air funnels, environmentally sensitive zones, disaster prone regions, coastal zones, hilly areas, etc.; Study of building regulations, Overview of administrative processes for obtaining building permits at various stages; General Land-use, building classifications and permissible uses; Norms for exterior and interior open spaces, Setbacks and margins, height, norms for building projections in open spaces, considerations in FAR, guidelines for open green areas; Norms for Vehicular Areas, Means of access, norms for access widths for various types of buildings, requirements of parking spaces, standards for turning radius, access to service areas; Requirements for parts of buildings - Plinth, Habitable rooms, kitchen, wet areas, mezzanine, store rooms, elevated parts like chimneys, parapets etc; Norms for Fire Protection, Overview of fire protection norms for various building classifications, norms for fire-exit ways and building materials, concept of fire zoning, doorways, stairways, passages and corridors, fire escapes etc; Norms for building services, Norms for lighting and ventilation, introduction to basic terminologies, components of daylight factor, general principles of opening for good lighting, considerations in artificial lighting; general principles for natural and mechanical ventilation, overview of norms for acoustical and electrical installations.

**References:**

1. Durga Prasad, M.V. (1997). *Law of Flats, Apartments and Buildings, 4th ed.* Asia Law House, Hyderabad.
2. *BIS (1989) National Building Code of India. (1983).* Bureau of Indian Standards, New Delhi.
3. *Urban Development Plan Formulation and Implementation. (1996).* New Delhi.
4. Thomas, Marvin. (1978). *Architectural Working Drawings: A Professional Technique.* McGraw Hill Book Co., N.Y.
5. Watila, Osamu A. & Linde, Richard M. (1994). *Professional Practice of Architectural Working Drawing.* John Wiley, NY.
6. Prabhu, Balagopal T. S. (2004). *Building Design and Civil Engineering Drawing.* Spades Publishers, Calicut.

**4] ARC 307 : HISTORY OF ARCHITECTURE - V : [1 0 2 2]****Course objectives:**

To understand the various factors which triggered the architectural advancement of a civilization, country or region and to study buildings and its elements, cities and its civic places, concept and theories covering various aspects of a civilization.

**Course contents:**

Detailed study and analysis of architectural building examples under the light of

- a) Genesis of seed idea
- b) Climatic and geographic influence
- c) Socio-political background, key people involved
- d) Construction technology and material
- e) Physical organization, typology
- f) Spatial understanding and
- g) Detailing

**History of Architecture in the Islamic and Colonial periods of India.**

An overview of world Islamic architecture from 600 AD to 1000 AD; An overview of Islamic architecture in India from 1000 AD to the end of Mughal period; The rise of imperial style in Delhi and architectural development under various dynasties: – Slave, Khilji, Tughlaq, Sayyid & Lodi dynasties; Provincial style with respect to architectural character and its influences in Deccan, Bengal, Gujarat and Jaunpur; The rise of historic development of Mughal architecture in Delhi and tracing the evolution of style under various rulers. Study of various building types, building elements and methods of construction; Mughal architecture as a fusion of Indian skills and Mughal influences, reaching zenith in geometry and planning; Development of Colonial architecture in India – Dutch, Portuguese, French and British architectural influences in India; Overview of Indo-Saracenic style of Architecture, merging of local architecture with British styles. Impact of Indo-Saracenic architecture on the architectural development of Pre-independence India; The colonial influence as an impression of renaissance in Europe and later a fusion of Indian regional and European styles.

**References:**

1. Asher, Catherine B. (1992). *The New Cambridge History Of India, I: 4, Architecture of Mughal India.* Cambridge University Press.
2. Brown, Percy. (1976). *Indian Architecture (Islamic period), 7<sup>th</sup> reprint.* Taraporevala Sons & Co. Pvt. Ltd. Mumbai.
3. Fergusson, James. (1997). *History of Indian and Eastern Architecture, revised and edited with additions, Indian architecture by James Burgess and Eastern architecture by R. Phene Spiers, reprint, vol. I and vol. II.* Low Price Publications, Delhi.
4. Fletcher, Sir Banister. (1996). *A History of Architecture, Dan Cruickshank (ed.) 20<sup>th</sup> edition.* CBS Publishers & Distributors, New Delhi.

5. Goodwin, Godfrey. (1971). *A history of Ottoman architecture*. London, Thames and Hudson.
6. Grover, Satish. (2003). *Islamic Architecture in India, 2<sup>nd</sup> edition*. CBS publishers and distributors, New Delhi.

## **5] ARC 309 : STRUCTURES - V : [2 1 0 3]**

### **Course objective:**

Study of steel structures, design of steel structural members and connection details.

### **Course contents:**

Design of steel columns and beams by IS code method, built up columns; Steel trusses, Design of compression and tension members in trusses; Analysis and design of structural connections, riveted and welded connections; Composite structures.

### **References:**

1. Ramamrutham S , Narayan R. (2008). *Theory of structures*. Dhanpat Rai Publishing Company Pvt.Ltd., New Delhi.
2. Chandra Ram.(2003). *Design of Steel structures*. Standard Book House, Delhi.
3. IS 800 (2007). *IS code for steel design*. Bureau of Indian Standards, New Delhi
4. Vazirani V N, Ratwani M M. (2003). *Design and analysis of steel structures and timber structures*. Khanna Publishers, Delhi
5. Duggal S K. (2005). *Design of steel structure*. TMH, New Delhi
6. Negi L S. (2003). *Design of steel structure*. TMH, New Delhi
7. Arya A S, & Ajimani J L. (1996). *Design of steel structure*, Nem chand, Roorkee

## **6] ARC 311 : BUILDING SERVICES - III : [2 0 2 3]**

### **Course objective:**

To understand the working of mechanical climate control systems and acoustics in buildings and their integration in design.

### **Course contents:**

#### **Acoustics:**

Introduction to the study of Acoustics, Noise and its types; Outdoor and indoor noise, Study of behavior of sound in an enclosed space; Absorption of sound, sound absorption co-efficient; Reverberation time; Constructional measures of noise and sound insulation, various sound absorbing materials; Acoustical design for halls used for drama, music, speech, cinemas and open air theatres.

#### **HVAC:**

Concepts of mechanical heating, ventilation and Air-conditioning; Definition and classification; Design considerations, overview of types and working of HVAC systems; Refrigeration cycles – thermal properties of built elements, evaluation of heat flow; Principles and guidelines for AC ducting – provisions for fire safety; Energy Conservation techniques.

**References:**

1. Egan, David. (1988). *Architectural Acoustics*. McGraw Hill Book Co., NY.
2. Kinsleter, Lawrence E. and Frey Austin R. (1989). *Fundamentals of Acoustics (ed.2)*. Wiley Eastern Ltd., New Delhi.
3. Templeton and Saunders. (1987). *Acoustic Design*. Architectural Press, London.
4. Blue Star. (1996). *The Blue Star Guide to Comfort Air Conditioning, Blue Star Packaged Air Conditioner Division*.
5. Flynn, J.E. et. Al.(1992). *Architectural Interior Systems: Lighting, Acoustics and Air conditioning*. Van Nostrand Reinhold Co.
6. Jones, W.P. (1985). *Air Conditioning Engineering*. ELBS (Edward Arnold).

**7] ARC 313 : PASSIVE ENVIRONMENTAL ARCHITECTURE : [1 0 2 2]****Course objectives:**

To explore the issues of passive environmental architecture in terms of design systems, materials, energy and climate.

**Course contents:**

Building design in response to various climates and its impact upon requirements of materials, technologies and energy in building; Energy and other resource use by the construction industry; it's implications for the natural environment; Concept of embodied energy; Energy use in buildings: passive and active energy systems; Passive cooling: Passive and low energy approaches; The need for bioclimatic and low-energy design; principles of solar passive architecture; integrated passive design – the integration of lighting, cooling and ventilation strategies for buildings in the tropics; Environmental laws and various ratings for built environment.

**References:**

1. Bansal, N. K. & Minke, G. (eds). (1995). *Climatic Zones and Rural Housing in India*. Forschungszentrum Julich, Julich (Germany).
2. Oliver, Paul (ed). (1997). *Encyclopedia of Vernacular Architecture of the World, vol. 1-11*. Cambridge University Press, Cambridge.
3. Buchanan, P. (2005). *Ten shades of green: architecture and the natural world*, The Architectural League of New York.
4. Givoni, B. (1994). *Passive and low-energy cooling of buildings*. Van Nostrand Reinhold.
5. Guzowski, M. (2000). *Daylighting for sustainable design*. McGraw Hill (Professional Architecture Series).
6. Hyde, R. (2000). *Climate responsive design: a study of buildings in moderate and hot humid climates*. E & F N Spon, London.
7. Majumdar, M. (Ed.) (2002). *Energy efficient buildings in India*. MNES/TERI.
8. Sayigh, A A M. (1991). *Energy conservation in buildings*. Pergamon Press, Oxford.
9. Shaw, Alexander. (1989). *Energy design for architects*. Fairmont Press, Lilburn.
10. Nayak J. K. et.al. (1999). *Manual on Solar Passive Architecture*. Solar Energy Center, Ministry of Non-Conventional Energy Sources, Government of India, New Delhi.

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## SIXTH SEMESTER

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### 1] ARC 302 : ARCHITECTURAL DESIGN - VI : [10 0 0 10]

#### Course objectives:

- The site development/detailed lay-out planning of large-scale projects
- To introduce **large-scale layout schemes** with respect to campus planning principles.
- Projects shall have emphasis on technology & application of various building services.
- To explore socio-cultural and economic issues connected with architecture.
- To incorporate '**working drawing**' with the respective project.

#### Course contents:

**MAJOR PROJECT:** Projects may be on Housing, commercial, public, semi- public, Institutional building projects involving large scale lay-out schemes, etc.

**MINOR PROJECT:** Design of related areas of major project.

#### References:

1. *BIS (2005) The National Building Code of India, SP:7.* Bureau of Indian Standards, New Delhi.
2. *BIS (1987) Recommendations for Buildings and facilities for the Physically Handicapped.* Bureau of Indian Standards.
3. Chiara, J. D. (1984). *Time Savers Standards for Site Planning.* McGraw Hill Book company, New York.
4. Chiara, J. D. and Calender. (1983). *Time Savers Standards for Building Types.* McGraw Hill Book Company, New York.
5. Ching, Francis D. K. (1979). *Architecture Form, Space and Order.* Van Nostrand Reinhold Company, New York.
6. Neufert, Ernst. (1970). *Architect's Data.* Crosby Lockwood and Sons, London.

### 2] ARC 304 : BUILDING CONSTRUCTION AND MATERIALS – VI : [2 0 2 3]

#### Course objectives:

To impart knowledge about specialized structures and structures using non-conventional materials and technologies and to develop comprehension of design, fabrication, erection/ construction detailing issues of Façade Systems, Wall Claddings, Shell and Folded Plate constructions.

#### Course Contents:

##### Construction Detailing:

Façade systems - Curtain walls, classification, assemblies, structural glazing system; Wall claddings with stone veneers, cement concrete panels, brick/tile cladding systems construction details; Specialized structural systems like Shells and Folded Plates; Ferro-cement and its applications; Appropriate building construction for low cost construction.

##### Building Materials study:

Use of glass in buildings; Pre-fabricated building systems.

**References:**

1. R.Chudley. *Construction Technology* ,Vol.4.
2. Mckay WB. *Building Construction*.
3. *Handbook on Concrete Reinforcement and Detailing*, BIS.
4. Barry, R. (1999). *Construction of Buildings*.
5. [www.portafab.com](http://www.portafab.com);[www.wbdg.org](http://www.wbdg.org);[www.earth-auroville.com](http://www.earth-auroville.com)

**3) ARC 306 : WORKING DRAWING [4-0-0-4]****Course objectives:**

The objective of this course is to develop the skills and techniques of preparation of production drawings by taking an already self designed project of earlier semester and imparting training of the drafting of working drawing details.

**Course contents:**

Exposure to the production drawing techniques used in the office environment; The preparation of drawings with standard practiced notations, symbols to convey the architectural design and details for the execution purpose; The preparation of drawings for load bearing structures and also to the framed structures separately right from the excavation drawing, foundation details, wall marking details, structural drawing details, roof details, door and window opening schedule and details; The preparation of checklists for drawing numbers, cross verification of drawing, extracting the quantities for estimates; The portfolio should contain all detailed execution drawing of the project completely.

**References:**

1. Waktia, Osamu and Linde, Richard. (1977). *The Professional Practice of Architectural Detailing*. John Wiley and Sons, N.Y.
2. Thomas, Marvin. (1978). *Architectural Working Drawings: A Professional Technique*. McGraw Hill Book Co., N.Y.
3. Watila, A & Richard M.Linde. *The Professional Practice of Architectural Working Drawings by Osamu*. ISBN-10:0471395404, ISBN-13:978-0471395409.

**4] ARC 308 : HISTORY OF ARCHITECTURE VI : [1 0 2 2]****Course objectives:**

To provide an understanding of architecture from Industrial Revolution to the Modern movement and to study Movements, Schools, Styles, and Influences and to provide an understanding of development of various theories of architecture in the various time frames and styles in more recent past, of both India and the world.

**Course contents:**

Detailed study and analysis of architectural building examples under the light of

- a) Genesis of seed idea
- b) Climatic and geographic influence
- c) Socio-political background, key people involved
- d) Construction technology and material
- e) Physical organization, typology
- f) Spatial understanding and
- g) Detailing

### **Architecture after the Industrial Revolution.**

General characteristics of Rococo and Néo-classique architecture ; Search for style, Revivalism and éclecticisme ; Transitional Period – A brief account of the situation before the changeover to Modern architecture in Europe; Impact of Industrial Revolution in Europe; Development of skyscraper; Development of architectural theories; The Modern Architecture Movement; Seminal works of modern architecture, Ideas and works of Great Masters.

Overview of Post-independence Architecture in India; Development of a new state and the effects on architecture. Impact of the works of various foreign architects in India; Architectural language of the first generation Indian architects during the period; Post and late modern architecture; Rise and development of the Post Modern Architecture theory; Introduction to the ideas and works of contemporary masters; New Theories of Architecture during the era - Hi Tech Architecture, Minimalism, Structuralism, Deconstructivism, Metabolism, New Expressionism, Novelty Architecture, Organic Architecture and Blobitecture; Continuation of the New Theories in the contemporary era; Modern Indian Architecture and philosophy of second generation Indian architects.

### **References:**

1. Avery, Derek. (2003). *Modern Architecture*. Chaucer Press, London.
2. Curtis, William J R. (2003). *Modern Architecture since 1990, 3<sup>rd</sup> edition*. Phaidon Press, London.
3. Evans, Mike ed. (1998). *Key Moments in Architecture*. Hamlyn, London.
4. Frampton, Kenneth. (1992). *Modern Architecture, a critical history, 3<sup>rd</sup> edn*. London.
5. Gossel, P. & Gabriele Leuthauser. (2001). *Architecture in the twentieth century*. Taschen, GmbH, Germany.
6. Trachtenberg, Marvin & Hyman, Isabelle. (1986). *Architecture from prehistory to post-modernism*. Academy editions, London.
7. Bhat, Vikram and Scriver, Peter. (1990). *After The Masters*. Mapin Publications, Ahmedabad.
8. Jencks, Charles. (1984). *The Language of Post Modern Architecture*. Academy Editions, London.
9. Krafft, Anthony. (1989). *Contemporary Architecture*. Bibliotheque Der Arts, France.
10. Lang, Jon and others. (1997). *Architecture and Independence*. Oxford University Press, New Delhi.
11. Venturi, Robert. (1977). *Complexity and contradiction in architecture*. Architectural Press Ltd. London.

## **5] ARC 310 : STRUCTURES - VI : [2 1 0 3]**

### **Course objective:**

To provide exposure to soil building relationships, seismic response of built form, elementary study of structures for large spans.

### **Course contents:**

Soil classification, soil properties; Elementary Seismology, Building response to earthquake vibrations, Seismic Design Principles, Structural Detailing; Foundation requirements, building foundations, classification; Design consideration for masonry and RCC foundations; Study of long span steel structures such as space frames, etc.

### **References:**

1. NICEE Publications.
2. Punmia B C. (2006). *Soil Mechanics and Foundations*. Laxmi Publications Pvt. Ltd., Bangalore
3. Murthy V N S. (2007). *Textbook of soil mechanics and foundation engineering*. CBS, New Delhi
4. Dr.N.Subramanian. *Principles of Space Structures*. Wheeler and Company Limited, Allahabad.
5. Chandra Ram. (2003). *Design of Steel structures*. Standard Book House, Delhi.
6. IS 800. (2007). *IS code for steel design*. Bureau of Indian Standards, New Delhi

7. Vazirani V N, Ratwani M M. (2003). *Design and analysis of steel structures and timber structures*. Khanna Publishers, Delhi
8. Duggal S K. (2005). *Design of steel structure*. TMH, New Delhi
9. Negi L S.(2003). *Design of steel structure*. TMH, New Delhi
10. Vazirani & Ratwani. (1998). *Concrete Structures*. Khanna Publishers, New Delhi.
11. *Indian Standard Code: IS 456 (2000)*. Bureau of Indian Standards, New Delhi
12. Punmia B C & others. (2003). *Reinforced concrete structure*. Laxmi Publications, Bangalore
13. Raju N Krishna. (2003). *Design of reinforced concrete structures*. CBS Publishers, Delhi
14. Dowrick David J. (2003). *Earthquake risk reduction*. John Wiley, NewYork
15. Architectural Institute of Japan.(1966). *Design essentials in earthquake resistant buildings*. Tokyo
16. IAEE. (1986). *Guidelines for earthquake resistant non engineered construction*. Japan

## 6] ARC 312 : SPECIFICATION AND ESTIMATION : [1 0 2 2]

### Course objectives:

The objective of this course is to understand the language and vocabulary of specification writing develop skills of specification writing for various building materials and building works and to impart training in taking out quantities of building elements, rate analysis and preparation of estimates.

### Course contents:

Definition, types, importance of outline and detailed specification in construction practice, method of writing specifications; Detailed specification writing for materials and works: Brick, stone, sand, lime, timber, cement, AC sheets, GI sheets, steel reinforcement, paints and varnishes, floor, glass, tiles, ceramic and terrazzo burnt clay tiles, materials for partition framing and cladding, plywood, hardboard, PVC flooring materials for false ceiling, poly-esterene (thermocole), pvc sheeting, metal foils, steel structures; Earth work in different soils, masonry work, flooring, roofing, concrete structures, water proofing works (basement, roofs), false ceiling, carpentry works, painting and finishing; Class work shall also include training to write specification for works designed for special situation like non conventional use of conventional materials, etc.

Need for quantity surveying, measurement of items of construction work; Taking out quantities of work items, long wall – short wall method, centre line method; Preparation of abstract of estimated quantities; Rate analysis of different work items, factors affecting rate of an item; Preparation of project estimate; types of estimates; Contract, types of contracts, tender, tender documents, earnest money.

### References:

1. CPWD (1987) *Schedule of Rates*. Government of India Publications, New Delhi.
2. Dutta, S. (1989). *Estimating and Costing (ed.20)*. S.Dutta and Co., Lucknow.
3. Rangawala, S.C. (1984). *Estimating and Costing*. Charotar Publishing Co.
4. *Relevant BIS Codes for Material Specifications*.

## 7] ARC 314 : HUMAN SETTLEMENTS : [1 0 2 2]

### Course objectives:

To give an overview of Human Settlement in the World and in India through various time frames and to familiarize the students of architecture with the basic principles and techniques of Town and Country Planning.

### Course contents:

Definitions of rural and urban settlements, characteristics and classification of urban settlements; Introduction to city types; Historic evolution of human settlements, characteristics of the city form and structure in history; Impact of Industrial Revolution on urbanization and city form and function  
Development of city planning norms in Europe and the Americas; Emergence of the contemporary city, Comparison of planning theories by various proponents; Urban Land Use and transportation Planning- city functions and zoning; The Contemporary city in India, post Independence urbanization; Challenges of urbanization, migration and population explosions, slums and squatters, infrastructure for the urban centers; Regulatory role of government in urban development - overview of salient policies and regulatory bodies - State Town and Country Planning Acts, National Housing Policy, UDPFI guidelines, Urban Arts Commission, Urban Renewal Mission and other relevant regulations.

### Reference books:

1. Keeble, Lewis. (1968). *Town and Country Planning*. Ms Havding Gough Ltd. UK.
2. Gallion, Arthur. (2003). *The Urban Pattern*. CBS Publishers & Distributors, India.
3. Cullen, Gordon. (1968). *Townscape*. Architectural Press, London.
4. Bandyopadhyay, Abir. (2001). *Text Book of Town Planning*. Books and Allied (P) Limited, India.
5. Hiraskar, G.K. (1997). *Fundamentals of Town Planning*. Dhanpat Rai Publications, India.
6. Ameen, Farooq. (1997). *Contemporary architecture and city form*. Marg Publishers.

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### SEVENTH SEMESTER

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## 1] ARC 401 : ARCHITECTURAL DESIGN - VII : [10 0 0 10]

### Course objectives:

- To explore planning, analysis and design in an urban or rural context.
- To study the urban context, and to prepare the solution/master plan, by intervening the critical areas.
- To introduce the system of **revivifying/renovating** the urban context.

### Course contents:

**MAJOR PROJECT:** Large scale projects involving Architectural Design solutions in Urban Areas. Development/redevelopment of markets, plazas, city square; transport and public areas, etc.

### DISSERTATION:

#### 1. Aim of the dissertation

To provide the students an opportunity to undertake research work on a topic of their choice.

#### 2. Allotment of Guide

The Director, MSAP will allot a guide to each student for supervising His/ Her dissertation work.

### 3. Area of research

Any topic approved by the Director of the institution concerned, related to Architecture/built environment.

### 4. Selection of the topic

Students admitted to the 6th semester B.Arch. Degree course shall submit the choices of their topic for dissertation in consultation with the guide within one month after registration to 6th semester, from which Director; MSAP will approve one topic for each student.

### **References:**

1. Alexander, Christopher. (1977). *Pattern Language*. Oxford University Press.
2. Ameen, Farooq. (1997). *Contemporary Architecture and City Form*. Marg Publishers.
3. Banargee Tridib Southworth Michael. (1990). *City Sense and City Design*. MIT Press.
4. Birlested, Jan .(1999). *Relating architecture to Landscape*. E and F N Spon, London.
5. Chiara, J. D. (1984). *Time Saver Standard for Site Planning*. McGraw Hill Book Co., New York.
6. Rapoport, Amos. (1969). *House, Form and Culture*. Prentice Hall.
7. Sanoff, Henry. (1991). *Visual Research Methods in Design*. Van Nostrand Reinhold.
8. Spiro, Kostof. (1992). *City Assembled, Thames and Hudson*.
9. Watson, Donald; et al. (2003). *Time Saver Standards for Urban Design*. McGraw Hill, New York.
10. Paul D. Sprengar. *Urban Design, the Architecture of Towns and Cities*. Mc GrawHill.
11. Gordon Cullen. *Townscape*.
12. Edurand Bacon. *Design of Cities*.

## **2] ARC 403 : INTERIOR DESIGN AND DETAILING : [2 0 2 3]**

### **Course objective:**

To expose students to designing and detailing of interior spaces including materials for construction, construction techniques, preparation of schematic and detail drawings, construction drawings, and costing.

### **Course Contents:**

Visualization of interior spaces with respect to light colour and functional aspects; Use of materials in specific conditions of restaurants, cinema, auditorium, planetarium, to condition light and acoustic level working details, collection of materials and market study and case study quality materials and workmanship.

### **References:**

1. Jain, Shashi. (1994). *Creative Interiors*. Management Publishing Company, New Delhi
2. Ching, Frnacies, D.K. (1987). *Interior Design Illustrated*. Van Nostrand Reinhold, New York
3. Korn, Ahmed A.. (1992). *Interior Design*. Iquara Publication Limited, Bombay
4. De Chiara, Joseph. (1992). *Time Savers Standard for Interior Design and Space Planning*. McGraw Hill Publishing Company.

## **6] ARC 405 : HOUSING: [2 0 1 3]**

### **Course objectives:**

Study deals with influences and demands for housing and specialises strongly on application orientations in the area of strategic housing development

### **Course contents:**

Introduction to housing in early settlements with emphasis on the evolution of settlement pattern

Nature and magnitude of the housing problem in India

Study of Urban and Rural housing;Urbanization and Poverty issues in the Indian context.

Role of Housing in the National level and the major housing programmes carried out in the various five year plans.

Important earlier Housing Schemes in India for various categories like HIG, MIG, LIG, EWS etc

Study of Slums and its impact on the urban housing scenario. Examples of the major Slum clearance and Slum Improvement scheme.

Concept of Aided Self Help- Housing the poor through the NGO's ,best practices in housing ,high rise housing schemes

National Housing Policy : need , objectives and role in housing

Housing Finance: Sources and characteristics. Major Housing Finance agencies at the National and State level like the NHB, HDFC, LICHL, GIC, UTI, Commercial Banks etc

#### **References books**

1. K. Thomas Poulouse- *Innovative Approaches to Housing for the poor*
2. Dr. Misra and Dr.B.S. Bhooshan- *HabitatAsia*
3. Dr. Misra and Dr.B.S. Bhooshan- *Habitat India*
4. Arthur Gallion- *Urban Pattern*
5. *Reading Material in Housing* -Compiled by K. Thomas Poulouse for ITPI students
6. *Five Year Plans- Government of India Publications*

### **7] ARC 407 : PRINCIPLES OF URBAN DESIGN : [2 0 1 3]**

#### **Course objectives:**

To initiate the students to the basic principles of urban design and to develop an ability to be sensitive to urban issues and give effective design ideas for situations involving public realm.

#### **Course contents:**

Definition of Urban Design; Necessity and benefits of quality urban design; Scope, levels and scales of urban design; Terminologies and various elements in urban design; Users and activities in a city and their analysis; Behavioral studies and user needs; People - centric design and public participation; Memory and mental mapping, perception and cognition, the five elements in a city; Attributes of successful towns and cities; Urban Morphology and Urban Character – anatomy of an urban area; Studies, surveys and analysis in urban design; Formulation of issues for intervention; Aspect of urban design as a multi-disciplinary field for effective implementation of concepts and designs; Nature / environment and urban design – open spaces, urban spaces and urban places; Pedestrianisation; Importance of site planning and designing in a context; Urban design in history, through a selection of iconic examples; Aspects of heritage and historical continuity.

#### **Reference books:**

1. Broadbent, Geoffrey (1990). *Emerging concepts in urban space design*. Van Nostrand Reinhold, London.
2. Christopher, Alexander. (1987). *New theory of urban design*. Oxford University Press.
3. Cullen, Gordon. (1968). *Townscape*. Architectural Press, London.
4. Gallion Arthur B and Eisner, Simon. (1963). *Urban Pattern : City Planning And Design*. Van Nostrand Reinhold, London.
5. Krier, Rob. (1984). *Urban Space*. Academy editions.
6. Lynch, Kevin. (2000). *Image of the city*. MIT Press, London.
7. Spreiregen, Paul D. (1965). *Urban Design: The Architecture of Towns and Cities*. McGraw Hill.

## 4] ARC 409 : STRUCTURES - VII : [2 1 0 3]

### Course objectives:

To understand design of reinforced concrete design by limit state method and to investigate pre-stressed and post-tensioned concrete structures.

### Course contents:

Introduction to limit state method of design of RCC Structures; Design of various building components such as beams, slabs, columns, etc.; Use of SP 16 and SP 34; Concept of pre-stressed concrete, pre-tensioning, post-tensioning; Analysis and design of pre-stressed concrete members.

### References:

1. Lin T Y & Burns N H. (1982) *Design of prestressed concrete structures*. MGH, Singapore
2. Ashok Kumar Gupta. (1999). *Design of Reinforced Concrete Structures*. Galgotia, Delhi
3. N.Krishna Raju. (2002). *Prestressed Concrete*. Tata McGraw Hill, New Delhi
4. Vazirani & Ratwani. (1998). *Concrete Structures*. Khanna Publishers, New Delhi.
5. *Indian Standard Code: IS 456 (2000)*. Bureau of Indian Standards, New Delhi
6. Punmia B C & others. (2003). *Reinforced concrete structure*. Laxmi Publications, Bangalore
7. Raju N Krishna. (2003). *Design of reinforced concrete structures*. CBS Publishers, Delhi
8. Gupta Ashok Kumar. (1999). *Design of reinforced concrete structures*. Galgotia, Delhi
9. Dayaratnam P. (1996). *Prestressed concrete structures*. Oxford and IBH, Delhi

## 6] ARC 411 : RESEARCH TECHNIQUES : [2 0 2 3]

### Course objectives:

To streamline the pursuit of research in the architectural design development.

### Course contents:

Introduction to research - types of research- elements of research – research methodology; Characteristic of good research - selection of appropriate research design – planning the research - elements of research - research in architectural design development; Types of research survey- conducting architectural survey - Interviews in research – case studies - observation in the research – role of physical traces - applied researches in architectural design - Data collection and data analysis; Introduction to Statistical analysis and graphical representation; Introduction to report and research paper writing; different styles of report writing - APA and MLA style of report writing; Developing a thesis design / research statement, leading to creation of comprehensive base of information relevant to the thesis; Preparation of a dissertation for the thesis in the following semester.

### References:

1. Dwivedi, R.S. (2001). *Research Methods in Behavioral Science*. Mcmillan, New Delhi.
  2. Graziano, Anthon. (1989). *Research Methods Process of Inquiry*. Harper Collins Publishing New York.
  3. Groat, Linda and Wang, David. (2002). *Architectural Research Methods*. John Wiley publication, New York.
  4. Harrigan, J E. (1987). *Human Factors Research Methods*. Elsevier, Amsterdam.
  5. Kothari, C R. (1990). *Research Methodology: Methods & Techniques, 2<sup>nd</sup> edn*. Wishwa Prakashan, New Delhi.
  6. Sanhoff, Henry. (1991). *Visual Research Methods in Design*. Van Nostrand Reinhold, New York.
  7. Zeisel, John. (1995). *Inquiry by Design: Tools for Environment-Behaviour Research*. Cambridge University press, Cambridge.
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## **EIGHTH SEMESTER**

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### **1] ARC 402 : THESIS : [18 0 0 18]**

#### **Course objectives:**

The objective of this course is to develop independent critical thinking and design/research abilities under the guidance of the faculty adviser, in demonstrating at the minimum the architectural knowledge gained over the last five years, skills developed and professionalism inculcated.

#### **Course contents:**

The thesis project is to prove the ability of student to handle all phases of a building/research design. It is a subject for scholastic study through analysis. It is the development and presentation to design of a building including its setting in specific environment and its typical aspects. The scope of this thesis can be in the areas such as architectural design, urban design, architectural research. Area of the study is left to the choice of the student. As per his inclination towards the area, the final selection of the topic will be as approved by the thesis selection committee of the Faculty of Architecture. The progressive evaluation of student's work is mandatory. The student shall commence the work on the topic after the approval. The evaluation is conducted by a panel of jury intermittently & a final open defense is conducted.

#### **References:**

1. *Thesis Manual containing all rules and regulations pertaining to the conduct of thesis and which will be given to the students at the start of the semester.*
2. *References for thesis will be topic specific, encompassing the various issues to be studied.*

### **2] ARC 404 : PROFESSIONAL PRACTICE : [2 1 0 3]**

#### **Course objectives:**

To critically look into the project and office management practice emphasizing on professional services and professional ethics as well as project responsibilities during design and construction.

#### **Course contents:**

Understanding the basic concepts and terminology in architectural practice; The differences between architectural profession and other professional disciplines; A clear knowledge of code of conducts and ethics in profession; The knowledge of apex monitoring body to protect the interest of the profession; Role of an architect in conceptualizing, design proposal until the execution procedures; The relationship between the architect and other executive agencies; The legal dimension of professional practice, architect's role as an arbitrator; A comprehensive understanding of office set up, office administration, selection procedure for various posts, man power management within the office and resource leveling; Laws and regulations that effect architecture as well as building.

#### **References:**

1. Namavati, Roshan. (1993). *Professional Practice*. Laxmi Book Depot, Mumbai.
2. The Indian Institute of Architect. (1988). *Handbook of Professional Practice*. Architects Publishing Corporation, Mumbai.
3. Council of Architecture. (1996). *Directory of Architects and Architectural Firm*. Council of Architecture, New Delhi.
4. Wills, Arthur. (1974). *The Architect in Practice*. Crosby Lockwood Staples, London.

### **3]ARC 406 : ELECTIVE – I : [1 0 2 2]**

#### **ARC 406.1 : TALL BUILDINGS**

**Course objective:**

To understand the design and construction process of tall buildings.

**Course contents:**

Definition – International & Indian concepts, history of tall buildings; Need and criteria for development of tall buildings, economics, geographical, political & other forces in development; Socio-psychological factors effecting such development; Analysis, studies & methodology to solution – users' need and demand; Design and construction process; Impact of tall buildings on urban development in terms of increased density, accessibility, transportation and parking; Ownership, management, and maintenance; Fire safety, municipal codes, standardization; Landscaping in tall buildings.

**References:**

1. Beedle, Lynn S. (1986). *Advances in Tall Buildings*. Van Nostrand Reinhold, NY.
2. C T B U H. (1981). *Planning and Environmental Criteria for Tall Buildings*. American Society of Civil Engineers, New York.
3. Gupta, YK (ed). *High Rise Structures- Design and construction Practices for Middle level cities*.
4. Kowalezyk, Ryszard M. (1995). *Structural systems for tall buildings*. Mc Graw Hill, New York.
5. *Monograph on Planning and Design of Tall Buildings (Council on Tall Buildings and Urban Habitat)*.
6. *Proceedings of the International conference on Planning and Design of Tall buildings Vol.1a-Systems and Concepts*.

**ARC 406.2 : PROJECT MANAGEMENT & VALUATION****Course objective:**

The objective of this course is to create awareness of project management principles and various methods of valuation as applied to construction industry & relevance to architectural profession.

**Course contents:**

Introduction to construction management, applied management techniques in construction projects; Application of project management tools like CPM and PERT networks to building projects; Concept of project management, relevance of project management to building industry; Project management team model; Role of Architect in the project management; Introduction to networking of projects and use of CPM and PERT networking and scheduling tools; Project monitoring – updating of networks, advantages and limitations of Bar and Milestone charts; Resource leveling.

Theories and principles of valuation of immovable properties, differences & similarities of cost, price and value. Value subjected to purpose, date and title of property, different forms of value. Valuing by depreciation of cost, straight line method, constant percentage method, sinking fund method, sum of digit method. Local bodies and government taxes, annual repairs and maintenance insurance, loss of rent. Valuation of leasehold, free hold properties, licenses premises, legal limits and advantages.

**References:**

1. Chitkara, K. K. (1999). *Construction Project Management: Planning, Scheduling and Controlling*. Tata McGraw-Hill Pub., New Delhi.
2. Gould, E., Frederick and Joyce, E. Nancy. (2000). *Construction Project Management*. Prentice Hall, New Jersey.
3. Gupta, B.L. and Gupta, Amit. (2005). *Construction Management, Machinery and Accounts, 3rd ed*. Standard Pub.
4. Loraine, R.K. (1993). *Construction Management in Developing countries*. Thomas Telford, London.

5. NICMAR (1990). *Construction Machines & Equipment*. National Institute of Construction Management and Research.
6. Peurifoy, R. I. (2007). *Construction Planning Equipment and Methods*, McGraw Hill.
7. Sharma, S.C. (2004). *Construction Equipment and its Management*, 4<sup>th</sup> edn. Khanna Pub., New Delhi.
8. Namavathi Roshan. (1993). *Professional Practice*. Lakshmi Book Depot
9. Ashwath Damodaran. (2002). *Investment Valuation: Tools & Techniques for determining the value of any asset*

### **ARC 406.3 : ENERGY CONSCIOUS DESIGN**

#### **Course objectives:**

To review energy efficient building technologies, understand scope of their applications and design an energy efficient building, and to integrate passive controls in building design for climatic zones.

#### **Course contents:**

Energy and other resource use by the construction industry; it's implications for the natural environment; Concept of embodied energy and the need to use local materials in construction, comparison of embodied energy in different building materials; Fundamental understanding and practical applications of energy efficient building design strategies; Building design in response to various climates and its impact upon requirements of energy in building; Energy use in buildings: passive and active energy systems; The need for bioclimatic and low-energy design; principles of solar passive architecture; integrated passive design – the integration of lighting, cooling and ventilation strategies for buildings in the tropics; Passive cooling: Passive and low energy approaches to the achievement of thermal comfort; Passive methods of Cooling, roof pond, desiccant cooling, evaporative Cooling, and earth sheltered buildings etc.; Use of alternate and renewable, non- conventional energy sources and their integration/use in building system; Green architecture; Building energy management system and energy audit of buildings using computer software; Low energy strategies and guidelines.

#### **References:**

1. ASHRAE. (1997). *ASHRAE Fundamentals Handbook (SI)*, American Society of Heating, Refrigerating and Air-Conditioning Engineers. New York.
2. Boutet, T. S. (1987). *Controlling air movement*. McGraw Hill Book Co.
3. Givoni, B. (1994). *Passive and low-energy cooling of buildings*. Van Nostrand Reinhold Co.
4. Guzowski, M. (2000). *Daylighting for sustainable design*. McGraw Hill (Professional Architecture Series).
5. Hyde, R. (2000). *Climate responsive design: a study of buildings in moderate and hot humid climates*. E & F N Spon, London.
6. Majumdar, M. (Ed.) (2002). *Energy efficient buildings in India*. MNES/TERI.
7. Nayak J. K. et.al. (1999). *Manual on Solar Passive Architecture*. Solar Energy Center, Ministry of Non-Conventional Energy Sources, Government of India, New Delhi
8. Pita, E. G. (2002). *Air conditioning, principles and systems: an energy approach*. Prentice Hall of India.
9. Sayigh, A A M. (1991). *Energy conservation in buildings*. Pergamon Press, Oxford.
10. Shaw, Alexander. (1989). *Energy design for architects*. Fairmont Press, Lilburn.

### **ARC 406.4 : URBAN AND REGIONAL PLANNING**

#### **Course objectives:**

Evolution of settlement design, classification of settlements, planning methodologies, contribution of prominent planners, urban planning policies, urban renewal schemes and methodologies, regional planning principles and methodologies, constraints and factors of consideration for regional plans.

#### **Course contents:**

Aims and objectives and need for regional planning. Concept of region, types and classification of regions, delineation of planning regions by various techniques

Regional planning as a tool to integrate rural and urban areas

Regional analysis- Input output analysis – growth model, core periphery model, industrial location theory, agricultural land use model. Spatial structure of region – central place theory, growth pole and growth centers

Regional development pattern – Regional disparities Backward and developed Regions. Characteristics and reasons for backwardness; Multi level planning District planning, special area Development Programme and schemes.

**References:**

1. Allen G. Noble, et.al, (eds). (1998). *Regional Development and Planning for the 21<sup>st</sup> Century: New priorities New Philosophies*. Aldershot, USA.
2. David Mosse, et.al. (1998). *Development Process; concepts and Methods for working with complexity*. Routledge, London.
3. Isward Walter. (1960). *Methods of Regional Analysis – An Introduction to Regional Science*.
4. Chand Mahesh and U.K. Puri. (1983). *Regional Planning in India*. Allied Publishers, New Delhi.
5. Hamilton F,(eds). (1983). *Industrialisation in Developing and Peripheral Regions*. Croom Helm.

## **4] ARC 408 : ELECTIVE – II : [1 0 2 2]**

### **ARC 408.1 : ADVANCED URBAN DESIGN**

**Course objective:**

To impart training to students with relation to factual urban design issues and intervention.

**Course contents:**

Examples of good urban design; Works of important practitioners of urban design; Case studies of modern and contemporary urban interventions; Urban design issues in a real urban continuum; People - centric design and public participation; Urban Morphology and Urban Character – anatomy of an urban area; Circulation and urban design; Townscape analysis and visual studies;

Studies, surveys and analysis of an urban area; Formulation of issues for intervention.

**References:**

1. Broadbent, Geoffrey. (1990). *Emerging concepts in urban space design*. Van Nostrand Reinhold, London.
2. Christopher, Alexander. (1987). *New theory of urban design*. Oxford University Press.
3. Cullen, Gordon. (1968). *Townscape*. Architectural Press, London.
4. Gallion Arthur B and Eisner, Simon. (1963). *Urban Pattern : City Planning And Design*. Van Nostrand Reinhold, London.
5. Krier, Rob. (1984). *Urban Space*. Academy editions.
6. Lynch, Kevin. (2000). *Image of the city*. MIT Press, London.
7. Spreiregen, Paul D. (1965). *Urban Design: The Architecture of Towns and Cities*. McGraw Hill.

### **ARC 408.2 : ADVANCED LANDSCAPE DESIGN**

**Course objective:**

To give an exposure into the breadth of landscape architecture as a profession and to understand the complexities involved in landscape detailing.

**Course contents:**

Ecology and landscape design, Landscape conservation and Environmental landscapes; Introduction to Urban landscape design and its influence on our physical and visual environment; Hierarchy of Urban open spaces,

elements of urban landscape, recent trends in concepts and approaches to urban landscape design; Landscape detailing; Techniques of Site grading, site drainage; Parking layouts; Detailing of various elements of landscape; Application of landscape design principles and details for projects of moderate complexity; Master planning for large developments like Technology parks, Mixed Use developments, Institutional and Industrial campuses etc.

**References:**

1. Ward, Harris Charles & Dines, Nicholas T. (1988). *Time saver standards for landscape architecture design and construction data*. McGraw Hill, New York.
2. Shunsaku, Miyagi and Makoto, Yokohari. (1990). *Contemporary landscapes in the world. Process architecture*. Japan.
3. Simonds, John Ormsbee. (1983). *Landscape Architecture: A manual of site planning and design*. McGraw Hill, New York.
4. Birlested, Jan. (1998). *Relating Architecture to Landscape*. Eand F N Spon, London.
5. Booth, Norman K. and Hiss, James E. (1991). *Residential Landscape Architecture*. Prentice Hall, New Jersey.
6. Cerver, F A. (1997). *International landscape architecture*. F A Cerver, Spain.

**ARC 408.3 : ARCHITECTURAL CONSERVATION**

**Course objective:**

To develop understanding of the significance of historic buildings, cities and the knowledge systems embodied in it.

**Course contents:**

Definitions for the heritage components of built heritage; An overview of national and international approaches from UNESCO, ICCROM, A.S.I., GETTY foundation, International charters, Civic bodies etc.; Search for an Indian approach; Listing of monuments, recording techniques, Documentation techniques for buildings and other intangible heritage components; Understanding assessment and mapping the factors of deterioration; Concepts and prevailing practices in conservation, restoration, retrofitting, rehabilitation, consolidation, protection, adaptive reuse; Approaches in designing in the historic context, interpretation with examples in India and abroad; Concepts of heritage zones, identification and delineation criteria for historic urban fabrics; Issues and challenges, techno legal provisions, byelaws and interventions.

**References:**

1. Feilden, Bernard M. and Jokilehto, Jukka. (1998). *Management Guidelines for World Cultural Heritage Sites*. Rome: ICCROM.
2. Tandon, Rajeshwari, editor. (2002). *A Case for National Policy for Heritage Conservation & Management*. New Delhi: INTACH, August 2002.
3. Feilden, Bernard. (1989). *Guidelines for Conservation: A Technical Manual*. New Delhi: Indian National Trust for Art and Cultural Heritage (INTACH).
4. Indian National Trust for Art and Cultural Heritage (INTACH). (1999). *Architectural Heritage Division, New Delhi. Conserving the Heritage of Our Historic Cities: Pre Seminar Working Document*. New Delhi: INTACH.
5. Bisht, A.S., et al. (2000). *Conservation of Cultural Property in India*. Agam Kala Prakashan, Delhi.
6. Picard, Gilbert Charles. (1983). *Encyclopedia of Archeology*. Chancellor Press, London.

**ARC 408.4 : TRADITIONAL ARCHITECTURE**

**Course objective:**

To provides the students the general idea about the architecture, planning, and building in accord with Natural Law. It teaches to follow the rules of nature and to balance the five elements of universe.

**Course contents:**

Definition of the word "vastu"; development of vastushastra through centuries- categorization of shilpins; categorization of land by name, climate, use and location; characteristics of habitable land; fixing cardinal directions as per vastu; selection of materials, stone and timber.

Concept of universe; concept of Prakrithi and Purusha; concept of mandala. Scale and proportion used in Vastusastra – Traditional scale; Regional changes in actual measurement of the measuring rod - Standardization of measurements with respect to FPS system and MKS system.

Planning principles; Proportions used in the layout of roads (Muzhakkol) - Different category of roads - Different types of cities based on road layout - Different types of plots, Kshudrakshetram, Alpakshethram and very large plots - Division of large and very large plots. Fixing the size of the plot with respect to the size of the courtyard.

Basic unit of residence; Characteristics, planning and Types of Nalukettu with respect to kshetrakandam - Development of Nalukettu (horizontal and vertical) to higher forms - Material used in the construction. Importance of perimeter in the design of buildings-Yoni as an architectural formula, its measurements, its compliance with human scale.

Development of Temples - Planning of temples; Its vertical proportions - Construction details of the roof of sanctum - Different types of sanctums - Planning and designing of ancillary structures in Bahyahara- Proportioning of various spaces.

**References:**

1. Dr.P.K. Acharya. (1996). *Architecture Manasara*. Munshiram Manoharlal Publishers
2. Bruno Dagens. (1994). *Mayamata- volume 1 &2*. New Delhi: Indira Gandhi National Centre for the Arts
3. Dr. Achuthan & Dr. Balagopalan T.S. Prabhu, (1993). *Manushyalaya Chandrika Bhastyam*

**NINTH SEMESTER**

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**1] ARC 501 : PRACTICE SCHOOL – I : [0 0 0 25]  
(STAGE 1 OF PROFESSIONAL TRAINING)**

**Course objectives:**

To offer students an opportunity to work in an architect's office and get acquainted with the demands of the profession, including carrying out independent critical study of a building of architectural importance, study of an innovative building material and study of observed and drafted details.

**Course contents:**

The professional training shall be for duration of minimum five months in various aspects of architectural practice. During this period, the candidate shall produce four reports - Training Report, Building Study, Building Material Study and Detailing study. The Training Report shall consist of the various drawings, observations, technical graphic data, etc. worked on during the process of training. The Building study shall be a critical appraisal of one noted building. The Building Material study shall include pertinent data, characteristics and applications of a contemporary building material. The Detailing study shall deal with the various aspects of a construction detail. Professional training will be carried out as per the prescribed professional training rules listed out in the Training Manual.

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**TENTH SEMESTER**

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**1] ARC 502 : PRACTICE SCHOOL – II : [0 0 0 25]  
(STAGE 2 OF PROFESSIONAL TRAINING)**

**Course objectives:**

To offer students an opportunity to work in an architect's office and get acquainted with the demands of the profession, including carrying out independent critical study of a building of architectural importance, study of an innovative building material and study of observed and drafted details.

**Course contents:**

The professional training shall be for duration of minimum five months in various aspects of architectural practice. During this period, the candidate shall produce four reports - Training Report, Building Study, Building Material Study and Detailing study. The Training Report shall consist of the various drawings, observations, technical graphic data, etc. worked on during the process of training. The Building study shall be a critical appraisal of one noted building. The Building Material study shall include pertinent data, characteristics and applications of a contemporary building material. The Detailing study shall deal with the various aspects of a construction detail. Professional training will be carried out as per the prescribed professional training rules listed out in the Training Manual.

## D. SCHEME OF EXAMINATION (From Academic Year 2010 - 2011 Onwards)

Sl. No.	Subject Code	Subject Name	Lecture / Studio	Tutorial	Practical	CREDITS	Evaluation			Contact Hours
							In Sem	End Sem Theory	End Sem Jury / Practical	

### FIRST SEMESTER

1	ARC 101	Architectural Design I	6	0	0	6	50		50	6
2	ARC 103	Building Construction & Materials I	2	0	2	3	50	50		4
3	ARC 105	Architectural Graphics I	2	0	2	3	50	50		4
4	ARC 107	History Of Architecture I	1	0	2	2	50	50		3
5	ARC 109	Structures I	2	1	0	3	50	50		3
6	ARC 111	Visual Arts & Basic Design I	4	0	0	4	100			4
7	ARC 113	Communications Skills	1	0	2	2	50	50		3
8	ARC 115	Workshop Practice	1	0	2	2	100			3
Total			19	1	10	25	500	300		30

### SECOND SEMESTER

1	ARC 102	Architectural Design II	6	0	0	6	50		50	6
2	ARC 104	Building Construction & Materials II	2	0	2	3	50	50		4
3	ARC 106	Architectural Graphics II	2	0	2	3	100			4
4	ARC 108	History Of Architecture II	1	0	2	2	50	50		3
5	ARC 110	Structures II	2	1	0	3	50	50		3
6		ARC 112 Visual Arts & Basic Design II	4	0	0	4	100			4
7	ARC 114	Society & Built Environment	1	0	2	2	50	50		3
8	ARC 116	Environmental Studies	1	0	2	2	50	50		3
Total			19	1	10	25	500	300		30

### THIRD SEMESTER

1	ARC 201	Architectural Design III	6	0	0	6	50		50	6
2	ARC 203	Building Construction & Materials III	2	0	2	3	50	50		4
3	ARC 205	Architectural Graphics III	2	0	2	3	100			4
4	ARC 207	History Of Architecture III	1	0	2	2	50	50		3
5	ARC 209	Structures III	2	1	0	3	50	50		3
6	ARC 211	Building Services I	2	1	0	3	50	50		3
7	ARC 213	Principles Of Architecture	1	0	2	2	50	50		3
8	ARC 215	Computer Aided Design	2	0	2	3	100			4
Total			19	1	10	25	500	300		30

## FOURTH SEMESTER

1	ARC 202	Architectural Design IV	8	0	0	<b>8</b>	50		50	8
2	ARC 204	Building Construction & Materials IV	2	0	2	<b>3</b>	50	50		4
3	ARC 206	Surveying & Leveling	1	0	3	<b>2</b>	100			4
4	ARC 208	History Of Architecture IV	1	0	2	<b>2</b>	50	50		3
5	ARC 210	Structures IV	2	1	0	<b>3</b>	50	50		3
6	ARC 212	Building Services II	1	0	2	<b>2</b>	50	50		3
7	ARC 214	Climatology	2	1	0	<b>3</b>	50	50		3
8	ARC 216	Landscape Architecture	2	0	0	<b>2</b>	100			2
		Total	19	2	9	<b>25</b>	500	300		30

## FIFTH SEMESTER

1	ARC 301	Architectural Design V	10	0	0	<b>10</b>	50		50	10
2	ARC 303	Building Construction & Materials V	2	0	2	<b>3</b>	50	50		4
3	ARC 305	Building Codes & Byelaws	1	0	2	<b>2</b>	50	50		3
4	ARC 307	History Of Architecture V	1	0	2	<b>2</b>	50	50		3
5	ARC 309	Structures V	2	1	0	<b>3</b>	50	50		3
6	ARC 311	Building Services III	2	0	2	<b>3</b>	50	50		4
7	ARC 313	Passive Environmental Architecture	1	0	2	<b>2</b>	100			3
		Total	19	1	10	<b>25</b>	400	300		30

## SIXTH SEMESTER

1	ARC 302	Architectural Design VI	10	0	0	<b>10</b>	50		50	10
2	ARC 304	Building Construction & Materials VI	2	0	2	<b>3</b>	50	50		4
3	ARC 306	Working Drawing & Detailing	2	0	2	<b>3</b>	100			4
4	ARC 308	History of Architecture VI	1	0	2	<b>2</b>	50	50		3
5	ARC 310	Structures VI	2	1	0	<b>3</b>	50	50		3
6	ARC 312	Specification & Estimation	1	0	2	<b>2</b>	50	50		3
7	ARC 316	Human Settlements	1	0	2	<b>2</b>	50	50		3
		Total	19	1	10	<b>25</b>	400	300		30

## SEVENTH SEMESTER

1	ARC 401	Architectural Design VII	10	0	0	<b>10</b>	50		50	10
2	ARC 403	Interior Designing & Detailing	2	0	2	<b>3</b>	50	50		4
3	ARC 405	Housing	2	0	1	<b>3</b>	50	50		3
4	ARC 407	Principles of Urban Design	2	0	1	<b>3</b>	50	50		3
5	ARC 409	Structures VII	2	1	0	<b>3</b>	50	50		3
6	ARC 411	Research Techniques	2	0	2	<b>3</b>	50	50		4
		Total	20	1	6	<b>25</b>	300	300		27

**EIGHTH SEMESTER**

1	ARC 402	Thesis	18	0	0	<b>18</b>	300	-	300	18
2	ARC 404	Professional Practice	2	1	0	<b>3</b>	50	50	-	3
3	ARC 406	Elective I	1	0	2	<b>2</b>	50	50	-	3
4	ARC 408	Elective II	1	0	2	<b>2</b>	50	50	-	3
		Total	22	1	4	<b>25</b>	450	450		27

**NINTH SEMESTER**

1	ARC-501	Practice School – I : STAGE 1 (Professional Training)	Minimum 5 Months			<b>25</b>		150	300	-
		Total	-	-	-	<b>25</b>		450		-

**TENTH SEMESTER**

1	ARC-502	Practice School – II : STAGE 2 (Professional Training)	Minimum 5 Months			<b>25</b>		150	300	-
		Total	-	-	-	<b>25</b>		450		-