SRM UNIVERSITY
(Under section 3 of UGC Act 1956)

B.ARCH. Regulation
Curriculum & Syllabus – 2011

(For students admitted from the academic year 2011-12)

Faculty of Engineering and Technology

SRM UNIVERSITY
SRM Nagar, Kattankulathur

Faculty of Engineering and Technology

SRM UNIVERSITY
SRM Nagar, Kattankulathur
Chennai, India

B.ARCH REGULATIONS
(For students admitted from the academic year 2011-12)

REGULATIONS

R.1.0 Admission

R.1.1 The number of seats in the B.Arch program for which admission is to be made in the Faculty of Engineering and Technology will be decided by the Board of Management of SRM University and approved by the Council of Architecture, New Delhi.

R.1.2 Admission to the B.Arch program in any year will be based on the aggregate of marks obtained in the qualifying examinations and the score secured in the Aptitude test in Architecture conducted by SRM University or National Aptitude Test in Architecture (NATA) conducted by the Council of Architecture. **(R.1.5)**

R.1.3 The eligibility criteria in the qualifying examination and the minimum pass mark required for NATA is stipulated by the Council of Architecture from time to time and in accordance with **R.1.5.** and the minimum pass marks required in the Aptitude test in Architecture conducted by SRM University is stipulated by the University admission committee.

R.1.4 The Admission Committee will prepare a merit list, giving 50% weightage to the marks secured in the qualifying examination and another 50% weightage to the Aptitude test in Architecture conducted by SRM University or NATA score, as stipulated by the Council of Architecture. According to the merit list the Committee will offer admissions through Counseling, taking into account the number of available seats.

R.1.5 The minimum qualification for admission to B.Arch degree program should be a pass in the (10 +2) Higher Secondary examination or any other equivalent examination of any authority, recognized by this University, with minimum total aggregate of 50% marks and Mathematics as a subject of study.

R.1.6 Diploma holders in Civil Engineering / Architecture with minimum marks, as stipulated by the Admission Committee, are eligible for admission only to the first semester of the B.Arch program as their 10 +3 scheme of study is considered equal only to the 10+2 scheme of study of higher secondary level by the Council of Architecture, New Delhi. Hence there is no lateral entry to the 3rd semester of the B.Arch program.

R.1.7 Not withstanding the above, the actual admissions will be based on the rules and regulations of the UGC/ competent authorities.

R.1.8 Candidates have to fulfill the medical standards required for admission as set out by the Admission Committee.

R.1.9 The selected candidate will be admitted to the B.Arch programme after he/ she fulfills all the admission requirements as indicated in the letter of admission after payment of the prescribed fees.

R.1.10 In the matter of admissions to the B.Arch programme the decision of the Admission Committee is final.

R.1.11 If, at any time after admission, it is found that a candidate has not fulfilled all the requirements stipulated in the offer of admission, the Director (Engineering and Technology) may revoke the admission of the candidate and report the matter to the Vice Chancellor.

R.2.0 Structure of the B.Arch programme

R. 2.1. The programme will have a curriculum with syllabi consisting of

i) Theory based courses such as History of Architecture, Analysis and Design of structures etc.,

ii) Theory cum Studio based courses comprising of courses on Building Materials and Construction, Interior Design etc.

iii) Studio based courses comprising of courses on Architectural Design Studio, computer aided drawing etc.

iv) Elective Courses for specialization in related fields.

v) A professional training in the IX Semester for exposure to the Architectural profession.

vi) Documentation

vii) Architectural Design Exam

viii) Thesis work in the X semester.

ix) Two Compulsory Educational Tours apart from the site / field visits.

R.2.2 Professional Training

Students have to undergo practical training for duration of one semester with minimum of 80 working days, during the IX semester of the course in an approved architectural firm under an Architect. This firm should be an established one of at least five years of existence or the training can be taken up in registered government / private organizations such as CMDA, PWD, INTACH etc. The portfolio of the drawings and work diary done during the training period will be assessed at the end of the semester by faculty members (internal). Moreover it has to be certified by the concerned Architect / organization for the successful completion of the practical training. The students should arrange to send monthly progress reports from the respective offices imparting training.

R.2.3 Documentation

Students are required to study and document heritage buildings or contemporary buildings of architectural merit for a duration of one month. This study will be undertaken by student groups of maximum four members and they will be required to prepare detailed plans, elevations and sections etc. of the building under study. This documentation work will be evaluated at the end of the month by a panel of internal and external examiners.

R.2.4 Architectural Design Exam

Design examination will be conducted at the end of every academic year to test the design skills of the student to the extent of fulfillment of the problem. This examination will be of 6 hrs. / 12 hrs./ 18 hrs. duration at the end of 2nd, 4^{th}& 6^{th} semester respectively. Students will be required to be enlodge during the first day and should submit the conceptual scheme drawings at the end, which will not be returned to them. They will be required to do the presentation drawings which will not deviate substantially from the conceptual scheme drawings and submit the same after the duration of the examination. Lunch break will be allowed during the second and third day of the examination.

R.2.5 Educational Tour

Every student is required to undertake an educational tour approved by the department to various places of Architectural interest in South India within the first two years and another educational trip to North India during third or fourth year of the B.Arch. program.

R.2.6 Site / Field Visit

Every student is required to undergo at least one site or field visits each semester for courses like Architectural Design Studio, Building Materials and construction starting from the first semester of the programme.

R.2.7 The B.Arch programme will have a curriculum and course contents (syllabi), approved by the Academic Council.

R.2.8 Credits are assigned to the courses based on the following general pattern:

One credit for each lecture period;

One credit for each tutorial period;

One credit for each practical session comprising of two periods.

R.2.9 The curriculum of the B.Arch programme is designed to have a total of 214 credits for the award of the B.Arch degree. Hence the minimum number of credits to be earned by the candidate for the award of B.Arch Degree is 214 credits.

R.2.10 The medium of instruction, examination and project reports will be in English.

R.3.0 Faculty Adviser

R.3.1 To help the students in planning their courses of study and for getting general advice on the academic programme, the school will assign a certain number of students to a faculty member who will be called their Faculty Adviser.

R.4.0 Class Committee

R.4.1 Every class (comprising of sections) of the B.Arch programme will have a class Committee consisting of Faculty and students. The class committees of the School for each semester will be constituted by the Head of the School.

R.4.2 The constitution of the Class Committees of the School for each semester will be as follows:

a. All teachers of the courses

b. Four students from the top half of the class to be chosen by the students of the class from amongst themselves

c. One professor of the concerned School, preferably not associated with teaching of the class, to be nominated by the concerned Head of the School, to act as the Chairman of the Class Committee.

d. Faculty Adviser(s) of the respective class.

R.4.3 The basic responsibilities of the Class Committee are

a. To review periodically the progress of the classes

b. To discuss problems concerning curriculum and syllabi and the conduct of the classes.

c. The method of assessment in the courses will be decided by the teachers in consultation with the class committees and will be announced to the students at the beginning of the semester

d. The class Committee without student members is responsible for the finalization of the semester results.

e. The class committees shall meet at least thrice in a semester, once at the beginning of the semester, once after the mid sem exam and once at the end of the semester to finalize the grades.

R.5.0 Registration and Enrolment

R.5.1 Registration and enrolment of any course will be controlled by the Office of the Controller of Examinations. Except for the first semester, the registration of a semester will be done during a specified week before the end semester examination of the previous semester.

R.5.2 From the second semester onwards all students have to enroll on a specified day at the beginning of a semester. A student will be eligible for enrolment only if he/she satisfies **R.9** and will be permitted to enroll only if he/she has cleared all dues to the University, Hostel, Library, NCC etc., up to the end of the previous semester, provided he/she is not debarred for enrolment by a disciplinary action of the University.

R.5.3 The registration sheet contains the course number, course name, number of credits and category for each course taken in that semester. The student makes the choice of course in consultation with his/ her Faculty Adviser.

R.6.0 Registration Requirement

R.6.1 The curriculum for any semester, except for the IX & X semesters will normally carry credits between 22 and 26.

If a student finds his / her load heavy in any semester, or for any other valid reason, he/she may drop course(s) within three weeks with the approval of his/her faculty Adviser and Head of the School.

However the student should ensure that the total number of credits registered in any semester should enable him/her to earn the minimum number of credits as specified **in R.9.1**

R.7.0 Compensatory courses

R.7.1 Compensatory courses may be offered by a School/Department, by the Deans/HODs, with the approval of the Director (E&T). The course will be conducted during the regular academic session either during the weekends or in the evenings after the regular classes as decided by the Director (E&T) and the number of hours that will be conducted will be 75% of the hours specified in the curriculum for a course. Maximum two courses will be permitted to a student during the semester. The evaluation process will be the same as that of regular semester.

Courses will be offered by departments only to students detained for lack of attendance in those subjects (Grade W, R.18.1). However, failed students (Grade U, R.18.1) and students who were absent (Grade I, R.18.1) can also register for the courses, when they are offered to students detained for lack of attendance.

No student should register for more than two compensatory courses offered during a semester.

R.7.2 Compensatory courses will be announced by the Director (E&T) after the publication of results of end semester examinations of odd/even semester and the conduct of these courses will not go beyond the last working day of the semester. A student will have to register within the time stipulated in the announcement by paying the prescribed fees.

R.8.0 Withdrawal from Compensatory courses

R.8.1 Withdrawal from Compensatory courses is not permitted

R.9.0 Minimum Requirement to Continue the Programme.

R.9.1 To be eligible for admission to third semester B.Arch. a student should have earned a minimum of 14 credits. To be eligible for admission to fifth semester B.Arch, a student should have earned a minimum of 28 credits at the end of fourth semester. To be eligible for admission to seventh semester B.Arch, a student should have earned a minimum of 42 credits at the end of sixth semester. To be eligible for admission to ninth semester B.Arch, a student should have earned a minimum of 56 credits at the end of eighth semester

Year & Semester	Minimum Requirement to Continue the Programme.
Eligible for admission to Third Semester (II Year)	14 Credits
Eligible for admission to Fifth Semester (III Year)	28 Credits
Eligible for admission to Seventh Semester (IV Year)	42 Credits
Eligible for admission to Ninth Semester (V Year)	56 Credits

R.9.2 A student who is not eligible for promotion from an even semester to the next higher (odd) semester for reasons of having not earned the prescribed minimum number of credits will have to discontinue the programme temporarily. He/she can rejoin the programme after fulfilling the academic performance requirements as in **R.9.1**.

R.9.3 Students has earned less than 75% attendance in all individual courses is not eligible for enrolment to next academic session. He / She shall discontinue the study temporarily & rejoin the program in the next academic year & seek readmission

R.9.4 Students who has earned 75% attendance in all individual subjects has not applied for end-semester examination. Refer clause 9.3

R.9.5 Students who has earned 75% attendance in all individual subjects & applied for end-semester examination should appear for minimum of one end semester examination failing which the candidate is not eligible for enrolment next semester. Refer clause 9.3.

R.10.0 Maximum duration of the programme

R.10.1 Each semester shall normally consist of 90 working days or 450 hours. A student is ordinarily expected to complete the B.Arch programme in ten semesters. However a student may complete the programme at a slower pace by taking more time but in any case not more than 16 semesters under regular programme excluding the semesters withdrawn on medical grounds etc, as per **R.11.1**.

R.11.0 Temporary withdrawal from the programme

R.11.1 A student may be permitted by the Director (E&T) to withdraw from the programme for a semester or longer for reasons of ill health or other valid reasons. Normally a student will be permitted to discontinue from the programme only for a maximum continuous period of two semesters.

R.12.0 Discipline

R.12.1 Every student is required to observe discipline and decorous behavior both inside and outside the University campus and not to indulge in any activity that will tend to bring down the prestige of the University.

R.12.2 Any act of indiscipline of a student is first to be considered by the Discipline and Welfare Committee of the School for necessary action. If the issue demands more serious consideration, the indiscipline will be reported to the Director (E&T), and he will refer it to the Discipline and Welfare Committee of the University, constituted by the Vice Chancellor.
The Committee will enquire into the charges and recommend suitable punishment if the charges are substantiated. The Director (E&T) will consider the recommendation of the Discipline and Welfare Committee and take appropriate action.

R.12.3 Appeal: The student may appeal to the Vice Chancellor whose decision will be final and binding.

R.13.0 Attendance

R.13.1 Attendance is the physical presence of the student in the class. It is a well observed fact that the students who score good grades are those who attend classes regularly. Therefore, the students must strive to attend all the classes without fail.

R.13.2 The percentage of attendance will be indicated by a code number / letter as follows:

Attendance- Rounded to	**Code**
95% and above	H
85 to 94%	9
75 to 84%	8
Below 75%	L

The attendance code is not applicable to professional training, documentation, thesis and architectural design exam.

R.13.3. A student must maintain an attendance record of at least 75% in individual courses. Without securing the minimum attendance of 75%, in any course, students become ineligible to write the end semester examination in that subject. His/her registration for that course will be treated as cancelled, and he/she shall be awarded **'W' grade** (W stands for registration cancelled for want of minimum attendance) in that course. This grade shall appear in the grade card until the course is successfully completed.
The student should register for and repeat the course when it is offered next.

R.13.4 The student must strive to attend all the classes without fail. However, the minimum attendance requirement of 75% allows a student the facility to use the balance 25% to account for short illnesses of a

few days, permitted assignments such as job interviews, inter university sport meets, inter collegiate/ inter-university competitions, etc.

R.13.5 The teacher shall announce the particulars of all students who have attendance less than 75% in that course in the class. Copies of the same will be sent to the Director (E&T), and Heads of Schools/ Departments concerned. **The students who have less than 75% attendance will not be permitted to sit for the end semester examination.**

R.14.0 Assessment procedure

R.14.1 The complete academic performance of a student is evaluated internally by the concerned teachers/departments.

R.14.2 The student's performance in each theory course is evaluated for a maximum of 100 marks of which 50 marks for in-semester assessment and 50 marks for the end semester examination.

R.14.3 The in-semester assessment in theory subjects is based on mid-term test and Seminar / test. The student shall be informed sufficiently early of the procedure to be followed for in-semester assessment

R.14.4 The student performance in Studio based courses(except Architectural Design Exam, which will be evaluated for 100 marks during the end semester and NCC/NSS/NSO/Yoga, which will be evaluated for 100 marks internal) is evaluated for a maximum of 100 marks. In-semester assessment will be based on the work done by the student in the class, and assignments etc. for 50 marks and end semester assessment will be done by an external examiner through viva voce exam of the portfolio for the remaining 50 marks. The student shall be informed sufficiently early of the procedure to be followed for in-semester assessment.

R.14.5 The student's performance in theory cum studio based courses is evaluated for a maximum of 100 marks of which 50 marks for in-semester assessment and 50 marks for the end semester examination. The in-semester assessment in theory cum studio based courses is based on mid-term test and Seminar / portfolio. The student shall be informed sufficiently early of the procedure to be followed for in-semester assessment

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R.14.6. The student's performance in professional training will be through a viva-voce examination conducted at the end of the training period for 100 marks by a panel of internal examiners.

R.14.7. The student's performance in Documentation will be evaluated through a viva-voce examination conducted at the end of the documentation period for 100 marks. The viva voce will be by a panel consisting of an internal examiner and an external examiner appointed by the University. If the student fails to pass in the documentation work he/she will be required to improve the same and submit the work for evaluation in the subsequent examination.

R.14.8. The student's performance in Architectural Design Exam of duration varying from 6 to18 hours for various semesters will be through a panel consisting of an internal examiner and an external examiner appointed by the University for 100 marks. If the student fails to pass in the Design exam he/she will be required to appear for the same in the subsequent examination.

R.15.0 System of tests

R.15.1 In theory courses for all semesters, the first assessment will be mid-term test and the second assessment will be a seminar / test. Both the assessments will be conducted for 25 marks each (total 50).

R.15.2 For studio based courses (except Architectural Design Exam and NCC/NSS/NSO/Yoga) the portfolio of work will be evaluated individually for the total sessional marks of 50. The mode of assessment will be announced during the class committee meetings.

R.15.3 For theory cum studio courses, the first assessment will be mid-term test and the second assessment will be a seminar / portfolio. Both the assessments will be conducted for 25 marks each (total 50).

R.15.4 Absolute marks will be awarded for all tests, seminar, portfolio and examinations. The final percentage of marks will be calculated for award of grade according to the details given in R.15.1, R.5.2 and R.15.3

R.16.0 End semester examination

R.16.1 There will be one end semester examination of three hours duration in each theory based course and theory cum studio based course.

R.16.2 The examinations at the end of a particular semester will be conducted for the courses of all odd and even semesters.

R.16.3 A student should have appeared for the end-semester examination of the prescribed course of study to be eligible for the award of the grade in that course.

R.17.0 .Project evaluation (Thesis)

R.17.1 B.Arch projects as for as possible should be socially relevant and attempt to improve existing design standards in buildings. B.Arch thesis project work will be carried out individually by the students. The internal assessment for 50% of the marks will be done by a thesis review committee, comprising of a renowned practicing architect, the head of department and the guide at least once in a month to monitor the progress. At the completion of a project the student will submit a project report, the presentation drawings and models, which will be evaluated by duly appointed examiner(s). The evaluation will be based on a viva voce examination of the project at the end of the semester for the remaining 50% of the marks. The grade will be awarded to the student on the basis of the total marks obtained by him/her out of 100.

R.17.2. If the candidate fails to secure a pass in thesis project, he/she will be required to improve the project work based on the suggestions given by head of the department and the thesis guide and appear for the viva-voce examination during the end of the subsequent semester.

R.18.0 Re appearance in End Semester Examination

Students who have secured U, W or I grade in a particular course can reappear when the end semester examination for that course is again conducted provided they satisfy other eligibility conditions such as lack of attendance overcome by attending Compensatory courses (R.7.0 and R 13.0) and minimum credit requirements (R. 9.0), Temporary withdrawal from the programme (R.11.0) and Discipline (R.12.0).

R.19.0 Course wise grading of students

R.19.1 Letter Grades and Grade points

Based on the semester performance, each student is awarded a final letter grade at the end of the semester in each course. The letter grades and the corresponding grade points are as follows.

A+10 grade points
A 9.5 grade points
A- 9.0 grade points
B+ 8.5 grade points
B 8.0 grade points
B- 7.5 grade points
C+ 7.0 grade points
C 6.5 grade points
C- 6.0 grade points
D 5.0 grade points
E 4.0 grade points
U 0 grade points
W 0 grade points (Failure due to insufficient attendance in the course)
I 0 grade points (Incomplete, Subsequently to be changed into pass (E to A +) or U grade in the same semester).

R.19.2 A student is considered to have completed a course successfully and earned the credits if he secures a letter grade other than U or W or I in that course. **A letter grade U or W in any course implies a failure in that course.**

R.20. 0 Method of Awarding Letter Grades.

R.20.1. A final meeting of the class committee without student members will be Convened after the end-semester examination. The letter grades to be awarded to the students for different courses will be finalized at the result passing board meeting.

R.21.0 Declaration of Results

R.21.1 After the finalization by the Class committee as per **R.20.1** the letter grades awarded to the students will be announced by the Controller of Exanimations

R.21.2.The W grade once awarded stays in the record of the student and is deleted when he/she completes the course successfully later. The grade acquired by the student will be indicated in the grade card of the appropriate semester with an indication of the month and the year of passing of that course

R.21.3 'U' grade obtained by a student will be deleted in the grade card once that course is successfully Completed. The pass grade acquired by the student will be indicated in the grade card of the appropriate semester with an indication of the month and the year of passing. The CGPA will be accordingly revised.

R.22.0 Re-examination of Answer Papers.

R.22.1 In case any student feels aggrieved, he can contact the teacher concerned after the commencement of the semester immediately following the announcement of the results

The student shall have access to his / her answer paper (s) in the end semester examination, which may be shown to him by the teacher(s) concerned. In reviewing the answer scripts, if the teacher feels that the case is genuine he may re-examine the case and forward a revised grade, if any, to the Controller of Examinations through the Chairman of the class committee with justification for the revision and with intimation to the Head of the School.

R.23.0 Course Repetition

R.23.1 A student securing W grade in a course has to repeat it compulsorily when the course is offered next through Compensatory courses. A student securing U or W grade in a course, may repeat it through Compensatory courses if he so desires. In all such cases the award of internal marks shall be based on his performance in Compensatory courses

A course successfully completed cannot be repeated.

R.24.0 Grade Card

R.24.1 The grade card issued by the Controller of Examinations at the end of the semester to each student will contain the following.

a. The credits for each course registered for that semester.
b. The letter grade obtained in each course
c. The attendance code in each course except professional training, documentation, thesis and architectural design exam.
d. The total number of credits earned by the student up to the end of that semester in each of the course categories.
e. The cumulative Grade point Average (CGPA) of all the courses taken from the first semester.

R.24.2 The GPA will be calculated according to the formula

$$GPA = \frac{\sum(C \times GP)}{\sum C}$$

Where C = credit for the course, GP= the grade point obtained for the course and the sum of all the courses taken in that semester, including those in which the student has secured U and W grades.

For the cumulative grade point average (CGPA) a similar formula is used where the sum is over all the courses taken, including those in which the student has secured U and W grades, in all the semesters completed up to the point in time.

For the award of class/Distinction, CGPA will be calculated from the first semester onwards

R.24.3 Class/Distinction will be awarded to the students after they successfully complete the B.Arch. programme within the time duration of 10 semesters as per norms given below.

CGPA ≥ 4 & < 5 - Pass

CGPA ≥ 5 & < 6 Second Class

CGPA ≥ 6 & < 8.5 First Class

CGPA ≥ 8.5 First Class with Distinction, if without history of arrears in any semester.

R.24.4 Class/Distinction will be awarded to the students who fail to complete within 10 semesters but successfully complete the B.Arch. programme within the time duration of 11 semesters as per norms given below.

CGPA ≥ 4 & < 5 - Pass

CGPA ≥ 5 & < 6 Second Class

CGPA ≥ 6 First Class

R.24.5 Class/Distinction will be awarded to the students who fail to complete within 11 semesters but successfully complete the B.Arch programme within the time duration of 16 semesters as per norms given below

CGPA ≥ 4 & < 5 - Pass

CGPA ≥ 5 Second Class

R.25.0 Scholarships and Tuition fee Exemption

R.25.1 A certain percentage of the students admitted will be awarded merit-cum-means scholarship or fee Concessions subject to the terms and conditions stipulated from time to time.

R.26.0 Eligibility for Award of the B.Arch Degree

R.26.1 A student shall be declared to be eligible for the award of the B.Arch degree if he/she has

a. Registered and successfully completed all the courses and projects as per the curriculum.
b. Successfully acquired the minimum required credits as specified in the curriculum.
c. No disciplinary action pending against him/her.
d. Two Compulsory Educational Tours apart from the site / field visit.

R.27.0 Change of Regulations

R.27.1 Any regulations can be modified by the Academic Council of SRMU.

R.28.0 Date of Approved

R.28.1 6TH Academic council meet dated on 26/03/2011
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S.R.M UNIVERSITY
SCHOOL OF ARCHITECTURE & INTERIOR DESIGN
CURRICULUM FOR BACHELOR OF ARCHITECTURE (B.Arch) - 2011

I SEMESTER

Code	Subject Title	L	T	P	C
THEORY BASED COURSES					
MA 0121	Mathematics for Architects	2	0	0	2
LE 0101	English	2	0	0	2
ARC 101	Theory of Architecture	3	0	0	3
ARC 103	Art Appreciation	3	0	0	3
THEORY CUM STUDIO BASED COURSES					
ARC 105	Building Materials & Construction – I	1	0	3	3
STUDIO COURSES					
ARC 107	Architectural Graphics – I	1	0	3	3
ARC 109	Basic Design & Visual Arts	0	0	12	6
GE 0107	NCC/NSS/NSO/Yoga	0	0	2	1
	TOTAL	**12**	**0**	**20**	**23**

II SEMESTER

Code	Subject Title	L	T	P	C
THEORY BASED COURSES					
ARC 102	Structural concepts in Architecture	3	0	0	3
ARC 104	History of Indian Architecture	3	0	0	3
ARC 106	Culture & Architecture	3	0	0	3
LE 0105	Communication Skills in English	2	0	0	2
THEORY CUM STUDIO BASED COURSES					
ARC 108	Building Materials & Construction – II	1	0	3	3
STUDIO COURSES					
ARC 110	Architectural Delineation & Model making	0	0	3	2
ARC 112	Architectural Graphics – II	1	0	3	3
ARC 114	Architectural Design Studio – I	0	0	12	6
ARC 116	Architectural Design Exam – 1st year	0	0	0	1
	TOTAL	**13**	**0**	**21**	**26**

III SEMESTER

Code	Subject Title	L	T	P	C
THEORY BASED COURSES					
ARC 201	Structural Mechanics	3	0	0	3
ARC 203	History of European Architecture I	3	0	0	3
ARC 205	Climate responsive Architecture	3	0	0	3
ARC 207	Design Theory	2	0	0	2
GE 0108	Value Education	1	0	0	1
THEORY CUM STUDIO BASED COURSES					
ARC 209	Building Services I	2	0	2	3
ARC 211	Building Materials & Construction – III	1	0	3	3
STUDIO COURSES					
ARC 215	Architectural Design Studio with CAD- II	0	0	14	7
	TOTAL	**15**	**0**	**19**	**25**

IV SEMESTER

Code	Subject Title	L	T	P	C
THEORY BASED COURSES					
ARC 202	Steel & Masonry Structures	3	0	0	3
ARC 204	History of European Architecture II	3	0	0	3
ARC 206	Site Planning	2	0	0	2
THEORY CUM STUDIO BASED COURSES					
ARC 208	Building Services II	2	0	2	3
ARC 210	Building Materials & Construction –IV	1	0	3	3
STUDIO COURSES					
ARC 212	3D Modeling & Image editing	0	0	3	2
ARC 214	Architectural Design Studio – III	0	0	14	7
ARC 216	Architectural Design Exam – 2nd yr	0	0	0	1
	TOTAL	**11**	**0**	**22**	**24**

V SEMESTER

Code	Subject Title	L	T	P	C
THEORY BASED COURSES					
ARC 301	Reinforced Concrete Structures	3	0	0	3
ARC 303	Earthquake resistant Architecture	2	0	0	2
ARC 305	Contemporary Western Architecture	3	0	0	3
	Elective – I	2	0	0	2
THEORY CUM STUDIO BASED COURSES					
ARC 307	Building Materials & Construction – V	1	0	3	3
STUDIO BASED COURSES					
ARC 309	Parametric Modeling	0	0	3	2
ARC 311	Architectural Design Studio – IV	0	0	14	7
	TOTAL	**11**	0	**20**	**22**

VI SEMESTER

Code	Subject Title	L	T	P	C
THEORY BASED COURSES					
ARC 302	Precedents in Architecture	3	0	0	3
ARC 304	Architectural Acoustics & Lighting	2	0	0	2
ARC 306	Green Buildings	3	0	0	3
ARC 308	Contemporary Indian Architecture	3	0	0	3
	Elective II	2	0	0	2
THEORY CUM STUDIO BASED COURSES					
ARC 310	Interior Design	2	0	2	3
STUDIO BASED COURSES					
ARC 312	Architectural Design and Studio – V	0	0	16	8
ARC 314	Architectural Design Exam– 3rd year	0	0	0	1
	TOTAL	**15**	**0**	**18**	**25**

VII SEMESTER

Code	Subject Title	L	T	P	C
THEORY BASED COURSES					
ARC 401	Estimation & Specification	2	0	0	2
ARC 403	Project Management	3	0	0	3
	Elective – III	2	0	0	2
	Elective – IV	2	0	0	2
THEORY CUM STUDIO BASED COURSE					
ARC 405	Urban Design & Renewal	2	2	0	4
ARC 407	Landscape Architecture & Environmental Sciences	2	2	0	4
STUDIO BASED COURSES					
ARC 409	Architectural Design Studio – VI	0	0	16	8
	TOTAL	**13**	**4**	**16**	**25**

VIII SEMESTER

Code	Subject Title	L	T	P	C
THEORY BASED COURSES					
ARC 402	Professional Practice	3	0	0	3
ARC 404	Architectural Conservation	3	0	0	3
ARC 406	Housing	2	0	0	2
ARC 408	Town Planning & Human Settlements	3	0	0	3
	Elective V	2	0	0	2
	Elective VI	2	0	0	2
STUDIO BASED COURSES					
ARC 410	Architectural Design Studio – VII	0	0	16	8
	TOTAL	**15**	**0**	**16**	**23**

IX SEMESTER

Code	Subject Title	L	T	P	C
ARC 501	**Professional Training**	0	0	0	6
ARC 503	**Documentation**	0	0	0	2
TOTAL		**0**	**0**	**0**	**8**

Note :

1. The work diary and drawings done by the candidate in a registered Architectural Office for professional training will be evaluated for 100 marks (internal).
2. Documentation of any Heritage Building / Architectural landmark will be done as group work for a period of 1 month and will be evaluated for 100 marks (external).

X SEMESTER

Code	Subject Title	L	T	P	C
ARC 504A	**Thesis**	0	0	28	13
	TOTAL	0	0	28	**13**

. **Total no. of credits : 214**

Note:

The students should have 214 credits to get B.Arch Degree Certificate

LIST OF ELECTIVES

Electives	Code	Subject Title	L	T	P	C
Elective - I	ARC 351	Set Design	2	0	0	2
	ARC 353	Vernacular Architecture & Settlements	2	0	0	2
Elective - II	ARC 352	Applied Ergonomics	2	0	0	2
	ARC 354	Architectural Photography & journalism	2	0	0	2
Elective – III	ARC 451	Environment Planning	2	0	0	2
	ARC 453	Urban Economics & Sociology	2	0	0	2
Elective - IV	ARC 455	Furniture Design & Product Design	2	0	0	2
	ARC 457	Behavioral Architecture	2	0	0	2
Elective - V	ARC 452	Advanced Structures	2	0	0	2
	ARC 454	Industrial Building Systems	2	0	0	2
Elective - VI	ARC 456	Services in Tall buildings	2	0	0	2
	ARC 458	Sustainable Building Design	2	0	0	2

Mark split up for Internal & External

Theory Based courses

Internal marks split up (50 Marks)		**External (50 marks)**
Component - 1	Component - 2	
Midterm test & seminar– 25 marks	Model Examination or assignment – 25 Marks	50 marks

Theory cum studio based courses

Subjects	**Internal mark split up (50 Marks)**		**External (50 marks)**
	Component - 1	Component - 2	
Building materials & Construction I – V (1st to 5th semester)	Midterm test – 25 marks	Portfolio – 25 marks	50 marks
ARC310-Interior design			
ARC405-Urban design & renewal			
ARC407-Landscape Architecture & Environmental sciences			
Building services I & II (3RD & 4th semester)	Midterm test – 25 marks	Model Examination – 25 Marks	

Studio courses:

1. There are 2 design problems for Architectural design studio I - VII (2nd semester to 8th Semester) the internal marks & External marks split up are given below:

Internal marks split up (50 Marks)		**External (50 marks)**
Component - 1	Component - 2	
Design Project 1 30 marks	Design project 2 20 marks	50 marks (To be evaluated by the external Examiner)

2.

Subjects	Internal mark split up (50 Marks)		External (50 marks)
	Component - 1	Component - 2	
ARC1O7 – Graphics-I	Midterm test – 25 marks	Portfolio – 25 marks	50 marks (To be evaluated by the external Examiner)
ARC112 – Graphics -II			

Subject	**Internal Mark split up (50 Marks)**	**External (50 marks)**
ARC109 - Basic design & visual arts	Internal marks split up based on the number of exercises.	50 marks (To be evaluated by the external Examiner)
ARC110 - Architectural delineation & Model Making		
ARC309 – Parametric modeling		
ARC212 - 3D Modeling & image editing		

Subject	**Internal Mark split up**	**External**
GE0107-NCC/NSS/NSO/Yoga	Internal Marks 100 evaluated by the internal faculty	-
ARC116-Architectural design Exam – 1st year		100 marks(To be evaluated by the

ARC216-Architectural design Exam – 2nd year ARC314-Architectural design Exam – 3rd year		external Examiner)
ARC501-Professional training	100 marks(To be evaluated by the internal faculty)	-
ARC503-Documentation	-	100 marks(To be evaluated by the external Examiner)
ARC504-Thesis	50marks (Mark split up based on the Number of Reviews)	50 marks(To be evaluated by the external Examiner)

FOR STUDIO BASED COURSES THE MARK SPLIT UP IS GIVEN BELOW

(A) BASIC DESIGN

Assessment tool	**Weightage**	**Split up of marks**		
Continuous assessment of plates	50	Concept	Design Development	Presentation
		15	20	15
Total in-semester assessment	**50** Marks			
End semester viva/voce	**50** Marks	Concept	Design Development	Presentation
		15	20	15

(B) ARCHITECTURAL DESIGN STUDIO I,II,III,IV,V,VI,VII (2nd to 8TH Semester)

Assessment tool	**Weightage**	**Split up of marks**		
Project 1(Major project)	30 Marks	Concept	Design Development	Presentation
		10	10	10
Project 2 (Minor Project)	20 Marks	Concept	Design Development	Presentation
		7	6	7
Total in-semester assessment	**50 Marks**			
Project 1(Major project)	30 Marks	Concept	Design Development	Presentation
		10	10	10
Project 2 (Minor Project)	20 Marks	Concept	Design Development	Presentation
		7	6	7
End semester viva/voce	**50** Marks			

(C). PROFESSIONAL TRAINING

Assessment tool	**Weightage**	**Split up of marks**		
Total in-semester assessment	**100** Marks	Work diary	Plates	Viva/voce
		20	40	40

(D). DOCUMENTATION

Assessment tool	**Weightage**	**Split up of marks**		
End semester viva/voce	**100** Marks	Choice of project	Plates	Viva/voce
		20	40	40

(E). Architectural Design Exam

Assessment tool	**Weightage**	**Split up of marks**			
End Semester exam	**100** Marks	Concept	Plan	Section	Elevation & Views
		30	20	20	30

(F). Project evaluation (Thesis)

Assessment tool	**Weightage**	**Remarks**		
Review 1	10			
Review 2	10			
Review 3	10			
Review 4	10			
Internal Review	10			
Total in-semester assessment	**50** Marks			
End semester viva/voce	**50** Marks	**Split up of marks**		
		Concept	Design Development	Presentation
		15	20	15

Note:

ARC 504 A – THESIS:

The students should get minimum of 50 marks out of total 100 marks with both internal & external put together.

SCHEME OF EXAMINATION

Course	**Duration of End semester examinations (In Hours)**	**Internal assessment Marks**	**End semester exam Marks**	**Total**	**Attendance code**
All Theory Courses	3 hrs.	50	50	100	Applicable
All Theory cum studio based courses	3 hrs	50	50	100	Applicable
All studio based courses (except Architectural Design Exam and NCC/NSS/NSO/Yoga)	Not Applicable	50	50	100	Applicable
studio based courses (Architectural Design Exam)	6 – 18 hrs	-	100	100	Not Applicable
studio based courses (NCC/NSS/NSO/Yoga)	Not Applicable	100	-	100	Applicable
Professional Training	Not Applicable	100	-	100	Not Applicable
Documentation	Not Applicable	-	100	100	Not Applicable
Thesis	Not Applicable	50	50	100	Not Applicable

QUESTION PAPER PATTERN (END SEMESTER EXAMINATION)

1. All Theory Courses	-	Part- A (10X2= 20 MARKS) Answer all questions
	-	Part- B (5X16=80 MARKS)
	-	(Either or type)
2. All Theory cum studio based courses	-	Part- A (5X4= 20 MARKS) Answer all questions
	-	Part- B (4X20=80 MARKS)
	-	(Either or type)

(Since they are a mix of drawing and theory content, all Part-A questions relate to theory and all Part–B questions are drawing based. It is not possible for a candidate to answer more than 4 drawing questions in three hour duration)

3. Studio based courses (Architectural Design Exam)	-	1x100=100 Marks (Either or type)

B.ARCH SYLLABUS – 2011

Course structure:

Architectural Design is the most important subject in the B.Arch curriculum, where students are involved in studio work to design all types of buildings. Hence all the semesters have this subject as the prime component, with the theory subjects intended as an input to Architectural Design Studio. After completion of the program students are employed by various architectural practices based on their Design portfolio, in which the students' design projects are highlighted.

General procedure for Architectural Design Studio:

The approach to the design solutions start with study of anthropometrics and space standards related to each problem, doing case studies and book studies of similar typology of buildings and presenting the data as a study report in a class seminar. Various methods of spatial analysis such as the Bubble diagram based on activities, Proximity matrix and Circulation diagrams & Site analysis are essential to formulate conceptual ideas. The transformation of the concept to a pragmatic design solution will largely depend on the exploration of various geometrical alternatives and a study of their feasibility. The design solution for each problem will be presented through conceptual sketches, presentation drawings and models.

General procedure for Building materials & Construction, interior design & other theory cum studio subjects:

Each session comprises of 4 hrs duration, of which the first 1/2 hours will be dedicated to lectures where the theoretical aspects are discussed. The remaining hours will be drawing classes where the students are expected to do the detail drawings for building construction or interior design. The drawing plates done by the students have to be submitted for scrutiny & correction, latest by the afternoon of the following day.

All Building materials & construction courses have been structured so that the students get to know the construction methods & techniques in the earlier semester for the Design projects that they would be doing in the

following semester. Moreover, these sessions will be augmented by undertaking visits to construction sites whenever required, which will help the student to get firsthand knowledge about materials & construction.

SYLLABUS 2011

I SEMESTER

		L	T	P	C
MA0121	**MATHEMATICS FOR ARCHITECTS**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

The course is aimed at developing basic Mathematical skills for Architecture students to understand structural concepts complex form and geometry.

INSTRUCTIONAL OBJECTIVES

To inculcate understanding of the application of matrices, differential calculus, integration & analytical geometry in the study of architecture.

UNIT-1 MATRICES **6**

Review Topics: Types of matrices, operation in matrices, Determinants, properties.

Rank of Matrix: Elementary Transforms – Inverse of a matrix by gauss – Jordan method linear independence – consistency of system of equations – Rouche's Theorem (statement only) characteristic equation – Eigen values, Eigen vectors – clayey Hamilton Theorem (statement only)

UNIT 2 DIFFERENTIAL CALCULUS & APPLICATIONS **6**

Review Topics: Limit, continuity concepts – methods of differentiation. **Calculus of one variable**: Curvature – Radius of curvature – Cartesian & polar equation (simple problems) - centre & circle of curvature. **Calculus of two variables**: Partial differentiation – Homogeneous functions Euler's Theorem – Errors and approximations – Maxima and Minima – saddle point Lagrange's multiplier method (simple application problems)

UNIT 3 NUMERICAL INTEGRATION **6**

Numerical integration: Trapezoidal rule – Simpson's 1/3 rule & 3/8 rule – Weddle's rule – Error formula – order of error.

UNIT 4 ANALYTICAL GEOMETRY (3DIMENSIONAL) **6**

Introduction: Direction cosines, Direction rations – Angle between lines **Plane:** Equations of plane – Angle between planes – Distance between parallel planes. **St. Line**: Equations of straight line – plane and straight line – coplanar lines - shortest distance between skew lines.

UNIT 5 APPLICATIONS OF INTEGRATION **6**

Review: Techniques of integration: Curve tracing – plane curves – Cartesian & polar form – procedure for curve tracing in parametric form. Area bounded by curve – Arc length of curve – volume & surface Area of solids of revolution. Introduction to sphere, cone, cylinder quadratic surface & solids of revolutions.

TOTAL 30

TEXT BOOKS

1. Grewal B.S*., Higher Engineering Mathematics*, 35th edition, Khanna Publishers, 2000.
2. Dechiara &callender, *Time saver standards for Architectural design data.*

REFERENCE BOOKS

1. Veerarajan.T. *Theory and problems in Numerical Me*thods , Tata McGraw Hill Publishing Co., New Delhi, 2004.
2. Veerarajan T., *Engineering Mathematics*, Tata McGraw Hill Publishing Co., New Delhi, 2000.
3. Kandasamy P etal. *Engineering Mathematics, Vol. I* (4th revised edition), S.Chand & Co., New Delhi, 2000.
4. Venkataraman M.K., *Engineering Mathematics* – First Year (2nd edition), National Publishing Co., Chennai, 2000.
5. Narayanan S., Manicavasagam Pillay T.K., Ramanaiah G., *Advanced Mathematics for Engineering* students, Volume I (2nd edition), S.Viswanathan Printers and Publishers, 1992.
6. Ramamurthy V, etal *Engineering Mathematics Vol. I and II*, Anuradha Publications.
7. A.Singaravelu, *Numerical methods* –Meenakshi Agency, Chennai -2004.

		L	T	P	C
LE 0101	**ENGLISH**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To impart excellent training in English to meet the demand in the field of global communication with a view to enable the students to acquire placement anywhere in the world with ease and confidence.

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Unit – I 12

Listening & Speaking	Peer Introduction Communication, LSRW Role Play
Reading:	Reading Comprehension, Skimming, Scanning and close Reading
Writing:	Definitions, Transcoding - Bar & Flow chart, Letter writing 1. Permission for IV (Industrial Visit) 2. Identification of Social Problem& Solutions
Grammar:	Prefixes, Suffixes, Synonyms, Connectives, Active & Passive voice, Degrees of Comparison

Unit – 2 12

Listening & Speaking:	News – Note making & Presentation
Writing:	Essay, Mini Project Proposal, Instructions, Notice, Minutes and Agenda
Grammar:	Concord, Conditionals

Unit – 3 5

Writing:	Job Application and Resume
Speaking and Writing	Product Description
Grammar	Tenses and Prepositions

Unit – 4 6

Reading :	Reading Comprehension
Writing :	Cheklist, Report writing, Note making
Vocabulary:	Amercian and British English

Unit – 5 10

Speaking & Writing	Project Presentation Error detection

Total 45

Text Book.

An English Course Book - Dr.K.Anbazhagan .et.al., Department of English and Foreign Languages, SRM University. SRM Publications, Chennai.

Reference Book.

Technical Communication-Principles and Practice; Meenakshi Raman and Sangeetha Sharama - Oxford University.

		L	T	P	C
ARC 101	**THEORY OF ARCHITECTURE**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

To provide the student of architecture a foundation in the conception of forms, spatial aspects, compositions and their analysis in buildings

INSTRUCTIONAL OBJECTIVES

To develop understanding of the basic principles of space and mass, circulation and architectural composition.

UNIT-1 ARCHITECTURAL SPACE AND MASS **15**

Definition of architecture- **elements of architecture** - Space defining elements , openings in space defining elements, spatial relationship, spatial organization

Primary forms, properties of form, transformation of forms - dimensional transformation, subtractive, additive forms, organization of additive forms - Articulation of forms

UNIT-2 AESTHETIC COMPONENTS OF DESIGN **10**

Exploration of the **basic principles of design** such as Proportion, scale, balance, rhythm, symmetry, hierarchy, axis with building examples.

UNIT-3 CIRCULATION **5**

Components of building circulation - The building approach, The building entrance, Configuration of path, Path space relationship, Form of circulation space -Circulation diagram for residence and restaurant

UNIT-4 PRINCIPLES OF COMPOSITION **5**

Involves the study of the basic principles that govern an **architectural composition** such as Unity, Harmony, Dominance, Fluidity, Emphasis, Contrast etc.

UNIT-5 DESIGN PROCESS AND ANALYSIS OF BUILDING **10**

Design process –integration of aesthetics and function - Understanding of formative ideas, organization concepts, spatial characteristics, - Massing and circulation in design analysis of the following buildings: Falling water house,& Guggenheim museum by F. L. Wright -Villa Savoye & Chapel of Notredame DuHaut by Le corbusier.

TOTAL 45

TEXT BOOKS

1. Francis D. K. Ching, *Architecture - Form, Space and Order*, Van Nostrand Reinhold Company , 1979
2. Roger H. Clark, Michael Pause, *Precedents In Architecture*, Van Nostrand Reinhold Company , 1996

REFERENCE BOOKS

1. K.W.Smithies, *Principles of Design in Architecture*, Van Nostrand Reinhold Company , 1981
2. Sam F. Miller, *Design Process - A Primer For Architectural & Interior Design,* Van Nostrand Reinhold Company , 1995
3. Ernest Burden, *Elements of Architectural Design* – A Visual Resource, Van Nostrand Reinhold Company , 1994

4. V.S.Pramar, *Design Fundamentals in Architecture*, Somaiya Publications, New Delhi, 1973

		L	T	P	C
ARC 103	**ART APPRECIATION**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

AIM:

The objective of the course is to understand and appreciate art in terms of its form, content and context through the study of works of art over history in order to develop a sensitivity towards aesthetics which is a necessary component of architecture.

OBJECTIVES:

- To introduce the vocabulary of art and the principles.
- To inform students about the various art forms through the ages within the cultural contexts.
- To study Modern Art and the new directions that evolved in the 19th and 20th centuries.
- To inform the production of art in the Indian context through history and the contemporary manifestations.

UNIT-1 INTRODUCTION TO ART **6**

Definition of art - need for art – role of art – art reality, perception, representation categories of art in terms of media and technique - appreciating art: form, content and context

UNIT-2 VOCABULARY OF ART **9**

Introducing the vocabulary of art constituted by elements (line, shape, form, space, colour, light, value, texture) and principles (unity, variety, harmony, rhythm, balance, proportion, emphasis, contrast, movement)

UNIT-3 BEGINNINGS TO NEOCLASSICISM **10**

Appreciating art through the study of art production in the West from the beginnings to the birth of modern art. Important works from the following art traditions will be studied and analysed in terms of their form, content and context Prehistoric Art - Egyptian and Mesopotamian art Greek and Roman art– Medieval art - Renaissance and Baroque art - Neoclassicism - Romanticism – Realism

UNIT-4 MODERN ART AND AFTER **10**

Appreciating art through the study of art production in the West over history from modern art till the present. Important works from the following art traditions will be studied and analysed in terms of their form, content and context : Context for new directions in art in the late 19th and early 20th century - Impressionism - post Impressionism – Fauvism- Expressionism- Cubism – Dadaism – Surrealism - abstract art – Futurism - Constructivism – Suprematism –- De Stijl - Abstract Expressionism - Pop art -Op art- new forms and media of art

UNIT-5 INDIAN ART **10**

Appreciating art through the study of art production in India over history. Important works from the following art traditions will be studied and analysed in terms of their form, content and context
Indus Valley Art - Hindu Buddhist and Jain art - Mughal and Rajput miniatures - art during the colonial period - modern Indian Art.

TOTAL: 45

REQUIRED READING

1. Fred, S. Kleiner, Gardener's Art through Ages, Harcourt College Publishers, 2001
2. Bernard S. Myers, Understanding the Arts, Holt,Rinehart and Winston Inc, 1964
3. Edith Thomory- a History of Fine Arts in India and the West, Orient Longman

Publisher's Pvt. Ltd, New Delhi
4. H.H. Arnason, History of Modern Art, Thames and Hudson, 1977

REFERENCES:

1. The Penguin Dictionary of Art and Artists - Peter and Linda Murray - Penguin books 1989.
2. E.H. Gombrich, The Story of Art, Phaidon 2002
3. E.H.Gombrich, Art and Illsuion, Phaidon, 2002
4. Indian Art since the early 1940s- A Search for Identity- Artsists Handicrafts
Association of Cholamandal Artists Village, Madras,1974
5. A.K.Coomaraswamy, Fundamentals of Indian Art, Historical Research Documentation

		L	T	P	C
ARC 105	**BUILDING MATERIALS & CONSTRUCTION –I**	**1**	**0**	**3**	**3**
	Prerequisite				
	Nil				

PURPOSE

The course in Building Construction is visualized as having two essential components:

1. A lecture course on Building materials and principles of construction
2. A "Construction Studio" where these principles will be applied to construction problems and architectural detailing.

INSTRUCTIONAL OBJECTIVES

Understanding the basic components of a building with its construction details such as Foundation Footing (stone, brick & RCC), Wall section (plinth, floor, sill, lentil, roof & parapet), Roofs (flat, sloped, Pyramid & dome), Fenestration (Different types of doors, windows & ventilators) and Interior details (wardrobe, kitchen cabinet, TV shelf& show case).

UNIT-1 STONES **4**

Geological **Classification** of rocks – test for stones, uses of stones, deterioration of stone, preservation of stones, stones available for construction in India their **properties and uses**. Stones for finishes – cutting & polishing – granite and marble. Artificial stone and their uses.

UNIT-2 BRICKS & CLAY PRODUCTS **5**

Bricks: Composition of good brick, properties and uses of bricks, classification of bricks, shape of bricks, fire bricks, and substitutes for bricks **Clay products:** Tiles, terra cotta, stoneware, earthenware, porcelain, and clay blocks their properties and uses.

UNIT-3BASIC BUILDING COMPONENTS, FOUNDATION, WALLS& ROOFS **21**

Basic building components: Cross section of a small building to understand foundation, plinth beam flooring, sill, lintel, roof beam and slabs parapet & weathering course **Foundation:** typical types of foundation in stone, brick & RCC. **Walls**: Details of walls section across the opening (door & window) **Roofs:** simple configurations and details of various forms of roofs (flat, slope pyramidical & dome)

UNIT-4 DOORS, WINDOW & VENTILATOR **18**

Doors: Braced, panel flush doors, carved entrance doors and partially glazed doors. **Windows:** casement window (without mullion), bay window, & French window. **Ventilator:** louvered & top hung ventilator.

UNIT-5 FURNITURE & FITMENTS **12**

Showcase & shelf: TV shelf, showcase & room divided, dressing ward robe**. Cupboard &Cabinets:** .kitchen cupboard & wall cabinets.

TOTAL: 60

TEXT BOOKS

1. W.B. Mickay – *Building construction Vol 1 and 3* – Longmans, UK 1981
2. S.C.Rangwals – *Engineering materials* – Charotar Publishing, Anand.

REFERENCE BOOKS

1. Harold B.Olin – *Construction principles, Materials and Methods* – IFE, Chicago, 1980.
2. Dr. B.C Punmia – *Building construction*
3. R.Chudley, *construction Technology*.

		L	T	P	C
ARC 107	**ARCHITECTURAL GRAPHICS –I**	**1**	**0**	**3**	**3**
	Prerequisite				
	Nil				

PURPOSE

To train the students in the fundamental techniques of Architectural Drawing and Free Hand Drawing.

INSTRUCTIONAL OBJECTIVES

The students will develop knowledge of orthographic projections , measured drawing and skill in Free Hand sketching.

UNIT-1 INTRODUCTION **5**

Introduction to the **basic principles of drawing** - scale conversion etc. – Practices in lettering.

UNIT-2 GEOMETRICAL DRAWING **15**

- **Introduction to Plane geometry** – Exercise in construction of Straight lines, Circles, Tangents and Regular polygons.
- **Description of Plane Curves :** Ellipse, Parabola and Hyperbola.
- **Solid Geometry** : Simple Projections – Projection of solids – Developments

UNIT-3 ISOMETRIC & AXONOMETRIC **10**

- **Isometric Vi**ew : Isometric Views of Objects, building components such as Steps, Canopy etc.
- **Axonometric view** : Axonometric view of objects , interior view of rooms etc.

UNIT-4 MEASURED DRAWING **15**

- Understanding of different scales and their uses in practice - Drawings to scale. Examples of **Measured drawing** - Furniture, Class room plan, Doors, Windows, Entrance Gate, building etc.

UNIT-5 SKETCHING **15**

- **Indoor objects** - still Life – Furniture, Equipment - Under standing Depth, light, Shade , Shadow Etc.,
- **Outdoor sketching**: Natural Forms/ Built Forms, Under standing variety in Forms.
- **Sketching Human Form**: Anatomy and Expressions - Graphical Representations.

TOTAL: 60

TEXT BOOK

1. M.S.Kumar, *Engineering Drawing,* DD publications, Chennai 600 048
2. Francis D.K.Ching &Steven P Juroszek, *Design drawing*, John Wiley & Sons, USA, 1998

REFERENCE BOOKS

1. I.H. Morris, *Geometrical Drawing for Art Students*, Orient Longman Chennai.
2. N.D. Bhatt – *Engineering Drawing* Charotar Publishing House, Anand, India.
3. *Drawing and Painting Architecture* by Rayeuans Pub. Van Nostrand Reinhold Company, New York

		L	T	P	C
ARC 109	**BASIC DESIGN & VISUAL ARTS**	**0**	**0**	**12**	**6**
	Prerequisite				
	Nil				

PURPOSE

To impart a good foundation in design through hands-on experience in designing simple two dimensional and three dimensional compositions.

INSTRUCTIONAL OBJECTIVES

- Introduction to design- problem-solving, elements of design, principles of design, 2-D designs in different mediums, colours and textures for articulation of abstract ideas.
- Development of student's vision regarding 3-D forms (models and sculptures) in different materials, colours, and textures for specific themes/expressions to develop creative/imaginative thinking.

UNIT-1 SHAPE, COLOR AND TEXTURE **36**

An introduction to various **design elements** such as line, shape , mass ,colour etc including the theoretical aspects such as properties of line compositions, family of shapes, percepts, analysis of forms and colour theory - making two dimensional and three dimensional compositions involving various elements of design such as Line, Shape, Color, Texture, Transparency, Mass, space etc., aimed at understanding the principles of design such as Repetition, Harmony, Contrast, Dominance, Balance, Dynamism, etc.,

UNIT-2 THREE DIMENSIONAL SCULPTURES **36**

Making three dimensional **sculptures** involving the basic platonic solids and abstract sculptures using various techniques/ materials such as POP, wire/ matchstick, soap, clay etc., involving the principles of art.

UNIT-3 COMPOSITION **36**

Compositions involving the progression of two-dimensional shapes into three-dimensional forms. Composition of three dimensional units using modular components with exercises in balance, Rhythm , contrast, transition and continuity.

UNIT-4 FORMS IN NATURE **36**

Study of harmonious forms in **nature** and analysis with respect to their colour, form, texture and structure. Exercises involving these natural forms and various approaches to art such as – Representation, Abstraction, and Non-Representational/ Non-Objective compositions.

UNIT-5 ANALYSIS OF SIMPLE OBJECTS **36**

Critical analysis of simple man-made objects to understand the underlying concepts in their design. Studies to understand function - Aesthetic Relationship, and Anthropometrics.

TOTAL 180

TEXT BOOK

1. Charles Wallschlaeger & Synthia Busic Snyder, *Basic Visual Concepts & Principles for artists, architects & de*signers, McGraw hill, USA, 1992.

REFERENCE BOOKS

1. Paul Zelanski & Mary Pat Fisher, *Design principles & Problems* , 2nd Ed, Thomson & Wadsworth, USA,1996

2. Owen Cappleman & Michael Jack Kordan, *Foundations in Architecture*: *An Annotated Anthology of beginning design projects*, Van Nostrand Reinhold, New York.
3. Trewin Copplestone, *Arts in Society*, Prentice Hall Inc, Englewoods Cliffs, N. J. 1983.
4. H. Gardner, *Art through ages*.
5. Paul Laseau, *Graphic Thinking For Architects and Designers*, John Wiley & Sons, New York, 2001.

		L	T	P	C
GE0107	**NCC/NSS/NSO/YOGA**	**0**	**0**	**2**	**1**
	Prerequisite				
	Nil				

II SEMESTER

		L	T	P	C
ARC 102	**STRUCTURAL CONCEPTS IN ARCHITECTURE**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

- To enable students to understand the concepts of structures in architecture.
- To enable the students to understand the different structural materials used for various buildings.

INSTRUCTIONAL OBJECTIVE

By the end of the course the students shall be confident about the structural action of the various elements. Further he will have sufficient knowledge about the various long span structures.

UNIT-1 LOADS ON STRUCTURE **9**

Loads – Static Loads – Dynamic Loads – Fire Loads – Effect of Temperature and Settlement.

UNIT-2 STRUCTURAL MATERIALS **9**

Properties of Structural Materials – Advantages and Disadvantages of Structural Materials – Choice of Structural Material for Domestic Buildings, Industrial Buildings, Tall Buildings and Long Span Buildings

UNIT-3 PROBLEM OF SPAN **9**

History of Spanning – Concept of Moment – Composition and Resolution of Forces – Theory of **Bending Moments and Shear Force (Problems).**

UNIT-4 TENSION AND COMPRESSION MEMBERS **9**

Concepts of various structural systems – Cables – Trusses – Arches – Cable Roofs – Space Frames – Flat Slabs.

UNIT-5 CURVED STRUCTURES AND LONG SPAN BUILDINGS **9**

Theory of **Vaults and Domes** – Construction of Masonry Vaults and Domes – Concepts of Reinforced Concrete Shells, Domes and Vaults – Folded Plate Roofs – tensile structures.

TOTAL 45

TEXT BOOKS

1. Henry.J.Cowan, Forrest Wilson, *Structural Systems*, Van Nostrand Reinhold Company, New York,

REFERENCE BOOKS

1. Mario Salvadori, Robert Heller, *Structure in Architecture*, Prentice International Series in Architecture, New Jersey, 1963.

		L	T	P	C
ARC 104	**HISTORY OF INDIAN ARCHITECTURE**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

To impart knowledge about Indian culture, building art and vernacular construction techniques that would influence the architecture student to develop designs that are rooted in this country and suitable to the lifestyle of its people.

INSTRUCTIONAL OBJECTIVES

The course aims to develop an appreciation of our varied culture and the resulting architectural productions which are unique in time and place. Development of the ability to sketch Plans, sections, elevations and architectural details is also intended.

UNIT-1 BUDDHIST ARCHITECTURE & EVOLUTION OF THE HINDU TEMPLE **8**

Ashokan school of architecture - Examples - Ashokan Pillar at Sarnath and Sanchi stupa. Buddhist rock cut architecture - Salient features of a Chaitya hall and Vihara - Examples - Chaitya hall at Karli, Vihara at Nasik. Evolution of Hindu Temple - Early shrines of the Gupta and Chalukyan periods - Tigawa temple and Ladh Khan temple - Development of the Indo-Aryan & Dravidian style - Examples - Papanatha and Virupaksha temple at Pattadakal

UNIT-2 DRAVIDIAN STYLE TEMPLES **10**

Dravidian style - Rock cut architecture of Pallavas - Mandapas & Rathas - Masonry temples - Shore temple at Mahabalipuram and Kailasanathar temple at Kanchipuram - Dravidian Orders - Example of Chola style - Brihadeeswara temple at Tanjore - Evolution of Gopuram & temple complexes – Example of Pandyan style - Meenakshi Amman temple, Madurai.

UNIT-3 INDO-ARYAN STYLE OF TEMPLES **8**

Salient features of an Indo Aryan Temple - Examples at Orissa - Lingaraja temple at Bhuvaneshwar & Sun temple at Konarak - Example in central India - Khandarya Mahadev temple at Khajuraho - Example in Gujarat - Surya Temple at Modhera.

UNIT-4 ISLAMIC ARCHITECTURE – IMPERIAL & PROVINCIAL STYLES **10**

Influences - the Islamic Arch - Features of an Indian mosque - The Imperial style of Slave dynasty kings - Examples - Qutb Complex at Delhi - Varieties of squinch - Alai Darwaza - Tomb of Ghiasuddin Tughlaq, Lodi garden at Delhi.

Development of the provincial styles in different regions - Punjab style - Tomb of shah Rukni Alam - Bengal style - Chota sona masjid at Gaur - Gujarat style - Jami masjid at Ahmadabad - Deccan style – Golgumbaz at Bijapur and Charminar at Hyderabad.

UNIT-5 MUGHAL ARCHITECTURE **9**

Development of the Mughal style under different rulers - Babur, Humayun, Akbar, Jahangir, Shahjahan and Aurangzeb - Examples - Humayuns Tomb at Delhi, Fatehpur Sikhri (lay out, Buland darwaza, Diwani Khas, Tomb of Salim Chisti) Akbars Tomb at Sikandara - The Taj Mahal, at Agra - Red Fort at Delhi (Diwan-i- Aam, Diwani khas, Mumtaz mahal and Rang mahal).

TOTAL 45

TEXT BOOKS

1. Percy Brown, Indian Architecture (Islamic Period) - Taraporevala and Sons, Bombay, 1983

2. Satish Grover, The Architecture of India (Buddhist and Hindu period*)*, Vikas Publishing House, New Delhi, 1981
3. Satish Grover, The Architecture of India (Islamic*)* Vikas Publishing House Pvt. Ltd., New Delhi, 1981.

REFERENCE BOOKS Christopher Tadgell, The History of Architecture in India, Longman Group, U.K. Ltd., London, 1990

1. A.Volwahsen, Living Architecture - India (Buddhist and Hindu), Oxford and IBM, London, 1969.
2. George Mitchell, Monuments of India, Vol I, Buddhist, Jain, Hindu; Penguin books, 1990
3. Gateway to Indian Architecture, Guruswamy Vaidyanathan, Edifice Publication, 2003
4. Architecture of the Islamic World - George Michell - (its history and social meaning), Thames and Hudson, London, 1978.
5. Islamic Architecture, Form, Function and Meaning, Robert Hillenbrand, Edinburgh University Press, 1994

		L	T	P	C
ARC 106	**CULTURE AND ARCHITECTURE**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

To establish the linkages between the culture of a particular race of people and its manifestation in the architecture of that region.

INSTRUCTIONAL OBJECTIVES

Students of architecture have to be sensitized to various cultural aspects such as fine arts and the performing arts of a particular country and have to understand the symbolism, patterns and forms that manifest themselves in the architecture of that place.

UNIT-1 CULTURAL INFLUENCES IN ANCIENT INDIA 9

Indus valley civilization – Town planning in Mohen jo daro –Tree & mother goddess worship – Harappa and lothal –the great bath, the great granary – sumps, manholes, underground drainage etc.
Symbolism in early Buddhist architecture in India – Stupas at Sanchi and Amaravati – Greek influence in Buddhist architecture – Takht i Bahai. – symbolism in Chaitya halls and Viharas of rock cut buddhist architecture. – symbolism in Tibetan Buddhism – manifestation in the architecture of monasteries (gompa) and palaces – Potala palace, Palpung monastery.

UNIT-2 ARCHITECTURE & CULTURE IN CHINA & CAMBODIA 9

Confucianism, Taoism and Buddhism – ancient Chinese wooden architecture –Concepts of Bilateral symmetry, Enclosure, Hierarchy, Horizontal Emphasis, Cosmology etc. – architectural types – Religious architecture – Pagoda of Fogong, Temple of Heaven pagoda – Basic concepts of feng shui and its applicability to interior design – Cambodia – Khmer belief – Hinduism & Buddhism – Temples at Angkor Wat and Bayon – Khmer house Traditional Japanese house – floor plan

UNIT-3 APANESE TRADITIONAL ARCHITECTURE & CONTEMPORARY EXPRESSIONS 9

Elements of a traditional Japanese house and garden – Machiya, Genkan, tatami. Flexible space modules, fusuma, shoji, roof made of wood , clay, thatch and tiles – House & garden – dry landscape gardens, Tsukiyama (landscape) gardens, Chaniwa (tea) gardens etc – Architectural evolution during the Nara, Samurai & later Meiji period - Contemporary expressions – Imperial hotel, Tokyo by F.L.Wright, National Gymnasium, Tokyo by Kenzo Tange – Works of Fumihiko Maki, Arata Isozaki and Tado Ando (Awaji).

UNIT-4 TRADITIONAL ART &ARCHITECTURE OF TAMILNADU 9

Structure of a south Indian temple – six divisions in elevation – temple layout illustrating human form delineation of the temple elevation parts in analogy to the human body – Srirangam temple, Gangaikonda cholapuram temple – Salient features of a Chettinad house – traditions in arts & crafts – space, function and climate responsiveness – columns, parapets and cornices – Rajas' palace in kanadukathan –Nagarathar houses in karaikudi.

UNIT-5 TRADITIONAL ART & ARCHITECTURE OF KERALA 9

Salient features of the Thravadu house – Nallukettu, Ettukettu etc. – Thatchu sastra or the science of carpentry – roof wood frame details – Padmanabhapuram palace, Museum building, Trivandrum -Contemporary expressions

– Center for development studies by Laurie Baker – projects by Costford – Ashtamudi resort hotel, IIM Kozhikode etc.

TOTAL 45

REFERENCE BOOK

1. A.Thampuram "Study of Architecture Forms in Malabar coast" Wiley and sons Inc
2. George Mitchell - Temple towns of Tamilnadu- Marg publications Bombay 1993
3. Lawrence G.Lin – Chinese Architecture – Academy Edition. London 1989
4. Rayrewal, etal – Architecture in India – Ministere des relations exteriieres , frances

		L	T	P	C
LE0105	**COMMUNICATION SKILLS IN ENGLISH**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To provide an adequate mastery of technical and communicative English Language training primarily, reading and writing skills, secondarily listening and speaking skills.

INSTRUCTIONAL OBJECTIVES

To prepare them for participation in seminars, group discussions, paper presentation and general personal interaction at the professional level.

UNIT-1 COMMUNICATION 4

Important of Communication – Elements of good individual communication – organizing oneself – different types of communication**.**

UNIT-2 ORAL COMMUNICATION AND GROUP COMMUNICATION 6

Features of an effective speech- practice in speaking fluently – role play – telephone skills – etiquette.

UNIT-3 PUBLIC SPEECH 4

Short Extempore speeches – facing audience – paper presentation – getting over nervousness – Interview techniques – preparing for interviews – Mock Interview – Body Language.

UNIT-4 CREATIVE WRITING 8

I. a. Scope of creative writing
   b. Writing a report/ format of the report
   c. Oral Report
   d. Periodical Report
   e. Progress Report
   f. Field Report

II Product description – Description of devices & Mechanism

UNIT-5 COMMUNICATION & COMPUNICATION 8

Preparation of minutes – Video conference – Tele conference / Virtual meeting

Impact of internet on communication – communicate through computers – voice mail – broadcast messages – Internet Relay chat – e-mail auto – response – FTP etc.

TOTAL 30

TEXT BOOKS

1. Abraham Benjamin Samuel `*Practical Communication' (Communicative English*) ,SRMEC, June 2002 Edition.

REFERENCE BOOKS

1. Eric H.Glendinning & Beverly Holmstrom, "*Study reading – A course in reading skills for academic purpose*", Cambridge University Press, 1992.
2. John Kirkman, "*Good style – writing for science and technology"*, E&FN Spon, an Imprint of Chapman & Hall, 1992.
3. Sharon Bower, "*Painless public speaking*", Thorsons publishers Ltd., 1982.
4. Stewart, Zimmer & Camp. *"College English and Communication*", McGraw Hill, 1987.
5. Alan Maley and Sandra Moulding, *"Learning to listen – tasks for developing listening Skills",Cambridge* University Press, 1981.

		L	T	P	C
ARC 108	**BUILDING MATERIALS & CONSTRUCTION -II**	**1**	**0**	**3**	**3**
	Prerequisite				
	Nil				

PURPOSE

This course is a combination of lecture & studio classes aimed at developing the students understanding of material properties and vernacular construction techniques.

INSTRUCTIONAL OBJECTIVES

To expose the students to different materials of construction, progressively and to enable them to represent the different building components through relevant drawings**.**

UNIT-1 LIME, SAND AND MORTAR **3**

Lime: Basic definitions types of binding sources of lime classification of lime properties and uses of various types of limes. **Sand:** sources of sand, classification of sand, bulking of sand, test for sand, properties of sand and substitute of sand. **Mortar:** Classification of mortar, various types of mortar (lime, surkhi, cement and gauged) uses of mortar, properties of good mortar, preparation of mortar, selection of mortar**.**

UNIT-2 RURAL AND TRATIONAL MATERIALS **5**

Mud: Mud as a building material – **Soil stabilization**: Need for soil stabilization – Stabilized soil blocks – **Rural materials:** Bamboo, Casuarina, Coconut, palm, hay, coir – properties & uses – Fire retardant treatment & Insect Proofing.

UNIT-3 BRICK MASONRY **22**

Brick masonry: types of bonding ,English Flemish & rat trap bond for single one and half thick wall for corners and T- Junctions. **Garden wall bonding:** honey comb, raked and herring bone bond. **Ornamental bonding:** brick jallis, ornamental brick panels and brick pavements. **Arches:** arches in brick and stone (flat, segmental, semi circular and pointed)

UNIT-4 ROOFS IN TRADITIONAL MATERIAL **16**

Roof: Details of pitched roof and hipped roof with pan tiles and Mangalore tiles. Details of madras terrace roof for small and medium span.

UNIT-5 STRUCTURES USING RURAL MATERIALS **14**

Foundation and walls: foundation and wall in stone masonry (Random rubble, SR & Ashlar) foundation and walls in stabilized mud and Compact earth blocks**. Walls:** various types of details for walls with bamboo and casuarinas **Roofs in rural materials:** Details of thatched roof with casuarinas/ bamboo / CEB frame work. Details of palm and hay roof with casuarinas / bamboo/ CEB.

TOTAL: 60

TEXT BOOKS

1. W.B. Mickay – *Building construction Vol 1,2 and 3* – Longmans, UK 1981.

2. R.Chudley – *Building Construction Handbook* – BLPD, London 1990.
3. S.C.Rangwals – *Engineering materials* – Charotar Publishing, Anand.

REFERENCE BOOKS

1 *Use of Bamboo and a Reed in Construction* – UNO Publications
2. A.Agarwal –Mud: *The potentials of earth based material for third world housing – IIED*, London 1981.
3. *HUDCO* – All you wanted to knos about soil stabilized mud blocks, New delhi, 1989.
4. Dr.B.C.Punmia – *Building construction*
5. R.Chudley, *construction Technology*.
6. Francies D.K.Ching – *Building Construction illustrated*. VNR, 1975.

		L	T	P	C
ARC 110	**ARCHITECTURAL DELINEATION AND MODEL MAKING**	**0**	**0**	**3**	**2**
	Prerequisite				
	Nil				

PURPOSE:

To introduce the students to basics of rendering , presentation skills &model making with various materials

UNIT-1 DIAGRAMMING **5**

Types of **diagrams** – graphic metaphors, are diagram, matrix diagram, network diagram, bubble diagram, circulation diagram, analytical diagram, schematic etc. – symbol, sign, arrows, parti – concept diagrams

UNIT-2 PRESENTATION TECHNIQUES **15**

Techniques of rendering with pen &ink- graphical representation of buildings & entourage such as Trees, Lawns, Shrubs, Paving, Pathways, Flower Bed, Water Pools, Human Figures, Vehicles etc. Exposure to other medium of presentation **-** Pencil, Pastel Colors, and water Colors, Color Theory and Use of Colors in Presentation.

UNIT-3 INTRODUCTION TO MODEL MAKING AND BLOCK MODELLING **10**

- Introduction to concepts of model making and various materials used for model making
- Preparation of base for models using wood or boards
- Introduction to block models of buildings (or 3D Compositions) involving the usage of various materials like Thermocole, Soap/Wax, Boards, Clay etc.

UNIT-4 DETAILED MODELLING **10**

- Making detailed models which includes the representation of various building elements like Walls, Columns, Steps, Windows/glazing, Sunshades, Handrails using materials like Mountboard, Snow-white board, acrylic sheets.
- Representing various surface finishes like brick/stone representation, stucco finish etc.
- Various site elements – Contour representation, Roads/Pavements, Trees/Shrubs, Lawn, Water bodies, Street furniture, Fencing etc.

UNIT-5 MODELS OF STRUCTURAL SYSTEMS **5**

Making models of the various structural systems used in buildings like

- Space frames – using Match sticks, wires
- Different forms of shell roofs using POP, Clay, Soap
- Tensile structures using fabric.

TOTAL 45

REFERENCE:

1. BENN, the book of the house , Errnest Benn limited London

2. Jannsen, Constructional Drawings & Architectural models, Kari Kramer Verlag Stuttgart, 1973.
3. Harry W.Smith, The art of making furniture in miniature, E.P.Duttor Inc., New York, 1982.
4. Thames and Hudson Manual of Rendering with Pen and Ink-Robert W Gill.

		L	T	P	C
ARC 112	**ARCHITECTURAL GRAPHICS II**	**1**	**0**	**3**	**3**
	Prerequisite				
	Nil				

PURPOSE

Students should acquire knowledge of the various drawings which effectively communicate their ideas as designers.

INSTRUCTIONAL OBJECTIVES

To train the Students in the field of Perspective Drawing and Sciography, Representation skills, geometrical drawing of special curves.

UNIT-1 PLANS & SECTIONS OF BUILDINGS **12**

Floor **plans**, elements above & below plan cut, reflected ceiling plan, site plan with contours, site sections, building **elevations**, building **sections**, multiple sections, cut away plans & sections of buildings

UNIT-2 PERSPECTIVE **16**

Principles of perspective and visual effects of three dimensional objects, study of picture plane, Station point, vanishing Point, Eyelevel, Ground level, etc. - its variations and Effects. Principles of Drawing One point, Two point perspectives & 3 point perspectives -Perspective Drawing of Three Dimensional Objects, Interiors and Exteriors of Building. – sectional perspectives.

UNIT-3 SCIOGRAPHY **12**

Principles of Shade and Shadows - shadows of lines and Circles - Shadows of Architectural Elements - Shadows of Circular Solids - Shadows of Buildings - reflections

UNIT-4 GEOMETRICAL DRAWING OF SPECIAL CURVES **10**

Curves formed by the intersection of a plane with a right circular cone – Ellipse, Parabola, Hyperbola and Cantenary – Geometrical construction of Sine curve,Geometrical mean,Golden Section,Archimedian Spiral, Logarithmic Spiral.

UNIT-5 COMPLEX CURVES AND SURFACES **10**

Geometrical construction of Hyperbolic paraboloid, Ellipsoid, Ellipictic Paraboloid, Hyperboloid – Hypers, Geodesic Domes etc.

TOTAL 60

TEXT BOOK

1. *Perspective & Sciography* by Shankar Mulik Allied Publishers
2. Francis DK ching, *Design drawing*, John wiley & sons, usa, 1998.

REFERENCE BOOKS

1. M.G. Shah & K.M. Kale, *Perspective Principles* of Asia publication Mumbai.
2. *Architectural Rendering*. The Techniques of Contemporary Presentation. By Albert O'Halse Pub. McGraw Hill Book Company. New York.

		L	T	P	C
ARC 114	**ARCHITECTURAL DESIGN STUDIO - I**	**0**	**0**	**12**	**6**
	Prerequisite				
	Nil				

PURPOSE:
Design exercises involving **small Architectural design problems involving simple spatial organizations** starting from single space and progressing to small functional grouping of spaces.

INSTRUCTIONAL OBJECTIVES:
Sketching as a tool for visualization of various design alternatives should be emphasized. The use of 3D HOME software and models is also recommended for visualization.

INTERIOR ELEMENTS AS GENERATORS OF DESIGN (RESIDENCES) 60
Walls, partitions, doors, windows, floors, roof, ceiling, stairs, cupboards, wardrobes, storage cabinets and furniture could combine in multi-various ways to generate distinctive **Interior design solutions** that are representative of a Concept or theme – Ex. Master Bedroom with a study and attached toilet / Kitchen with store and utility space / Living and dining spaces with a foyer / Child bedroom with study and attached toilet etc.

ARCHITECTURE AS A DESIGN RESPONSE TO THE PHYSICAL ATTRIBUTES OF A SITE 60
Location, access, topography, surroundings and site elements such as trees, rock, views etc. – Design programs for small **residential buildings**, and similar proto types can be explored – Study of the architectural style of an eminent architect & the generation of design proposals using the same - Ex. Weekend cottage on a Beach /Hill /Farm/Forest etc or a Workspace (Office/Studio/clinic) cum residence

ABSTRACTING NATURAL FORMS TO GENERATE DESIGN FOR A SMALL STRUCTURE 60
The Design approach of copying or abstracting patterns and **forms existing in nature** can be encouraged - Ex. Milk parlor / snack kiosk / Garden pavilion / Entrance portal with a security booth / Bus stop with toilet and petty shop etc.

TOTAL 180

TEXT BOOK

1. Mike w.Lin, *Drawing & Designing* with confidence – Astep by step guide, John Wiley &sons,USA,1998.
2. Criss B.Mills, *Designing with models* : A Studio guide to making & using architectural models, Thomson & Wadsworth, USA,2000.

REFERENCE BOOKS
1. DeChiara and Callender, *Time saver standards for building types*, Mc Graw hill company
2. Bousmaha Baiche & Nicholas Walliman, Neufert Architect's data, Blackwell science ltd.
3. Ramsey / Sleeper,National *Architectural graphic standards*, The American Institute of Architects
4. Building Code – ISI
5. Sam F Miller, *Design process*– Van Nostrand Reinhold

		L	T	P	C
ARC 116	**ARCHITECTURAL DESIGN Exam – Ist year**	**0**	**0**	**0**	**1**
	Prerequisite				
	Nil				

III SEMESTER

		L	T	P	C
ARC 201	**STRUCTURAL MECHANICS**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE
To introduce the concepts of behavior of structural components and simple analytical techniques.

INSTRUCTIONAL OBJECTIVES
By the end of the course the student shall be capable of analyzing simple tension and compression members, beams and their behavior in terms of deflection.

UNIT-1 STATICS OF RIGID BODIES, STRESS & STRAIN AT A POINT **9**
statics of rigid bodies- Equivalent system of forces - External and internal forces - Free body diagrams
stress and strain at a point - Tension, compression and shear stresses, Hooke's law - Simple determinate problems - Relationship between elastic constants - Determination of principal stresses - Analytical method only

UNIT-2 GEOMETRICAL PROPERTIES OF SECTIONS **9**
Centroid, Centroidal axes - Moments of Inertia - Polar moments of Inertia - Principal moments of Inertia for Symmetrical sections only - Concept of neutral axis.

UNIT-3 ANALYSIS OF STATICALLY DETERMINATE PLANE TRUSSES **9**
Perfect frames - Stable support conditions - Types of trusses - Analysis of force in truss members by method of joints.

UNIT-4 BEAMS AND BENDING **9**
Beams and supporting conditions - Types of supports – Shear force and bending moment for Simply supported, Cantilever and Over hanging beams - Theory of simple bending - Stress distribution at a cross section due to bending moment and shear for Rectangular, I and T sections.

UNIT-5 BEAMS & DEFLECTION, THEORY OF COLUMNS **9**
Beams and Deflections
Determination of deflection for simply supported and Cantilever beams using Macaulay's method
Theory of Columns
Axial load - Combined bending and axial load – Euler's and Rankine formulae for columns

TOTAL 45

TEXT BOOKS
1. POPOV, E.P., *Mechanics of solids*, Prentice - Hall Inc, Englewood Cliffs, New Jersy - 1976
2. S. Ramamrutham and Narayanan R., *Strength of Materials*, Dhanpat Rai Publications, New Delhi, 2002

REFERENCE BOOKS

1. Timoshenko, C.P., and Gere., *Mechanics of materials*, McGraw - Hill Book Company, New York, 1984
2. Khurmi R.S., A text book of *Engineering Mechanics*, S. Chand and Co, New Delhi,1999
3. Laudner T.J. and Archer R.R., *Mechanics of Solids in Introduction*, McGraw - Hill International Editions, 1994
4. Junarkar S. B*., Mechanics of Structures Vol 1*, Charotar Publishing House, India, 1995

		L	T	P	C
ARC 203	**HISTORY OF EUROPEAN ARCHITECTURE I**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

To impart knowledge about the art & architecture of the European, Egyptian & Middle eastern cultures, which have served as the cradle of human civilization during the ancient and the classical periods.

INSTRUCTIONAL OBJECTIVES

The course creates awareness about the various factors that influence the architectural productions of a particular culture and race. It also analyses the planning, construction, and aesthetics of important historical buildings and develops an appreciation of architectural style as a product of the time, place and culture.

UNIT-1 ANCIENT EGYTIAN ARCHITECTURE 8

Factors influencing Egyptian Architecture – Evolution of Tomb and Temple architecture - Outline of Architectural Character – Examples – The Great Pyramids at Gizeh, Great Temple of Ammon at Karnak, Mortuary temples of Rameses at Thebes and Queen Hatsheput at Darel bahari.

UNIT-2 ANCIENT ARCHITECTURE OF WEST ASIA 8

Evolution of Sumerian, Babylonian and Persian cultures – Factors influencing west asian architecture - Outline of architectural character - Examples - Ziggurat at Ur, Palace of Sargon at Khorsabad, and Palace of Persepolis.

UNIT-3 CLASSICAL GREEK ARCHITECTURE 10

Evolution of City states -The development of Hellenic & Hellenistic Art, Sculpture and Architecture – Factors influencing Greek architecture - Outline of architectural character - Orders in Greek architecture - Doric, Ionic and Corinthian. – Optical corrections in Greek temples - Examples – Parthenon & Erectheon at the Acropolis of Athens , Theatre of Epidaurus, Agora and Stoa.

UNIT-4 ROMAN ARCHITECTURE 10

Evolution of Republican states in Italy – Roman masonry types – Methods of vault and dome construction – Tuscan and Composite order - Factors influencing Roman architecture - Outline of architectural character - Examples – Pantheon & Colloseum at Rome, Thermae of Caracalla, Basilica of Constantine, Circus Maximus at Rome.

UNIT-5 EARLY CHRISTIAN AND BYZANTINE ARCHITECTURE 9

Evolution of church form from the roman basilica – Factors influencing Early Christian architecture - Outline of architectural character - Example - St.Clemente at Rome - Schism and the creation of Eastern and western roman empires – Factors influencing Byzantine architecture - Development of the dome & pendentive in Byzantium – Architectural character - Example - St.Sophia at Constantinople.

TOTAL 45

TEXT BOOKS

1. Sir Banister Fletcher, A History of Architecture, 19th Edition, University of London, The Antholone Press, 1986
2. G.K.Hiraskar, Great Ages of World Architecture, Dhanpat Rai & Sons, Delhi.

REFERENCE BOOKS

1. Pier Liugi Nervi, General Editor - History of World Architecture - Series, HARRY N.Abrams, Inc. Pub, New York, 1972.
2. S.Lloyd and H.W.Muller, History of World Architecture Series, Faber and Faber Ltd., London, 1986
3. Spiro Kostof - History of Architecture - Setting and Rituals, Oxford University Press, London, 1985

		L	T	P	C
ARC 205	**CLIMATE RESPONSIVE ARCHITECTURE**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

This subject area also known by the term building science in earlier times enlightens the students to the processes by which building and entire habitats can be designed to respond to nature, with climate as the basic parameter of design.

INSTRUCTIONAL OBJECTIVES

- Clear understanding of the various climate elements such as radiation, air temperature , humidity and wind speed and the methods of heat flow in buildings over a 24 hour cycle.
- It also includes the study of vernacular architecture in various climates of the tropical region and how the form, materials and building techniques are adapted to the climate of the place.

UNIT-1 CLIMATE &THERMAL COMFORT 9

Global climatic factors, elements of climate, classification & characteristics of tropical climates, site climate and Urban climate - Thermal balance of the human body, Thermal comfort indices – Effective temperature, CET, calculation of comfort zone & determination of over heated & under heated periods.

UNIT-2 SOLAR GEOMETRY &DESIGN OF SUNSHADING DEVICES 9

Apparent movement of the sun, sun path diagrams **(**solar chart) - Solar angles, Shadow angles, solar shading masks. etc - Exercises on plotting isopleths, transfer of isopleths to solar chart, fitting a shading mask over the overheated period & design of sun shading devices for different orientations.

UNIT-3 PRINCIPLES OF THERMAL DESIGN IN BUILDINGS 9

Thermal quantities – heat flow rate, conductivity (k–value) & resistivity, conductance through a multi-layered body, surface conductance, transmittance – calculation of U- value – convection , radiation , concept of sol-air temperature & solar gain factor - exercises in heat loss & heat gain under steady state conditions -.Periodic heat flow in building – time lag & decrement factor & its application in selection of appropriate materials for walls & roof. Effect of Insulation & cavity on time- lag.

UNIT-4 VENTILATION & DAY LIGHTING 9

Functions of ventilation – stack effect due to the thermal forces, wind velocity – wind rose diagram, wind pressure - Air movement through building & around buildings – factors affecting indoor air flow , wind shadow etc. - The nature of light , its transmission , reflection – colored light, the munsell system – photometric quantities – illumination, day lighting prediction – the daylight design graph.

UNIT-5 DESIGN FOR CLIMATIC TYPES 9

Building design & lay out planning consideration for warm humid, hot dry, composite & tropical upland climates, climatic data sets – analysis – climate graph – the Mahoney tables & its recommended specification - Exercises on design of small buildings for various climates.

TOTAL 45

TEXT BOOK

1. O.H. Koenigsberger, *Manual of Tropical housing and building* – Climatic Design, Orient Longman, Chennai, 1975.

REFERENCE BOOKS

1. M .Evans – *Housing, Climate & Comfort* , Architectural Press, London ,1980.
2. E.Schild & M.Finbow – *Environmental Physics in construction & its application in Architectural Design* , granadar , london, 1981.
3. B.Givoni - Man, *Climate & Architecture*, Applied Science, Essex 1982.
4. Donald Watson & Kenneth labs – *Climatic Design* – Mcgraw hill NewYork 1983.
5. A.Konya- *Design Primer for Hot Climates*, Architectural Press, London, 1980.

		L	T	P	C
ARC 207	**DESIGN THEORY**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To impart knowledge about the various processes in design that have been prevalent in the world over time.

INSTRUCTIONAL OBJECTIVES

Student is expected to understand the various design processes that have evolved and apply the same to the process of architectural design. Design as a problem solving exercise is encouraged.

UNIT-1 DESIGN **6**

Definition of design, understanding of design, purpose of design, nature of good design and evaluation of design, types of design classifications, role of designer, design in history.

UNIT-2 DESIGN PROCESS **6**

Context for architectural design problems, design process, stages in the design process, different considerations, different ideas of design methodology.

UNIT-3 DESIGN PROBLEMS AND SOLUTIONS **6**

Different approaches to design, problem solving or intuitive, formulation of problems, nature of creative design problems, goals in design.

UNIT-4 DESIGN THINKING **6**

Understanding the terms - creativity, imagination, etc. Theories on thinking, convergent and divergent thinking, lateral and vertical thinking, creative techniques like checklists, brainstorming, syntactic, etc. design puzzles and traps, blocks in creative thinking.

UNIT-5 DESIGN CONCEPTS, PHILOSOPHIES AND STRATEGIES **6**

Various approaches to generate ideas for architectural design - types of concepts, personal philosophies and strategies of individual designers, channels that foster creativity in architecture.

TOTAL: 30

TEXT BOOKS

1. Geoffrey Broadbent - Design in Architecture - Architecture and the human sciences - John Wiley & Sons, New York, 1981
2. Nigel Cross - Developments in Design Methodology, John Wiley & Sons, 1984

REFERENCES

1. Bryan Lauson - How Designers Think, Architectural Press Ltd., London, 1980.
2. Tom Heath - Method in Architecture, John Wiley & Sons, New York, 1984

		L	T	P	C
GE0108	**VALUE EDUCATION**	**1**	**0**	**0**	**1**
	Prerequisite				
	Nil				

UNIT-1 INTRODUCTION **3**

Value Education—Introduction – Definition of values – Why values? – Need for Inculcation of values – Object of Value Education – Sources of Values – **Types of Values**:

i) Personal values
ii) Social values
iii) Professional values
iv) Moral and spiritual values
v) Behavioral (common) values

UNIT-2 PERSONAL VALUES **3**

Personal values – Definition of person – Self confidence – Self discipline – Self Assessment – Self restraint – Self motivation – Determination – Ambition – Contentment – Humility and Simplicity - Sympathy and Compassion – Gratitude -Forgiveness – Honesty – Courtesy.

UNIT-3 SOCIAL VALUES **3**

Social values – Definition of Society – Units of Society - Individual, family, different groups – Community – Social consciousness – Equality and Brotherhood – Dialogue – Tolerance – Sharing – Responsibility – Co-operation Freedom – Repentance and Magnanimity.

UNIT-4 PROFESSIONAL VALUES **3**

Professional values – Definition – Competence – Confidence – Devotion to duty –Efficiency – Accountablility – Respect for learning /learned – Willingness to learn-Open and balanced mind – Team spirit – Professional Ethic – Willingness for Discussion – Aims – Effort – Avoidance of Procrastination and slothfulness –Alertness.

UNIT-5 BEHAVIORAL VALUES **3**

Behavioral values – Individual values and group values – Good manners at home and outside – Equality – Purity of thought, speech and action – Understanding the role of religion – Faith – Understanding the commonness of religions – respect for other faiths – unity in diversity – Living together – Tolerance – Non-violence – Truthfulness – Common aim – Unified effort towards peace – Patriotism.

TOTAL 15

TEXT BOOK

1. Dr. S. Ignacimuthu S. J., *Values for life*, Better yourself Books, Bandra Mumbai-600 050 (1999).

REFERENCE BOOKS

1. *Values (Collection of Essays).,* Published by : Sri Ramakrishna Math., Chennai—4.,(1996)
2 .Prof. R.P.Dhokalia.,Eternal *Human Values NCRT* –Campus Sri Aurobindo Marg., New Delhi - 110 011.
3. Swami Vivekananda., Education., Sri Ramakrishna Math., Chennai-4(1957)

4. Tirukural (English Translation by Dr.G.U.Pope).
5. The Bible
6. The Kuran
7. The Bagavath Geetha

		L	T	P	C
ARC 209	**BUILDING SERVICES I**	**2**	**0**	**2**	**3**
	Prerequisite				
	Nil				

PURPOSE
To create awareness about the importance of sanitation, domestic water supply and fire services

INSTRUCTIONAL OBJECTIVES
Development of technical and practical knowledge in these services.

UNIT-1 WATER SUPPLY **12**
Water requirements for different types of buildings, simple method of removal of impurities, water saving practices and their potential Service connection from mains, sump and storage tank, types and sizes of pipes, special installation in multistoried buildings. Material, types of fixtures and fitting for a contemporary bathroom– taps – quarter turn, half turn, ceramic, foam flow etc, hot water mixer, hand shower
Rainwater harvesting to include roof top harvesting, type of spouts, sizes of rainwater pipes and typical detail of a water harvesting pit

UNIT-2 DRAINAGE **12**
Principles of drainage, surface drainage, shape and sizes of drains and sewers, storm water over flow chambers, methods of laying and construction of sewers
Traps – shapes, sizes, types, materials and function, Inspection chambers - sizes and construction, **Ventilation of House drainage:** Anti siphonage pipe, system of plumbing - single stack , one pipe system, one pipe partially ventilating system and two pipe system, grey water recycling and dual plumbing
Types of fixtures and materials: sinks, shower tray, shower temple, bath tub, Jacuzzi, water closets, flushing cisterns, urinals, sinks , wash basins, bidet, etc.
Design of Septic tank, Oxidation pond, Dispersion trench and soak pits. Arrangements of fixtures in a bathroom
Treatment system- Root zone treatment system, Decentralized Wastewater Treatment Systems (DEWATS), Soil Bio technology, packaged Bio-Reactor System

UNIT-3 SOLID WASTE DISPOSAL **5**
Approaches for solid waste management, Solid wastes collection and removal from buildings. On-site processing and disposal methods, guidelines for municipal solid waste management, e-waste management
Disposal of Wastes: Sanitary land filling, Composting, Vermi-compost, Incineration, Pyrolysis

UNIT-4 FIRE FIGHTING SERVICES **12**
Classification of buildings based on occupancy , causes of fire and spread of fire, Fire fighting, protection and fire resistance, Fire fighting equipment and different methods of fighting fire.
Combustibility of materials, Structural elements and fire resistance, Fire escape routes and elements – planning and design.
Wet risers, dry risers, sprinklers, heat detector, smoke detectors, fire dampers, fire doors, etc.

UNIT-5 PLUMBING AND FIRE FIGHTING LAYOUT OF SIMPLE BUIDINGS **4**
Application of above studies in current design problems and preparing design layout and details - Plumbing layout of residential and public buildings**,** Fire fighting layout, Reflected ceiling plan of smoke detectors / sprinklers, etc.

TOTAL 45

TEXT BOOKS

1. S.C.Rangwala, *Water supply and sanitary engineering*, Charotar publishing house.

REFERENCE BOOKS

1. Charangith shah, *Water supply and sanitary engineering*, Galgotia publishers.
2. A. Kamala & DL Kanth Rao, *Environmental Engineering*, Tata McGraw – Hill publishing company Limited.
3. Technical teachers Training Institute (Madras), *Environmental Engineering*, Tata McGraw Hill publishing Company Limited.
4. M.David Egan, *Concepts in Building Fire Safety*.
5. V.K.Jain, *Fire Safety in Building*
6. E.G.Butcher, *Smoke control in Fire-safety Design.*
7. National Building Code 2005.

		L	T	P	C
ARC 211	**BUILDING MATERIALS & CONSTRUCTION -III**	**1**	**0**	**3**	**3**
	Prerequisite				
	Nil				

PURPOSE

This course is a combination of lecture & studio classes aimed at developing the students understanding of material properties and interior design construction techniques.

INSTRUCTIONAL OBJECTIVES

To expose the students to different materials of construction, progressively and to enable them to represent the different building components through relevant drawings**.**

UNIT-1 WOOD 6

Softwood and Hardwood – physical properties and uses – Defects – Conversion – seasoning – Decay and preservation of **timber** – Fire retardant treatment – Anti termite treatment. Industrial timber – ply wood, hard board, jolly board, Block board, particle board. Fiber board – properties and uses.

UNIT-2 GLASS, PAINTS & DISTEMPERS 3

Glass: - Classification of glass, types of glass, physical properties and uses of glass, special varieties of glass and Architectural glass. **Paints:** characteristic of an ideal paint, types of paints, defects in painting, painting on different surfaces. **Varnishing**: characteristics of an ideal, varnish types of varnishes, process of varnishing. **Distemper:** properties of distempers, process of distempers. **Wall finishes:** wall paper, whitewashing and colour washing for walls.

UNIT-3 PARTITIONS & SHELVES & FALSE CEILING 18

Partitions : simple paneled and glazed partitions – fixed silding , folding , sliding & foldin**g . Shelves:** show room shelves, counters, cabinets, and storage. **Falls celling:** falls celling of interior spaces using wood panels, glass, thermacol, gyp-board, plaster of Paris, aluminum strips & perforated metal sheets.

UNIT-4 THERMAL INSULATION AND ACOUSTICS INSULATION 15

Thermal insulation: Heat transfer heat gain/ loss by materials - vapour barriers and rigid insulations, blanket, poured and reflective insulation – properties and uses of spun glass foamed glass, cork, vegetable fiber**s** Gypsum plaster of paris hydride gypsum properties and uses **. Acoustics :** Definition of sound and noise Reverberation time echo ,sound, foci **Acoustics insulation**: porous, baffle and perforated materials such as Acoustic plastic, Acoustic tiles, wood, partition board, fiber board, cook, quilts and mats – their properties and uses – current developments. **Applications:** Applications of the above insulations in seminar hall, theater and cold storage.

UNIT-5 RCC STAIRCASES 18

Types according to profile – straight flight, doglegged, quarter turn half turn, bifurcated, spiral & Helical. Structural system for the above types sloped slab, cranked slab, cantilevered slab, continuous slab& folded plate, foundation for RCC stair case. Vertical transportation Designing and detailing for physical and handicapped.

TOTAL: 60

TEXT BOOKS

1. W.B. Mickay – *Building construction Vol 1,2 and 3* – Longmans, UK 1981.
2. R.Chudley – *Building Construction Handbook* – BLPD, London 1990.
3. S.C.Rangwals – *Engineering materials* – Charotar Publishing, Anand.

REFERENCE BOOKS

1. Dr.B.C.Punmia – *Building construction*
2. R.Chudley, *construction Technology*.
3. Francies D.K.Ching – *Building Construction illustrated*. VNR, 1975.

		L	T	P	C
ARC 215	**ARCHITECTURAL DESIGN STUDIO WITH CAD- II**	**0**	**0**	**14**	**7**
	Prerequisite				
	Nil				

PURPOSE:

Design exercises that explore Architecture as responding to Social issues such as Culture, History, Religion, Politics etc.

INSTRUCTIONAL OBJECTIVES:

Students are encouraged to develop an understanding of cultural expressions & its varied manifestations in the built environment. Sketching, Model making and photography for analysis & design is essential.

UNIT-1 THE USE OF METAPHORS, SIGNS & SYMBOLS AS A DESIGN TOOL 50

Study of typical spaces & building components such as columns, roofs, windows, doors etc that symbolize a particular religion or community and using stylized expressions of the same to generate architectural design – Ex .Prayer halls for an existing church, Mosque or Temple / **Meditation center** etc.

UNIT-2 VILLAGE SURVEY & RURAL HOUSING 80

Study of the physical, socio economic and cultural aspects of a selected **village** by conducting various surveys to understand the settlement pattern, housing stock and amenities that are existing or required – To understand the linkages between Occupation, Social structure and Religious beliefs and its physical manifestation in the form of the settlement – Identification of a suitable Design intervention that would improve the quality of life – Ex. Design of housing prototypes for a particular community / occupation using rural building materials & cost effective technology. Design exercise may include the design of any facility required such as Primary health center / Community hall / Farm training center etc

UNIT-3 EXPLORATION OF STRUCTURE AS A GENERATOR OF FORM 45

Study of natural & man made structures in order to conceptualize a **hybrid structure** that would generate architectural form – Extensive modeling both physically and using computers is mandatory – Ex. Handicrafts pavilion, Fuel station (Petrol bunk) / stage for a musical or dance show / Expo pavilion etc

UNIT-4 INTRODUCTION TO DRAWING TECHNIQUES AND ADVANCED 2D DRAFTING TECHNIQUES 20

Introduction to graphical software; different 2D object drawing methods, editing objects and modifying their associated properties; texts; dimensioning Drawing unit association; scaling; associating limits; model space; organizing drawings in custom layouts, templates. **Concept** of blocks and object grouping; styles; organizing objects in layers; hatching techniques; introduction to symbol libraries.

UNIT-5 MISCELLANEOUS CONCEPTS, VIEW AND CO-ORDINATE MANAGEMENT 15

Database concepts**; Attributes** and scripts; Concepts of OLE; Introduction to Auto LISP. Different View management techniques; Concept of UCS; Icon management

TOTAL: 210

TEXT BOOK

1. *Sketch Plan Build* :World class architects show how it is done, Harper design, New york, 2005
2. MarkMorris, *Architectureand the Miniature*: Models, John Wiley & sons, USA,2000.

REFERENCE BOOKS

1. *Time saver standards for building types*,DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect's data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd.
3. *National Architectural graphic* standards,Ramsey / Sleeper, The American Institute of Architects
4. National Building Code – ISI
5. New Metric Handbook – Patricia Tutt and David Adler – The Architectural Press

IV SEMESTER

		L	T	P	C
ARC 202	**STEEL & MASONRY STRUCTURES**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

- To enable students to analyse and design simple timber structural members and steel structural components.
- To enable the students to select suitable steel roof truss for different spans of industrial buildings.
- To enable students to design masonry walls and footings.

INSTRUCTIONAL OBJECTIVE

By the end of the course the students shall be confident enough to independently workout the loads coming over structural components like timber and steel tension members, compression members, beams and design them as per BIS codes. The students can design masonry structures like walls, columns, and foundation incorporating earthquake resistant features.

UNIT-1 STEEL STRUCTURES **9**

Introduction Properties of Indian standard rolled steel section – Use of IS 800 and steel tables – Permissible and stresses in tension, compression and shear. **Connections:** Welded and bolted connections – Types of failure – Design of welded and bolted connections for members subjected to axial forces.

UNIT-2 TENSION AND COMPRESSION MEMBERS **9**

Steel structures – Tension and compression members – Design of single angle and double angle sections in tension – Design of compression members – Slenderness ratio – Design of simple and compound sections – Design of lacings and battens.

UNIT-3 BEAMS **9**

Principal beams, allowable stresses, General specifications, Design of **laterally supported beams.**

UNIT-4 STEEL ROOF TRUSSES **9**

Types of **roof trusses** – Selection of trusses according to the span – Estimation of gravity loads and wind loads – Use of BIS and book SP-38 in analyzing and design of trusses – gusseted plate connections (Theory Only).

UNIT-5 MASONRY **9**

Strength of bricks and masonry- **design of walls, piers, columns**-design of footings for walls and columns-use of nomograms - **earthquake resistant features** in masonry buildings as per BIS codes – Masonry retaining walls.

TOTAL 45

TEXT BOOKS

1. Ramachandra .S, *Design of steel structures Vol*. I, Standard publication, New Delhi, 1992
2. Vazirani .V.N, and Ratwani .M.M, *Steel structures*, Khanna Publications, New Delhi, 1995
3. Anand .S and Arya, *Masonry and Timber Structures Including Earthquake Resistant Design*, Nem Chand and Brothers, Roorkee, 1987

REFERENCE BOOKS

1. Arya .A.S, Ajamani .J.L, *Design of Steel Strctures,* Nem Chand and Bros, Roorkee, 1999

2. Duggal, *Design of Steel structures*, Tata McGraw Hill Company, New Delhi, 2000
3. Lin .T.R, and Scalzi .J.B, *Design of Steel structures* – Bressler Weley Eastern Pvt. Ltd., New Delhi, 1960
4. Dayaratnam .P, *Design of Steel Structures*, Wheelers Publishing Company Co. Ltd, 1990
5. Handbook of Typified *Designs for Structures with steel roof trusses*, SP 38 (S&T) – 1987, BIS, New Delhi, 1987
6. Code of practice for Earthquake Resistant Design and Construction of Buildings IS4326-1976, BIS, New Delhi.

		L	T	P	C
ARC 206	**SITE PLANNING**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To develop an understanding of the importance of site conditions for the creation of good architectural solutions and focus on the site as a fundamental component of building design. To examines the interrelationship of intended site use with the environment and also topography, vegetation and landscape, climate, geography, as well as theoretical aspects of site development. To emphasize the synthesis of programmatic and environmental requirements into a coherent concept for building placement and site improvements.

INSTRUCTIONAL OBJECTIVES

To expose the students to the various techniques of site analysis and planning

UNIT-1 INTRODUCTION TO SITE ANALYSIS **7**

Introduction to Site analysis, Importance of site analysis ; interrelationship between nature and human interventions , thematic traditions in site design, history of site design as a source for precedent analysis

UNIT-2 SITE INFLUENCING FACTORS **5**

On site and off site factors; Analysis of natural, cultural and aesthetic factors; topography, hydrology, soils, landforms, vegetation, climate, microclimate.; influence of water bodies

UNIT-3 DESIGN OF LANDFORMS IN A SITE **5**

Contours - representation of landforms and landform design, interpolation of contours, slope analysis, uses and function. Grading - Symbols and grading and alignment of paths/roads, angle of repose and use of retaining walls. Grading terraces. Drainage - surface drainage, functional and aesthetic considerations

UNIT-4 SITE PLANNING PRINCIPLES AND TECHNIQUES **6**

Site Zoning. Organization of vehicular and pedestrian circulation; parking ; street widths; turning radii ; street intersections ;steps and ramps. Site planning considerations in relation to water systems, sewage disposal, outdoor electrical systems.

UNIT-5 SITE CHARACTERISTICS AND DESIGN REQUIREMENTS **7**

Exploration of site planning options for residential, commerical, office, industrial and mixed-use projects; street network, civic space, and open space planning; emphasis on walkable, mixed-use, transit-oriented sustainable development.

TOTAL 30

TEXT BOOKS

1. Kevin Lynch , “Site Planning”, MIT Press, 1967
2. Time Savers Standards for Site Planning, McGraw Hill, Inc, 1995

REFERENCE BOOKS

1. Richard Untermann and Robert Small, “Site planning for cluster housing”, Van Nostrand Reinhold Company, 1977
2. Michael Laurie, “An Introduction to Landscape Architecture”, Elsevier, 1986
3. TSS for Landscape Architecture, McGraw Hill, Inc, 1995

4. John Ormsbee Simonds, “Landscape Architecture: A manual of site planning & design”, McGraw Hill, 1961.
5. Joseph De Chiarra and Lee Coppleman, “Planning Design Criteria”, Van Nostrand Reinhold Co., New York, 1968
6. Thomas H. Russ, “Site Planning and Design Handbook” Pearson Education, 2002
7. Diane Y. Carstens, “Site Planning & Design for the Elderly”, Van Nostrand Reinhold, New York, 1993
8. James B. Root, “Fundamentals of Landscaping & Site Planning”, AVI Pub. Co., Westport, 1985
9. William M. Marsh, “Environmental Analysis for Land Use and Site Planning”, McGraw-Hill, 1978
10. R. Gene Brooks, “Site Planning - Environment, Process and Development”, Prentice Hall, 1988

		L	T	P	C
ARC 204	**HISTORY OF EUROPEAN ARCHITECTURE II**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

To impart knowledge about the art & architecture of England, France and Italy during the middle ages and later period.

INSTRUCTIONAL OBJECTIVES

The course creates awareness about the various architectural movements that influenced the building traditions of the three European nations. Development of the ability to sketch Plans, sections, elevations and architectural details is also intended.

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UNIT-1 ROMANESQUE ARCHITECTURE **9**

Evolution of religious orders in Christianity – Formation of guild of arts and crafts -Factors influencing Romanesque architecture - Outline of architecture character in Italy, France and England - Examples: Cathedral, Baptistery and leaning tower at Pisa in Italy; Abbaye aux Hommes at Caen in France and Tower of London in England.

UNIT-2 GOTHIC ARCHITECTURE **10**

French gothic - Religious and social influences - Evolution of vaulting and development of structural systems - Outline of Architectural character - Examples: Notre Dame at Paris - Development of English gothic vaulting - Outline of Architectural character in England and Italy - Examples: Westminster Abbey and Hampton Court Palace at London, Doges Palace at Venice, Milan Cathedral.

UNIT-3 RENAISSANCE ARCHITECTURE IN ITALY **10**

Italian Renaissance - The idea of rebirth and revival of art – Factors influencing renaissance architecture -Outline of Architectural character during the early Renaissance, High Renaissance and Baroque Periods - Features of a typical Renaissance palace - Examples. Palazzo Ricardi - Study of the contributions of the following architects: Brunelleschi, Michelangelo and Andrea Palladio - Examples - St. Peters basilica at Rome, Villa capra in Vicenza.

UNIT-4 RENAISSANCE ARCHITECTURE IN FRANCE **8**

Factors influencing French renaissance - Architectural character during the classical & Rococo periods - Examples - Chateau de Chambord and the Louvre at Paris.

UNIT-5 RENAISSANCE ARCHITECTURE IN ENGLAND **8**

Factors influencing English renaissance - Domestic architecture in Britain during the Elizabethan, Jacobean, Baroque and Georgian periods - Study of the works Sir Christopher Wren & Inigo Jones, Examples - St. Paul's Cathedral at London and Banqueting House at Whitehall.

TOTAL 45

TEXT BOOKS

1. Sir Banister Fletcher, A History of Architecture, 19th Edition, University of London, The Antholone Press, 1986
2. G.K.Hiraskar, Great Ages of World Architecture, Dhanpat Rai & Sons, Delhi.

REFERENCE BOOKS

1. Pier Liugi Nervi, General Editor - History of World Architecture - Series, HARRY N.Abrams, Inc. Pub, New York, 1972.

2. S.Lloyd and H.W.Muller, History of World Architecture Series, Faber and Faber Ltd., London, 1986
3. Spiro Kostof - History of Architecture - Setting and Rituals, Oxford University Press, London, 1985.

		L	T	P	C
ARC 208	**BUILDING SERVICES II**	**2**	**0**	**2**	**3**
	Prerequisite				
	Nil				

PURPOSE

To create awareness about the importance of electrical and mechanical services in buildings.

INSTRUCTIONAL OBJECTIVES

Development to technical and practical knowledge in these services.

UNIT-1 ELECTRICAL SERVICES **12**

Electrical systems – Basic of electricity – single/Three phase supply – protective devices in electrical installation – Earthing for safety – Types of earthing – ISI Specifications. Electrical installations in buildings – Types of wires, Wiring systems and their choice – planning electrical wiring for building – Main and distribution boards –Principles of illumination

UNIT-2 ILLUMINATION AND LIGHTING DESIGN **16**

Visual tasks – Factors affecting visual tasks – Modern theory of light and colour – synthesis of light – Additive and substractive synthesis of colour – Luminous flux – Candle – solid angle illumination – utilization factor – Depreciation factor –MSCP – MHCP –Laws of illumination.

Classification of lighting –Artificial light sources – Spectral energy distribution – Luminous efficiency – Colour temperature – Colour rendering. Design of modern lighting – Lighting for stores, offices, schools, hospitals and house lighting. Elementary idea of special features required and minimum level of illumination required for physically handicapped and elderly in building types.

UNIT-3 ELECTRICAL LAYOUT OF SIMPLE BUILDINGS **12**

Electrical layout of a simple residential, school and commercial building

UNIT-4 HEAT VENTILATION AND AIR CONDITIONING (HVAC) **10**

Behaviour of heat propagation, thermal insulating materials and their co-efficient of thermal conductivity. **General methods of thermal insulation:** Thermal insulation of roofs, exposed walls.**Ventilation:** Definition and necessity, system of ventilation. Principles of air conditioning Air cooling, Different systems of ducting and distribution, Essentials of air-conditioning system.

UNIT-5 PUMPS AND MACHINERIES **10**

Reciprocating, Centrifugal, Deep well, Submersible, Automatic pumps, Sewerage pumps, Compressors, Vacuum pump – their selection, installation and maintenance – Hot water boilers – Classification and types of lifts, lift codes, rules structural provision: escalators, their uses, types and sizes, safety norms to be adopted – Social features required for physically handicapped and elderly – Conveyors -Vibrators – Concrete mixers – DE/AC motors – Generators – Laboratory Service – Gas, water, Air and Electricity.

TOTAL 60

REFERENCE BOOKS

1. E.R.Ambrose, *Heat pumps and Electric Heating*, John and Wiley and Sons Inc, New York, 1968.
2. Handbook for *Building Engineers in Metric systems*, NBC,New Delhi, 1968.

3. *Philips Lighting in Architectural Design*, McGraw Hill, New York, 1964.
4. R.G.Hopkinson and J.D.Kay, the *Lighting of Buildings*, Faber, and Faber, London, 1969.

		L	T	P	C
ARC 210	**BUILDING MATERIALS & CONSTRUCTION - IV**	**1**	**0**	**3**	**3**
	Prerequisite				
	Nil				

PURPOSE

This course is a combination of lecture & studio classes aimed at developing the students understanding of material properties and construction techniques of industrial buildings.

INSTRUCTIONAL OBJECTIVES

To expose the students to different materials of construction, progressively and thereby enabling them to represent the different building components through relevant drawings**.**

UNIT-1 FERROUS METALS **2**

Properties and uses of cast iron, wrought iron, pig iron and steel. Market forms of **steel:** structural steel, stainless steel, steel alloys – properties and uses.

UNIT-2 STEEL TRUSSES FRAMES, GATES AND STEEL COMPONENTS **20**

Steel trusses – saw tooth roof truss with north light glazing, simple trusses in steel, and types of connections – to foundations, steel stanchion, and beams etc. **Space frames:**- single, double & triple layered tubular space frames with globe connections, **Gates:** collapsible gate, entrance gate, rolling shutter. **Steel components:** Steel doors, (hinged, sliding) steel windows (casement window & sliding window) Steel stairs (dog legged, spiral stair) steel hand rails and balustrade grill designs for windows

UNIT-3 NON FERROUS METALS **15**

Properties and uses of aluminum,zinc,lead,copper etc: properties and uses of aluminum, aluminum windows and door**s** Horizontal sliding, louvered & casement windows and ventilators – **aluminum in interiors**: aluminum frames, partitions glazing & panels – hinged and pivoted aluminum doors and aluminum curtain wall, cladding with aluminum composite panels (ACP)

UNIT-4 PLASTICS **8**

Thermoplastics and thermosetting **plastics** – properties and architectural uses of plastics – structural plastics – Reinforced plastics and Decorative laminates-plastic coatings, Adhesives and sealants – Modifiers and Plasticizers – Fabrications of plastics. Primary plastic building products for walls, roof and partitions. Secondary building products for rooms, windows, roof lights, domes, gutters and handrails.

UNIT-5 DAMP PROOFING AND WATER PROOFING **15**

Damp proofing: Hot applied and cold applied – Emulsified asphalt, Bentonite clay. Butyl rubber, silicones, Vinyls, Epoxy resins and metallic water proofing materials, their properties and uses. **Water proofing: water proofing membranes** such as rag, asbestos , glass felt, plastic and synthetic rubber- vinyl, butyl rubber, neoprene **, polyvinyl** chilnide – **prefabricated membranes sheet lead**, asphalt their properties and uses**. Application:** application of the above in basement floor, swimming pool, and terraces.

TOTAL: 60

TEXT BOOKS

1. W.B. Mickay – *Building construction Vol 1, 2 and 3* – Longmans, UK 1981.
2. R.Chudley – *Building Construction Handbook* – BLPD, London 1990.
3. S.C.Rangwals – *Engineering materials* – Charotar Publishing, Anand.

REFERENCE BOOKS

1. Dr.B.C.Punmia – *Building construction*
2. R.Chudley, *construction Technology*.
3. Francies D.K.Ching – *Building Construction illustrated*. VNR, 1975.

		L	T	P	C
ARC 212	**3D MODELLING & IMAGE EDITING**	**0**	**0**	**3**	**2**
	Prerequisite				
	Nil				

PURPOSE

To enhance the visualizing skills of the students by exposing them to the latest modeling software's.

INSTRUCTIONAL OBJECTIVES

To familiarize the students with the concepts of 3D modeling. To enable them to experiment with forms, mapping, rendering and presentation techniques

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UNIT-1 INTRODUCTION TO 3DS MAX **9**

An overview of GUI, types of modeling, transforming objects, Compound objects, modifiers & modifier stack.

UNIT-2 MODELLING TECHNIQUES **9**

Lathing, displacement, lofting, Boolean operations using standard and compound primitives, **modeling** with lofts, low polygon modeling and nurbs modeling**.**

UNIT-3 TEXTURES AND TEXTURE MAPPING **9**

Using **material editor**, material browser, mapping textures, lighting, cameras and render effects, environment mapping, fogs and atmospheres.

UNIT-4 PHOTOSHOP **9**

Photoshop interface, creating and saving images, basic **image editing**, Photoshop tool box and tools, using layers, special effects.

UNIT-5 ANIMATION **9**

Various **animation techniques**, editing animation using key frames, curve editor/dope sheet, animation constraints/controller, rendering and special effects, walk throughs.

TOTAL 45

TEXT BOOKS

1.3DS MAX- *Advanced 3D modeling and animation* – C & M, CADD Centre

REFERENCE BOOKS

1. *3DS MAX 8 Bible* – Kelly C.Murdock
2. *Photoshop CS Bible* – Deke McClelland
3. Adobe Photoshop 7.0 classroom in a book – Adobe creative team

		L	T	P	C

ARC 214	ARCHITECTURAL DESIGN STUDIO - III	0	0	14	7
	Prerequisite				
	Nil				

Architecture as a Design response to the climate of a place along with exploration of design solutions at the level of site climate & microclimate – Students familiarize themselves with designing for special groups such as the elderly, the handicapped and persons with learning disabilities. Use of models & software to calculate the thermal response & natural light inside the designed building is encouraged.

.

- **Bio-climatic design approach to the planning and design of buildings** having an agglomeration of simple spaces with particular emphasis on the design of the building envelope i.e articulation of openings, choice of materials for roof & walls of different orientations etc – Integration of passive, active & hybrid solar technologies with the design proposals are encouraged – Ex. Youth hostel / Nursing home / old age home / charity homes etc **85**
- **Exploration of light quality in spaces for study and interaction** – Study of the intensity & quality of natural light under various circumstances and its transformation in interiors due to location, size and material of glazed openings – Use of high openings, clear-storeys, dormer windows, light wells, courtyards and other contraptions to bring light into the interior of buildings –To analyze how spaces such as corridors, lobbies, courtyards etc can be designed to foster interaction – Ex. Nursery & Primary school / Library / Students center / Cafeteria**.** **85**
- **Contemporary trends in retail outlets & Showrooms –** Study of urban culture & its manifestations in retail interiors & shop fronts – branding & its architectural expressions – Ex. Retail outlets for ready made garments, watches, footwear etc./ Coffee pubs, Ice cream parlors etc. **40**

TOTAL 210

TEXT BOOK

1. Richard Weston, *Plan sections & elevations of key buildings* of the 20th century, Lawrence king publishing, London,2004.

REFERENCE BOOKS

1. *Time saver standards for building types*, DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect's data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd.
3. National Building Code – ISI
4. *Time saver standards for landscape architecture* – Charles W Harris – Mc Graw Hill
5. *New Metric Handbook* – Patricia Tutt and David Adler – The Architectural Press

		L	T	P	C
ARC 216	ARCHITECTURAL DESIGN Exam – 2nd year	0	0	0	1
	Prerequisite				
	Nil				

V SEMESTER

		L	T	P	C
ARC 301	**REINFORCED CONCRETE STRUCTURES**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

To introduce the material concrete and enable students to carry out limit state method of design of flat slabs, beams, columns and foundation using BIS codes and hand books.

INSTRUCTIONAL OBJECTIVE

By the end of the course the student shall be capable of designing one way slab, two way slab, R.C.C. beams, Flat Slabs columns and shallow foundations using limit state method.

UNIT-1 LIMIT STATE DESIGN OF SLABS **9**

Basic design concepts – Limit state method of design – recommendations in the code book - Classification of slabs – Estimation of loads – Design of one way, two way, circular and continuous slabs using SP – 16.

UNIT-2 LIMIT STATE DESIGN OF BEAMS **9**

Estimation of loads on beams – Transfer of load from slab to beam – Design of singly, doubly reinforced – Design of simply supported beams – **Design of continuous beams** using codal coefficients - Detailing – Use of SP-16 for the design.

UNIT-3 DESIGN OF FLAT SLABS **9**

Advantages of flat slab construction – Components of flat slab – Configuration of columns **– Design of flat slab** by direct design method as per BIS codes.

UNIT-4 LIMIT STATE DESIGN OF COLUMNS **9**

Estimation of loads on columns – Load transfer from slab and beam to columns – Long and short columns – Rectangular and circular columns – Columns subjected to uni-axial and bi-axial bending – **Design of columns** using column interaction diagrams – Use of SP-16 – Detailing.

UNIT-5 LIMIT STATE DESIGN OF FOUNDATION **9**

Types of R.C.C. foundation – Individual, Combined, Strip footings – Raft foundation (Theory only) – Design of individual column footings – Rectangular Sloped footings – Eccentric footings with projection on one side only – Design of combined footings – With and without beams.

TOTAL 45

TEXT BOOKS

1. Park .R and Paulay .T, Reinforced *Concrete Structures*, John Wiley & Sonc Ic., New York, 1975
2. Simha .N.C and Roy .S.K, *Fundamentals of Reinforced Concrete*, S.Chand & Co. Ltd., New Delhi, 2001

REFERENCE BOOKS

1. Unnikrishna Pillai .S and Devadass Menon, *Reinforced Concrete Design*, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1998
2. Naville .A.M, *Properties of Concrete*, Pitman Publishing Co., London, 1990
3. Purushothaman .P, *Reinforced Concrete Structural Elements*, Tata McGraw Hill Publishing Co Ltd., New Delhi, 1984
4. Ramamrutham .S and Narayanan .R, *Reinforced Concrete Structures,* Dhanpat Kai Publication, New Delhi, 1997

		L	T	P	C
ARC 303	**EARTHQUAKE RESISTANT ARCHITECTURE**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To create awareness about the importance of seismic forces affecting building design and to impart knowledge about seismic safety aspects.

INSTRUCTIONAL OBJECTIVES

Basic understanding of elementary seismology and behavior of buildings during earthquakes. Exposure to seismic design principles, structural detailing and concepts of site planning and architectural design for earthquake resistance.

UNIT-1 ELEMENTARY SEISMOLOGY **5**

Earthquake occurrence in the world, plate tectonics, faults, earthquake hazard maps of India & and the States.
Causes of earthquake, seismic waves; magnitude, intensity, epicenter and energy release, characteristics of strong earthquake ground motions, Flexibility of long & short period structures; concepts of response spectrum.
Seismological Instruments: Seismograph, Accelerograph, Seismoscope.

UNIT-2 SITE PLANNING, BUILDING FORMS AND ARCHITECTURAL DESIGN CONCEPTS FOR EARTHQUAKE RESISTANCE **6**

Historical experiences, Site Selection & Site Development
Building forms:- Horizontal & vertical eccentricities, mass and stiffness distribution, soft storey etc.
Seismic effects related to building configuration. Plan & vertical irregularities, redundancy & setbacks.
Special Aspects:- Torsion, appendages, staircases, adjacency, pounding
Contemporary international approaches

UNIT-3 PERFORMANCE OF GROUND AND BUILDINGS IN PAST EARTHQUAKES **6**

Earthquake Effects:- On ground, soil rupture, liquefaction, landslides.
Behaviors of various types of buildings, lifelines and collapse patterns.
Behaviour of Non Structural Elements like services, fixtures, mountings.
Social & Economic Consequences of earthquakes.

UNIT-4 SEISMIC DESIGN PRINCIPLES **5**

Concept of seismic design, stiffness, strength, period, ductility, damping, hysteric energy dissipation, center of mass, center of rigidity, torsion, design eccentricities.
Ductility based design: Design of energy absorbing devices, Seismic base isolation and seismic active control

UNIT-5 STRUCTURAL DETAILING & EARTHQUAKE RESISTANT CONSTRUCTION DETAILS **8**

IS Code provisions for the buildings:- IS:1893-2002, IS:4326-1993 Horizontal & vertical seismic co-efficients, valuation of base shear, distribution of shear forces in multistorey bldg. Seismic Detailing of Masonry buildings (IS: 4326), Seismic Designs & Detailing of RC & Steel Buildings: IS: 1893 - 2002; IS: 13920 - 1993; IS: 456 - 2000; IS: 800 - 2004.
Special reinforcing and connection details in structural drawings. Various Types and construction details of Foundations, soil stabilization,retaining walls, plinth fill, flooring, walls, openings, roofs, terraces, parapets, boundary walls, under ground and overhead tanks, staircases and isolation of structures.
Local practices: traditional regional responses.

TOTAL 30

TEXT BOOKS

1. Ed. CVR.Murthy & SK.Jain, Course notes on Seismic design of Reinforced concrete structures, IIT Kanpur, 2000
2. Earthquake tips, Learning earthquake design and construction, CVR.Murthy, National information centre of earthquake engineering, IIT Kanpur & BMTPC New Delhi

REFERENCE BOOKS

1. Chopra AK, Dynamics of structures, prentice hall, 1995
2. Guidelines for earthquake resistant non-engineered construction, Revised ed. Of “Basic concept of seismic codes” Vol I part 2, 1980, IAEE, Japan, reprinted by National information centre of earthquake engineering, IIT Kanpur.

		L	T	P	C
ARC 305	**CONTEMPORARY WESTERN ARCHITECTURE**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

Introducing the students to various Design philosophies of Modern & Post Modern Architecture.

INSTRUCTIONAL OBJECTIVES

To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.

UNIT-1 SELF CONSCIOUS MODERNITY **10**

Neo classicism, industrial revolution and its impact, new materials – steel, glass, concrete, arts and crafts movement, art nouveau – works of Gaudi, Chicago school, art deco, Louis Sullivan works, Adolf Loos and his arguments on ornamentation, Futurism, Expressionism – works of Mendelssohn and taut, destijl movement, Walter Gropius: Bauhaus and Harvard, Peter Behrens and the German Werkbund.

UNIT-2 EARLY MODERN ARCHITECTURE **9**

Cubism, Constructivism, works of architects Philip Johnson **– Glass house**, **Connecticut, Seagram** Building, New York, **Mies Vander Rohe** - Barcelona Pavilion, *Illinois Institute* of Technology, Chicago, **F.L.Wright-** Falling water, Pennsylvania, Guggenheim Museum, New York **, Richard neutra** - Kaufmann Desert House, California, **Oscar Niemeyer -** Cathedral of Brasília, *Museu Oscar Niemeyer* ,Brazil **Alvar Alto** - Finlandia Hall, Finland , **Lecorbusier** – Villa Savoye , France , Notre damn Ronchamp , Paris, **Louis khan -** The National Assembly Building, Bangladesh, Kimbell Art Museum,Texas

UNIT-3 LATER MODERN ARCHITECTURE **8**

Post modernism and international style .Ideas and works of – Paul Rudolph- Arts and architecture building, Yale university, Orange County Government Center, New York, I.M.Pei - Grand Louvre, Paris, Everson Museum of Art, Kenzo Tange –Olympic arena, Tokyo, Fuji, Broadcasting center, Tokyo, Minoru Yamasaki – Dahran International airport, McGregor Memorial Conference Community Center, Detroit, Kisho Kurokawa - The Museum of Modern Art, Wakayama , Capsule tower , Tokyo, Richard Meier – Jubilee church ,Los Angeles , Smith house, Connecticut , Toyo Ito - U House,Tokyo , Serpentine Pavilion , London

UNIT-4 ALTERNATIVE PRACTICES AND IDEAS 8

Critical regionalism, works and ideas of Hassan Fathy, Geoffrey Bawa , Tado Ando, Laurie baker and Paulo soleri

UNIT-5 21ST CENTURY ARCHITECTURE 10

Deconstructivism – Works of Zaha Hadid- London aquatic complex , 2012 Olympics ,Zaragoza bridge pavilion, Spain , Daniel *libeskind* – Jewish museum, Berlin, World trade center, New York, Frank o gehry - Guggenheim museum, Bilbao, Spain , Peter Eisenman - Cardinal stadium, Arizona ,City of Culture of Galicia, Santiago Calatrova and his structural concepts- Lyon-satolas station, France, Milwaukee art museum ,U.S.A , News forms and ideas of Norman Foster - American Air Museum, Cambridge, UK, Standsted Airport, London , Greg Lynn – Embryological house, U.S.A

TOTAL 45

REFERENCE BOOKS

1. Kenneth Frampton, *Modern Architecture*: A Critical History, Thames and Hudson, London.
2. Sigfried giedion, .*Space time and Architecture*: The Grwoth of a New tradition, Harvard University Press.
3. Tzonis Alexander, *Santiago calatrova* , International Publications, January 2005, New York.
4. Steele James, *Hassan fathy - The complete works* , London : Thames and Hudson.

		L	T	P	C
ARC 307	**BUILDING MATERIALS & CONSTRUCTION –V**	**1**	**0**	**3**	**3**
	Prerequisite				

	Nil				

PURPOSE

This course is a combination of lecture & studio classes aimed at developing the students understanding of material properties and construction techniques of concrete, RCC and special concreting methods and appropriate material and technology.

INSTRUCTIONAL OBJECTIVES

To expose the students the preparation of concrete mix placing and curing. Concrete construction methods and special concrete and concreting methods. To expose to students to appropriate material Construction method.

UNIT-1 CEMENT & CONCRETE 2

Cement: Composition of cement, properties of cement, various of cement and their uses. **Concrete:** proportinoning concrete, grading of aggregates, water cement ratio, workability of concrete Estimating yield concreting. **Concreting:** form work for concreting**,** mixing, transporting and placing, consolidating and curing of concrete. various types of cement concrete , the properties and uses.

UNIT-2 SPECIAL CONCRETE AND CONCRETING METHOD 7

High density, fiber Reinforced, polymer concrete – properties & uses. Ready mixed concrete – grunting – cold weather & underwater concreting – Light weight concrete construction – Composition of lightweight concrete & its advantages – its application in building walls, roof, foundations & ornamental works.

UNIT-3 CONCRETE CONSTRUCTION 15

Introduction to RCC framed structures **concrete in foundation**: types of footing – Isolated, combined, continuous, strip raft & piles. **Concrete slabs**: one-way two way continuous & cantilever. **Concrete beams**: singly reinforced, doubly reinforced, cantilever & continuous beams. Concrete columns, floors, walls, partitions, lintels, arches, sunshades.

UNIT-4 APPROPRIATE MATERIALS 18

Walls: Rammed earth, and stabilized earth walls, soil – cement block, lato blocks, cellular concrete, hollow concrete, clay blocks, and pre cast concrete panels for walls. **Roofs/ Flooring: (**pre cast building components) Doubly curved funicular shell units, brick funicular shell roof – pre cast concrete channel units – pre cast concrete core units – structural clay blocks – hollow blocks and pre cast RCC Joist flooring system/roof system – Reinforced brick panel roofing system – two way spanning flooring system using pre cast units – Ferro cement ribbed slab and folded plates.

UNIT-5 LIFTS, ESCALATORS & CONVEYORS 18

Elevator: Study of elevators – size, capacity, speed, and Mechanical safety methods, positioning in core under planning grid. Types like passenger and freight lifts, dumbwaiters, details of lift cage, lift shaft & other mechanism. **Escalator:** Parallel and criss cross escalators, **Conveyors:** horizontal belt conveyors, horizontal moving walk way – Mechanical safety systems and automatic control.

TOTAL: 60

TEXT BOOKS

1. W.B. Mickay – *Building construction Vol 1, 2 and 3* – Longmans, UK 1981.
2. R.Chudley – *Building Construction Handbook* – BLPD, London 1990.
5. M.S Shetty, *concrete Technology,* S.Chand & Co ltd New Delhi, 1986.

REFERENCE BOOKS

2**.** Francies D.K.Ching – *Building Construction illustrated*. VNR, 1975.
3. Arthur Lyons, *Materials for Architects and Builers* – An introduction Arnold, London, 1997.
4. Don A.Watson, *construction materials* and process, Mc Graw Hill Co, 1972.

		L	T	P	C
ARC 309	**PARAMETRIC MODELING**	**0**	**0**	**3**	**2**
	Prerequisite				

	Nil				

UNIT-1 INTRODUCTION **9**

New Features of Revit, Editing and Working with Families in a Project, Concepts of Revit, creating a shared Family, Project and System settings

UNIT-2 BASIC MODEL **9**

Creating the Basic Model, Adding Doors and Windows, Floors and Floor Openings, Roof and Ceiling, Staircases

UNIT-3 MODELLING **9**

Creating Walls, Doors. Windows, openings, stairs, railings, roofs, curtain systems

UNIT-4 DOCUMENTATION **9**

Creating drawings, Creating detail from Building Model, Scheduling, Annotating and Dimensioning, Viewing the Model

UNIT-5 RENDERING **9**

Applying Materials and textures, creating a perspective vies, rendering an Exterior view, rendering an Interior vies, Creating and Recording Walkthroughs, creating 3D cutaways with Section Boxes

TOTAL: 45

TEXT BOOKS

1 Autodesk REVIT 9.1 Manual, Autodesk publications
2 REVIT 9.1 Tutorials, Autodesk publications

REFERENCE BOOKS
AUTODESK Publications

		L	**T**	**P**	**C**
ARC 311	**ARCHITECTURAL DESIGN STUDIO - IV**	**0**	**0**	**14**	**7**
	Prerequisite				
	Nil				

This Design studio intends to make students comprehend that **Architecture can also be thought of as a Design response to technology & materials.** Scholars are required to develop an understanding of contemporary technological expressions and the use of modern materials such as glass, steel, aluminium and plastics. Explorations in geometry for the determination of form & structure using computers, is encouraged.

- **Image & its induction in buildings** – Study of the architectural expressions that imbue a building with a certain image (posh, extravagant, luxurious, up market, down town, hi-tech, ethnic, contemporary etc).The relationship between a particular image and the materials & lighting should be established. Students have to understand the circulation patterns & services required in commercial buildings. Ex Shopping mall / Art gallery / marriage hall / memorial complex etc 95

- **Technological expressions** – This project intends to explore the possibility of image induction using expressions of technology for industrial buildings. Hence the functional aspects and the external form assume significance. Students are encouraged to explore architectural styles in vogue such as de-constructivism, Bauhaus ,post modern, hi-tech etc. Ex. Garment factory / watch factory / Electronic goods (computers, cellphones etc.) / Bicycle manufacturing unit etc**.** **90**

- **Emerging building types** – Certain building types that are already in vogue in developed countries are slowly emerging here also. Ex. Motel / club houses / gaming parlors / Beauty & healthcare parlors etc**.**

25

TOTAL: 210

REFERENCE BOOKS

1. *Time saver standards for building types*,DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect's data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd
3. National Building Code - ISI
4. *New Metric Handbook* – Patricia Tutt and David Adler – The Architectural Press

VI SEMESTER

		L	T	P	C
ARC 302	**PRECEDENTS IN ARCHITECTURE**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

The course intends to examine the basic similarities in architects' work over time, identify generic solutions to the design problem and to develop diagrams as an analytical tool for design. It also examines precedents in architecture to identify patterns and themes which lead to archetypal ideas that might help in the generation of architectural form.

INSTRUCTIONAL OBJECTIVES

The use of diagrams as a technique for architectural analysis results in the formation of a vocabulary to understand the work of architects, which helps the student to generate original ideas. It aims to develop a comprehensive understanding of formative ideas, organizational concepts and parties.

UNIT-1 ANALYTICAL DIAGRAMS & ITS REPRESENTATION 4

Basic 12 issues of architectural analysis - Structure, Natural light, Massing, Plan to section, Circulation to use space, Unit to whole, Repetitive to unique, Symmetry and balance, Geometry, Additive & subtractive, Hierarchy and Parti.

UNIT-2 DIAGRAMMATIC ANALYSIS OF ARCHITECTS WORKS 14

Architectural analysis using diagrams of the works of Aalvar Aalto, Tado Ando, Gunnar Asplund, Mario Botta, Brunelleschi, Romaldo Giorgola, Herzog & de Meuron, Steven Holl, Louis Kahn, Le Corbusier, Nicholas Ledoux, Edwin Lutyens, Richard Meier, Charles Moore, Jean Nouvel, Palladio, James stirling, Louis Sullivan, Mies van der Rohe, Robert Venturi, F.LWright and Peter Zumthor.

UNIT-3 FORMATIVE IDEAS 9

Plan to section or elevation – Equal, One to one-half, Analogous, proportional, Inverse – Unit to whole – Unit equals whole, Unit contained in Whole, Whole greater than sum of units, Units aggregate to form whole, units adjoin, units overlap, Units separate – Repetitive to Unique – Unique surrounded by repetitive, Unique by transformation of repetitive, unique in repetitive field, Unique added to repetitive, Unique defined by repetitive – Additive and subtractive

UNIT-4 COMPOSITION 9

Symmetry – Balance by configuration, Balance by geometry, Balance by positive & negative – Geometry – Basic geometry, Circle & square, Rectangle overlapped by circle, two squares, Nine square, Four square, 1.4 & 1.6 rectangles, Geometric derivatives, Rotated, Shifted & overlapped, Pin wheel, Radial & spiral, Grid.

UNIT-5 CONFIGURATION AND DEVELOPMENT 9

Configuration patterns – Linear use, linear circulation, Central use, central circulation, Double center, Cluster, Nested, Concentric, Bi-nuclear – Progressions – Hierarchy, Transition, transformation, Mediation – Reduction – Large plus small reduction, Part of whole reduction.

TOTAL 45

TEXT BOOK

1. Roger H Clarke & Michael Pause – Precedents in Architecture : Analytical diagrams, Formative Ideas and Partis, 3rd Edition – John Wiley & sons, 2005.

REFERENCE BOOKS

1. Rob Krier – Architectural Composition -

		L	T	P	C
ARC 304	**ARCHITECTURAL ACOUSTICS & LIGHTING**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

Knowledge about the behavior of sound & light in the built environment is of vital importance to a budding architect.

INSTRUCTIONAL OBJECTIVES

To train the students in the field of architectural acoustics & lighting design.

UNIT 1 LIGHTING DESIGN **6**

Classification of lighting – Artificial light sources – Spectral energy distribution – Luminous efficiency – Colour temperature – Colour rendering. **Design of modern lighting** – Lighting for stores, offices, schools, hospitals and house lighting. Elementary idea of special features required and minimum level of illumination required for physically handicapped and elderly in building types.

UNIT 2 INTRODUCTION AND THEORY OF SOUND **6**

Acoustics – Definitions, terms related to acoustics. **Theory of sound :** generation, propagation, transmission, reception of sound, sound waves, frequency, intensity, wavelength, sound pressure, measurement of sound, scales- decibel scale

Characteristics of speech**:** Characteristics of speech, music and hearing- distribution of energy in speech and music frequencies, intelligibility of speech, high fidelty reproduction of music. Human ear characteristics- making of sound, Binomial hearing, behavior of sound in enclosed spaces.

UNIT 3 SOUND TRANSMISSION, ABSORPTION, INSULATION **6**

Room acoustics- resonance, reverberation, echo, reverberation time, simple exercise using Sabine's formula. Acoustical requirements of different types of building Sound absorption, absorption co-efficient and their measurements, Absorbing materials used and their choices, exercises involving reverberation time and absorption co-efficient. Sound insulation, materials

UNIT 4 NOISE CONTROL AND SOUND REINFORCEMENT **6**

Sources and types of noise- in and around buildings, characteristics and effect of noise impact on human beings/ behavior, noise curves, transmission of noise, **noise control for buildings**- laws and legislation, regulations.

Sound amplification and distribution, sound reinforcement of different rooms. Environmental acoustics- legislature – related to transportation, examples- airports, railway stations, railway tracks, MRTS etc.

UNIT 5 ACOUSTICS IN BUILDING DESIGN AND CONSTRUCTION **6**

Design: Site selection, shape, volume, treatment for interior surface, basic principles in designing open air theatres, cinemas, broadcasting studios, concert halls, class rooms, lecture halls, theatres – Auditorium.

Construction: Constructional detailing, relation to walls/ partition, floor / ceiling/ opening/ windows/ doors. Insulating fittings and gadgets machine mounting and installation of machinery.

TOTAL: 30

REFERENCE BOOKS

1. Dr.V. Narasimhan – *An introduction to Building Physics*- Kabeer printing works, Chennai -5
2. S.L.Suri, *Acoustics Design and Practice*, Asia Publishing House, New York, 1963
3. Peter templeton & Saunders – *Detailing for architectural acoustics* – Architectural press, 1994
4. *Acoustical design of auditoriums* – IS2526 –ISI –1963
5. Mark Blitz et al. - *Elements of acoustics* – John Wiley & sons, 1975
6. E.R. Ambrose, *Heat pumps and Electric Heating*, John and Wiley and Sons Inc, New York, 1968.

7. Handbook for *Building Engineers in Metric systems*, NBC, New Delhi, 1968.
8. Philips *Lighting in Architectural Design*, McGraw Hill, New York, 1964.
9. R.G.Hopkinson and J.D.Kay, the *Lighting of Buildings*, Faber and Faber, London, 1969.

		L	T	P	C
ARC 306	**GREEN BUILDINGS**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

A growing worldwide concern for the conservation of energy & environment has led to the emphasis on sustainable habitats as a key solution to growing urban concerns. Sustainable architecture aims to create environment – friendly and energy efficient building by actively harnessing renewable nature sources of energy (solar energy etc) and utilizing materials that least pollute the environment.

INSTRUCTIONAL OBJECTIVES

The objectives include creating awareness of the need for green buildings and imparting knowledge of designing green buildings , advocating of the application of passive and active use of renewable energy system and the promotion of efficient use of water, materials and waste through the sustainable concept of Reduce, Recycle and Reuse.

UNIT-1 BIO CLIMATIC DESIGN CONCEPTS **9**

Green buildings- salients features- LEED rating systems by IGBC - origin from USGBC –**Concept of Sustainable sites** –Orientation to sun and Wind -Land form & orientation – Vegetation & Pattern – Water Bodies – Open Space & Built form - Plan form & Elements – Roof form – Fenestration pattern & Configuration .

UNIT-2 PASSIVE AND ACTIVE HEATING TECHNIQUES **9**

Passive Heating techniques : General principles – Direct gain systems - Glazed walls, Bay windows, Attached sun spaces etc. Indirect gain systems – Trombe wall, Water wall, Solar Chimney, Transwall, Roof pond, etc - Isolated gain systems – Natural convective loop etc. A**ctive Heating Systems** : Solar water heating systems
Case studies on buildings designed with passive and heating techniques.

UNIT-3 PASSIVE AND ACTIVE COOLING CONCEPTS **9**

Passive Cooling techniques : General principles – Evaporative cooling, Nocturnal radiation cooling, Passive Dessicant cooling, induced ventilation, earth sheltering, Berming, Wind Towers, earth – Air tunnels, Curved Roofs & Air Vents, Insulation , etc. **Active Cooling techniques :** Air coolers.
Case studies on buildings designed with passive cooling techniques.

UNIT-4 REDUCE, RECYCLE AND REUSE **9**

Water conservation by Rainwater Harvesting systems – Treatment of waste water :Physical,Chemical and Biological methods – RootZone treatment -Use of recycled water.
Use of Environment friendly materials, Embodied Energy of materials,Bio degradable materials.Recycling and Reuse of steel,Aluminium and Glass.

UNIT-5 INNOVATIVE GREEN TECHNOLOGIES AND CASE STUDIES **9**

Innovative uses of solar energy : BIPV, Solar Forest,Solar powered street elements,- Innovative materials: Phase changing materials, Light sensitive glass, Self cleansing glass- Integrated Use of Landscape : Vertical Landscape, Green Wall, Green Roof.Case studies on Green buildings : CII building,Hyderabad,Gurgaon Development Centre-Wipro Ltd. Gurgaon; Technopolis, Kolkata; Grundfos Pumps India Pvt Ltd, Chennai; Olympia Technology Park, Chennai.

TOTAL: 45

TEXTBOOK

1. Sustainable *design manual, Vols 1& 2*, The energy and resource institute, New Delhi.

REFERENCES:

1. Arvind Krishnan & Others – *Climate Responsive Architecture*, Tata Mcgraw –Hill New Delhi 2001.

2. Ralph M .Lebens – *Passive Solar Architecture in Europe* – 2, Architecture Press, London 1983.
3. Sandra Mendler, William Odell, The Guide Book Of Sustainable Design, John Wiley & Sons, 2000.
4. Lawson.B , Bulding Materials, Energy And The Environment; Towards Ecologically Sustainable Development Raia, Act, 1996

		L	T	P	C
ARC 308	**CONTEMPORARY INDIAN ARCHITECTURE**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

Introducing the students to various Design philosophies of colonial , post independent and contemporary architecture in Indian context.

INSTRUCTIONAL OBJECTIVES

To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.

UNIT-1 Architecture in colonial India **10**

Early colonial period – Examples – St.Pauls Cathedral, Calcatta .
–Architectural character of Indo-Saracenic and Classical revival –University of Madras Senate House & Rippon Building, Central railway station Chennai.– Later Colonial period – Contribution of Edwin Lutyens & Herbert Baker to the lay-out and Architecture of New Delhi – Rashtrapathi Bhavan & Parliament House.

UNIT-2 Post-Nehruvian modernist architecture **8**

Modernism, utilitarian modernism and neo-modernism, brutalism. Criticisms on the modern movement in India, countering the stigma of colonialism, the neo-vernacular, the community architectural movement, integrating the new and the old, revivalism and post-modernism.

UNIT-3 Modernism after Corbusier and khan **8**

Corbusier' works in India – Chandigarh and the Ahemadabad buildings - their influence on the modern rationalists; Louis Kahn's works in India - their influence on the empiricists.

UNIT-4 Post independent architecture **12**

Influences by post independence Architects- Architecture of **Charles Corea**- British council Library Delhi, Kanchenjunga Apartments,Mumbai , **Achuyut Kanvinde** – IIT ,Kanpur , Nehru science center , Mumbai , **Anant Raj**e- Bhopal Development Authority Headquarters, Institute for Forest Management ,Bhopal , **B.V.Doshi** – Sangath Office ,Ahemedabad ,IIM Bangalore , **Raj Rewal** – Pragati Maidan New Delhi ,Asian Games village ,New Delhi , **Uttam jain** - University of Jodhpur, Jodhpur, Neelam Cinema Theatre, Sanchore **Hasmukh C Patel's** - *Entrepreneurship Development Institute of India* ,Gandhinagar , Sabarmathi River front Development ,Ahmedabad.

UNIT-5 Works of contemporary architects **7**

Architects and their ideologies and philosophies towards architecture -
Sanjay Mohe – Lecturer hall block , IIM Bangalore , Karunashraya, Bangalore, **Sanjay Puri**- Mosaic hotel ,Delhi CIE ,Cochin **CNT** - Tata Dhan Academy, Madurai **,** Dr. Reddy's laboratory , Hyderabad , **Morphogenesis**- Pearl Academy of Fashion, Jaipur ,PVR , Bangalore, **Jaisim** –C R Simha , Bangalore , IIPM , Bangalore, **Bhooshan** – Le olive Garden , The village, Mysore .

TOTAL: 45

REFERENCE BOOKS

1. Miki Desai, *Architecture and independence*, Oxford University Press, 2000.
2. Vikram Bhatt and Peter Scriver, *Contemporary Indian Architecture*: After the Masters, Mapin.
3. Lang, Desai, Desai – *Architecture & Independence*, Oxford University Press, New Delhi.
4. Sarbjit Bahga et all, *Modern Architecture in India*, Galgotia Publishing Company, New Delhi.

		L	T	P	C
ARC 310	**INTERIOR DESIGN**	**2**	**0**	**2**	**3**
	Prerequisite				
	Nil				

PURPOSE

To study the Interior Design principles and their applications in interiors.

INSTRUCTIONAL OBJECTIVES

Detailed study of History, principles and elements that go into making of an interior space more aesthetic, pleasing and functional with a few projects as practical.

UNIT-1 INTRODUCTION TO INTERIOR DESIGN **12**

Definition of interior design - **Interior design process** - Vocabulary of design in terms of principles and elements - Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - Study and design.

UNIT-2 HISTORY OF INTERIOR DESIGN **12**

Brief study of the **history of interior design** through the ages relating to historical context, design movements and ideas etc. - Brief study of folk arts and crafts. (vernacular design in India) with reference to interior design and decoration.

UNIT-3 ELEMENTS OF INTERIOR DESIGN - ENCLOSING ELEMENTS **12**

Introduction to various **elements of interiors** like floors. ceilings, walls, staircases, openings, interior service elements. incidental elements etc. and various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects.

UNIT-4 ELEMENTS OF INTERIOR DESIGN– LIGHTING ACCESSORIES & INTERIOR LANDSCAPING **12**

Study of **interior lighting** - Different types of lighting their effects types of lighting fixtures. Other elements of interiors like accessories used for enhancement of interiors – Paintings, objects de art, etc. Interior landscaping - Elements like rocks, plants, water, flowers, fountains, paving, artifacts, etc. their physical properties, effects on spaces and design values.

UNIT-5 ELEMENTS OF INTERIOR DESIGN - FURNITURE DESIGN & SPACE PLANNING **12**

Study of the relationship between furniture and spaces - human movements & **furniture design** as related to human comfort. Function, materials and methods of construction - changing trends and lifestyles - innovations and design ideas - Study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. – Design Projects on Residential, Commercial and Office Interiors.

TOTAL: 60

TEXTBOOKS

1. Francis .D.K. Ching, *Interior Design Illus*trated, V.N.R. Pub., NY 1987.
2. Julius Penero and Martin Zelnik, *Human Dimensions and Interior space Whitney Library of Design*, NY 1979.

REFERENCE BOOKS

1. Steport - De Van Kness, Logan and Szebely, *Introduction to Interior Design* Macmillan Publishing Co., NY 1980.
2. *Inca / Interior Design* Register, Inca Publications, Chennai, 1989.
3. Kathryn .B. Hiesinger and George H.Marcus, *Landmarks of twentieth Century Design*; Abbey Ville Press, 1993.
4. Syanne Slesin and Stafford Ceiff - *Indian Style*, Clarkson N. Potter, Newyork, 1990.
5. The Impulse to adorn - *Studies in traditional Indian Architecture* - Editor Dr.Saranya Doshi, Marg Publications, 1982.

ARC 312	**ARCHITECTURAL DESIGN - V**	**L**	**T**	**P**	**C**
	Prerequisite	**0**	**0**	**16**	**8**
	Nil				

Designing for sustainability – Sustainable architecture and planning has become vital factor in the design of all buildings because the building activity is considered as one of the major pollutants of the natural environment. Study of the various techniques of Energy-efficient design and recycling technologies for water & wastes is mandatory as these have to be incorporated in the design proposals. Awareness about LEEDS rating and best practices is expected.

- **Institutional buildings** – These are buildings with complex spatial organizations, multifunctional spaces, large spans and variable circulation patterns. Environmental issues are emphasized and the Design studio aims to inculcate the techniques of designing for sustainability. Students are expected to do the landscape layout in detail to develop appreciation of a holistic environmental design. Ex. College / single specialty Hospital / theatre etc.

  120

- **Office buildings** – Office spaces require special care in design & detailing. Students get exposed to the various services, structural systems and vertical access systems such as elevators, escalators etc of multi-storeyed buildings. Knowledge about various types of cores, fire fighting systems and special building rules applicable to multi-storeyed buildings are implied. Scholars will be required to do the Interior design scheme in detail. Ex. Multi-storeyed office buildings that do not exceed G+6 floors.

  120

TOTAL 240

REFERENCE BOOKS

1. *Time saver standards for building types*,DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect's data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd
3. National Building Code - ISI
4. *New Metric Handbook* – Patricia Tutt and David Adler – The Architectural Press

		L	T	P	C
ARC 314	**ARCHITECTURAL DESIGN Exam – 3rd year**	**0**	**0**	**0**	**1**
	Prerequisite				
	Nil				

VII SEMESTER

		L	T	P	C
ARC 401	**ESTIMATION & SPECIFICATION**	**2**	**0**	**0**	**2**
	Prerequisite				

	Nil				

PURPOSE

To provide the student adequate knowledge to write the specifications for a given item of work, to work out the unit cost of individual items based on their specifications and arrive at the overall cost of the project.

INSTRUCTIONAL OBJECTIVES

- To enable the student to write specifications for various items of civil works with a view of controlling quality of work executed at site.
- To provide the student sufficient knowledge of estimation in order that he can advice prospective clients on project viability and also monitor/ control project cost.

UNIT-1 INTRODUCTION TO SPECIFICATION **8**

Specification - Definition, purpose, procedure for writing specifications for the purpose of calling tenders, types of specification. General specifications for 1st, 2nd, 3rd and 4th class buildings.

UNIT-2 SPECIFICATION FOR DIFFERENT ITEMS **12**

Specifications for the following items – Bricks; sand; cement; coarse aggregate; water; reinforcement; storing and handling of materials; Earth work in foundation; PCC; RCC; First class brick work in cement mortar; half brick thick partition in cement mortar; reinforced brick work; DPC; glazed tiles in skirting and dadoo; cement plaster; joinery in wood, steel & aluminum; painting to walls – cement paint, oil bound distemper, acrylic emulsion, enamel paint ; painting to joinery ; varnishing ; French polishing ;

UNIT-3 INTRODUCTION TO ESTIMATION **8**

Estimation – definition; purpose; types of estimate; various methods of approximate estimate of buildings.

UNIT-4 RATE ANALYSIS **7**

Rate analysis – definition; method of preparation; quantity and labour estimate for unit work; task or outturn work; rate analysis for: earth work, concrete works, first class brick work, reinforced brick work, cement plastering, DPC with cement mortar/ concrete, finishing (cement paint, distemper, acrylic emulsion, enamel paint) to walls & ceiling.

UNIT-5 DETAILED ESTIMATE **25**

Detailed estimate – data required, factors to be considered, methodology of preparation, abstract of estimate, contingencies, work-charged establishment, bill of quantities, different methods for estimating building works, methods of measurement of works.

TOTAL 60

TEXTBOOKS

1. M. Chakraborti, .Estimation, *Costing, Specification and Valuation in Civil engineering*.
2. Dutta, *Estimating and Costing*, S. Dutta and Co., Lucknow 1983

REFERENCE BOOKS

1. *PWD Specifications* of Tamil Nadu State Government
2. CPWD Specifications of Government of India

		L	T	P	C
ARC 403	**PROJECT MANAGEMENT**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

Knowledge about the methodology of executing a Project, greatly enhances the professional ability of an Architect.

INSTRUCTIONAL OBJECTIVES

To expose the students to the currently prevalent techniques in the planning, programming and management of a project.

UNIT-1 INTRODUCTION **8**

Project planning and project scheduling and project controlling, Role of Decision in project management, Method of planning and programming, Human aspects of project management, work breakdown structure, Life cycle of a project, disadvantages of traditional management system

UNIT-2 ELEMENTS OF NETWORK & CRITICAL PATH METHOD AND PERT ANALYSIS **12**

Event, activity, dummy, network rules, graphical guidelines for network, numbering of events. CPM network analysis & PERT time estimates, time computation & network analysis

UNIT-3 PROJECT TIME REDUCTION AND OPTIMIZATION **10**

Project cost, Indirect project cost, direct project cost, slope of the direct cost curve, TOTAL project cost and optimum duration, contracting the network for cost optimization, steps in cost-time optimization

UNIT-4 PROJECT UPDATING **7**

When to update? Data required for updating, steps in the process of updating

UNIT-5 RESOURCE ALLOCATION **8**

Resource usage profile: Histogram, Resource smoothing and Resource leveling, Computer applications in project management.

TOTAL 45

TEXT BOOK

1. Dr. B.C.Punmia et al. *Project planning and control with PERT and CPM*, Laxmi Publications, New Delhi

REFERENCE BOOKS

1. S.P.Mukhopadyay, *project management for Architect's and civil Engineers*, IIT, Kharagpur, 1974
2. Jerome D.Wiest and Ferdinand K.Levy, A Management Guide to PERT, CPM, prentice Hall of India Pub, Ltd., New Delhi, 1982
3. R.A. Burgess and G.White, *Building production and project Management*, The construction press, London, 1979.

		L	T	P	C
ARC 405	**URBAN DESIGN AND RENEWAL**	**2**	**2**		**4**
	Prerequisite				
	Nil				

PURPOSE

The overall goal of the course is to help students formulate an understanding of the urban forms and spaces. City history and theory will be examined. The contemporary needs of the society and the role of spaces will be dealt along with the need for design control.

INSTRUCTIONAL OBJECTIVE

Students will understand the fundamental concepts and theories of urban design and apply them in their design projects.

UNIT-1 INTRODUCTION **7**

Emergence of urban design as a discipline – **Concepts of urban design** –Urban design theories of Gordon Cullen and Kevin Lynch

UNIT-2 BASIC PRINCIPLES & TECHNIQUES IN URBAN DESIGN **15**

Urban scale, Mass and Space; Understanding components of **urban fabric** ; Making a Visual survey; Understanding the various urban spaces in the city and their hierarchy- Spaces for residential, commercial, recreational and industrial use: Special focus on streets ;Expressive quality of built forms, spaces in public domain

UNIT-3 STUDY OF URBAN SPACES THROUGH HISTORY **10**

A brief Analysis of **urban spaces in history** – in the West (Greek, Roman, Medieval and Renaissance towns) and the East (Vedic, temple towns, medieval and Islamic towns) ; Relevance of the historical concepts in the present context ;
Critical analysis of some Indian cities like New Delhi, Chandigarh

UNIT-4 RENEWAL, REDEVELOPMENT AND FORMULATING URBAN DESIGN POLICIES 8

Understanding **urban renewal** and the need for it, Scope, challenge and Implementation methods; Public participation; Townscape policies and urban design guidelines for new developments- Case studies

UNIT-5 URBAN DESIGN PROBLEM 20

Conducting an **urban design survey**, Analysis of data, Formulating urban design guidelines for an area - practical problem solving

TOTAL 60

REFERENCE BOOKS

1. *The Concise townscape*- Gordon Cullen,The Architectural press
2. *Image of the city* - Kevin Lynch
3. *Architecture of town and cities* - Paul D. Speriregon, The MIT press
4. *Urban design* – Ornament and decoration , Cliff Moughtin, Bath Press
5. *Urban design* – street and square, Cliff Moughtin, Bath Press
6. *Town and square* - Paul Zucker
7. *The urban pattern* - Arthur B Gallion, CBS publishers
8. *Architecture and the urban experience* - Raymond J Curran. Van Nostrand Reinhold Company
9. Indian city in the arid West - Kulbashan Jain , Aadi Centre
10. *Indian mega city and economic reforms* - A.K.Jain , Management publishing Company

		L	T	P	C
ARC 407	**LANDSCAPE ARCHITECTURE & ENVIRONMENTAL SCIENCES**	**2**	**2**	**0**	**4**
	Prerequisite				
	Nil				

PURPOSE

Landscape design is a vital component of architecture since it predominantly deals with the planning of open space.

INSTRUCTIONAL OBJECTIVES

- Understanding environment, human interventions and the impacts on it and knowledge about various measures of protecting it.
- Exposure to various concepts, ideas and techniques prevalent in landscape architecture

UNIT-1 Environmental Science 10

Ecology and concept of Ecosystem, Environmental deterioration, Environment protection measures - water conservation, rain water harvesting, solid waste management, watershed management, wasteland reclamation, Environmental Issues. Concept of sustainable development.

UNIT-2 Elements of Landscape architecture and Landscape Design 10

Elements of landscape – land elements, land form plants and planting, water, lighting etc. characteristics and classification of plant materials, basic principles of landscape design; Factors to be considered, Use and application of plant materials in landscape design, and other components involved

UNIT-3 History of landscape architecture 10

Development of landscape design: Detailed study of selected examples from Eastern, Central and Western traditions; Ancient Heritage - Mesopotamia, Egypt, Greece, Rome; Western Civilization – Europe: Italy, France, and England; The middle-east - The Persian tradition and its far reaching influence Eastern Civilisation: China and Japan Ancient and medieval period in India; Mughal and Rajput Landscapes and study of contemporary landscape architecture

UNIT-4 Urban Landscape 10

Basic principles and elements of Urban landscape, Significance of landscape in urban areas, introduction to street furniture, road landscaping, waterfront development, landscaping of residential areas, Industrial Landscaping.

UNIT-5 Landscape Exercise **20**

Landscape design of a neighborhood open space (area of 2000 to 3000 sq. metres)

TOTAL 60

TEXT BOOKS

- Michael Laurie, An Introduction to Landscape Architecture, Elsevier, 1986
- Geoffrey And Susan Jellicoe, The Landscape of Man, Thames And Hudson, 1987

REFERENCE BOOKS

1. T S S for Landscape Architecture, Mc Graw Hill,Inc, 1995
2. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company, 1993
3. Brian Hacket, Planting Design
4. T.K. Bose and Chowdhury, Tropical Garden Plants in Colour, Horticulture And Allied Publishers,Calcutta, 1991
5. Motloch, J.L.,Introduction to Landscape Design", Van Nostrand Reinhold Publishing Co., New York, 1991.
6. Bring, M, "Japanese Gardens: "design & Meaning
7. Simonds, J.O., "Earthscape: A Manual of Environmental planning", McGraw Hill Book Co., New York, 1978.
8. Motloch, J.L., "Introduction to Landscape Design", Van Nostrand Reinhold Publishing Co., New York, 1991.., McGraw Hill Book Co., New York, 1981.

		L	T	P	C
ARC 409	**ARCHITECTURAL DESIGN STUDIO-VI**	**0**	**0**	**16**	**8**
	Prerequisite				
	Nil				

Architectural images and languages de-structured & reassembled - This Design studio attempts to first foster an understanding of conventional images & spatial language of certain building types and then encourages the student to de-structure it and reassemble the same to get a completely new interpretation. Innovation & experimentation with regard to form / space and lines / patterns will be encouraged.

- **Design for travel & Sports** – Contemporary transportation terminals and stadiums are large buildings with multiple entries & exits dealing with large crowds and having multiple levels with large spans, complex services & demanding environmental conditions. Function, convenience and security will become the basic design parameters. Ex. Bus terminal / Railway station / Indoor sports complex / Aquatic complex etc. **120**
- **Design as a narrative & spatial syntax –** This design exercise requires students to design large complex buildings as a spatial narrative that draws analogies from our epics, myths and narrative past. Spatial sequences can be structured similar to events, episodes and the overall theme found in these narrations. Interior spatial morphology that is expressive of unconventional ideas will be encouraged. Ex. Resort hotel / Boutique hotel / Museum / Art gallery / Cultural center etc

120

TOTAL 240

REFERENCE BOOKS

1. *Time saver standards for building types*, DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect's data,* Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd
3. National Building Code - ISI
4. *New Metric Handbook* – Patricia Tutt and David Adler – The Architectural Press

VIII SEMESTER

		L	T	P	C
ARC 402	**PROFESSIONAL PRACTICE**	**3**	**0**	**0**	**3**

	Prerequisite				
	Nil				

PURPOSE

To expose the students to the various problems and issues encountered in the normal course of architectural practice & teach them the methods of legal redressal.

INSTRUCTIONAL OBJECTIVES

To develop understanding of the duties and liabilities of an architect along with knowledge of bye-laws that relate to the building & the environment in the Indian context.

UNIT-1 THE PROFESSIONAL ROLE OF AN ARCHITECT & SERVICES RENDERED 9

Architect's role in society, IIA code of conduct, salient features of **architect's act 1972**, the council of architecture – Management of an architects office, elementary accountancy required for the same etc.

Architectural services- conditions of agreement- scope of work, comprehensive architectural services and architectural competitions, conditions of engagement, remuneration, professional fees and charges as per IIA norms.

UNIT-2 ARCHITECTURAL COMPETITIONS & LEGISLATIONS 12

Regulations governing the **conduct of competitions**, open & closed competitions, appointment & duties of Assessors, instructions to participants, award of premium.

Role of development authorities & urban arts commissions, salient features of the DCR for CMA**, important regulations** in the Tamilnadu cinema rules,1973 & the TN factory rules,1950,- Environmental acts & laws, special rules governing hill area development & coastal area management, heritage act of India etc.

UNIT-3 EASEMENTS & ARBITRATION 6

Definition, types of **Easements**, acquisition, protection and extinction of easements – Need for **Arbitration**, arbitration agreement, role of arbitrators, umpire etc, excepted matters, arbitral award.

UNIT-4 TENDER & CONTRACT 10

Calling for **Tenders,** tender documents, open & closed tenders, various types such as item rate, lump sum, labour & demolition tenders, conditions of tender, submission, scrutiny, recommendations & award of contract.

Conditions of contract, IIA form of contract, articles of agreement, certification of contractors bills, defects liability .

UNIT-5 VALUATION & RENT 8

Valuation – purpose of valuation, types of valuation- book value – salvage value- scrap value- depreciation- obsolescence- sinking fund- land valuation- mortgage and lease- problems on valuation- Annuity- definition, Fixation of rent- out going- gross and net income – year's purchase- capital cost-standard rent- market rent- economical rent.

TOTAL 45

TEXT BOOK

1. R H..Namavati, Professional practice, 7th ed,lakshmi book depot, mumbai,1997.

REFERENCE BOOKS

1. Hand book on Professional Practice by I. I. A, Image systems, Mumbai,1998.
2. *Estimating and Costing* by Dutta
3. *CMDA-Development control rules* for CMA.
4. *TN cinematograph manual*, govt central press, Chennai,1998.
5. *Environmental Acts* of the Ministry of Environment & forests, GoI.

ARC 404	**ARCHITECTURAL CONSERVATION**	**L**	**T**	**P**	**C**
	Prerequisite	**3**	**0**	**0**	**3**
	Nil				

PURPOSE

To develop understanding about the importance of historical and heritage buildings

INSTRUCTIONAL OBJECTIVES
Knowledge about the various techniques of conservation in architecture and the development of the commitment to conserve old buildings of cultural importance

UNIT-1 INTRODUCTION **6**
Definition of conservation, Need for conservational activities, brief study in India and abroad, **Role of architect** in conservation program.

UNIT-2 HISTORY **12**
Origin and evolution of conservational programs, survey and studies required - methodology and implementation.

UNIT-3 COMMUNITY PARTICIPATION **9**
Social, cultural, historical and economical values of Conservational projects, **involvement of community**. Conflict and compatibility between conservation and development - the need to strike a balance

UNIT-4 CASE STUDIES OF CONSERVATION PROGRAMS **12**
Case studies of conservation programs which are successful by government and non-governmental agencies.

UNIT-5 RULES AND REGULATIONS **6**
Rules and regulation, administrative aspects, new concepts in conservation

TOTAL 45

REFERENCE BOOKS

1. Bernard Fielder (INTACH), Guide to Conservation
2. *Conservation of European* Towns
3. Peter Marston – The book of the *Conservation* – Orion House, London

		L	T	P	C
ARC 406	**HOUSING**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE
To create awareness about the causes and consequences of housing problems and to impart knowledge about the possible solutions.

INSTRUCTIONAL OBJECTIVES
Understanding of the various issues involved in urban and rural housing and knowledge about the planning and design solutions for low income groups.

UNIT-1 INTRODUCTION TO HOUSING AND HOUSING ISSUES **5**
Housing demand and need. Calculation of future need. National housing policy of 2007, Housing agencies, housing resources, Role of banks in housing finance.

UNIT-2 SOCIO ECONOMIC ASPECTS **5**
Social factors influencing Housing Design – identity, safety, convenience, access, amenities etc , economic factors - affordability and its relationship to house income , incremental housing concept , Slum Upgrading and sites and services schemes.

UNIT-3 Housing standards **7**
Different types of housing standards – spatial standards, safety standards, standards for amenities, Methodology of formulating standards, UD PFI – guide lines, standard and regulations – DCR – performance standards for housing, TCPO , New norms and amenities

UNIT-4 Modern Techniques in housing construction **5**

Prefabrication techniques –modular house, panelized and precast homes, sustainable practices – zero energy home, eco friendly home, green homes - Teri – Griha and its rating system.

UNIT-5 Housing design and process **8**

Traditional housing, row housing, cluster housing – apartments and high-rise housing, gated community, Government housing – HUDCO financed project for economically weaker section. .Their Advantages and disadvantages. Methods and approaches to housing design. Various stages and tasks in project development – feasibility study, detailed study.

TOTAL 30

REFERENCE BOOKS

1. Babur Mumtaz and Patweikly, *Urban Housing Strategies*, Pitman Publishing, London, 1976.
2. Geofrey K.Payne, *Low Income Housing in the Development World*, John Wiley and Sons, Chichester, 1984.
3. John F.C.Turner, *Housing by people*, Marison Boyars, London, 1976.
4. Martin Evans, *Housing, Climate and Ocmfort, Architectural* Press, London, 1980.
5. *Forbes Davidson and Geoff Payn*e, Urban Projects Manual, Liverpool University Press, Liverpool, 1983

		L	T	P	C
ARC 408	**TOWN PLANNING& HUMAN SETTLEMENTS**	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

To develop an appreciation of the planning issues involved at the scale of a town or a city.

INSTRUCTIONAL OBJECTIVES

To expose the students to the history and development of planning, its relevance & application to modern day principles of town planning.

UNIT-1 PRINCIPLES AND PROCESS OF PLANNING **12**

Types of planning, town and its land uses, character of a town, categories of a town, densities of a town, zoning, Planning process, Classification of settlement based on form, use, scale etc.
Development plans- Regional planning, Structure plan, Development plan, Annual plan, Action plan, Master Plan- Definition, objectives of master plan, contents of master plan, preparation and implementation of master plan

UNIT-2 HUMAN SETTLEMENTS **6**

Introduction to human settlements, growth and decay of human settlements, influence of socio-economic factors in the development of human settlements, urbanisation trend in India, planning standards

UNIT-3 EVOLUTION OF SETTLEMENT DESIGN **9**

Overview of evolution of settlement design from the River Valley to Pre-Industrial (17^{th} century) towns with emphasis on the factors that influenced Town Planning principles and theories - Indus valley civilization - Mohenjodaro, Harappa, Extracts from Chanakya's Arthasastra, manasara's Vastushastra, planning thought behind Fatehpur sikhri, Shahjahanabad, Jaipur etc.

UNIT-4 CONTEMPORARY CONCEPTS IN TOWN PLANNING **9**

Role and contribution of the following towards contemporary town planning thought - Patrick Geddes, Patric Abercrombie, Daniel Burnham, Soria Y Mata, Frederick Olmstead, Henry Wright, Ebenezer Howard, Clarence Perry, Clearance stein, CA Doxiadis, Le Corbusier, Frank Lloyd Wright

UNIT-5 NEW HORIZONS **9**

Rebuilding our cities – penalty for neglect, Urban renewal, Necessity and Advantages of urban renewal- various steps in urban renewal programme
New utopians – the search for space – the search for form – density equation

TOTAL 45

TEXT BOOK

1. Text book of *Town Planning*, A.Bandopadhyay, Books and Allied, Calcutta 2000

REFERENCE BOOKS

1. John Ratcliffe, *An Introduction to Town and Country Planning*, Hutchinson 1981
2. Arthur B. Gallion and Simon Eisner, The Urban Pattern – *City planning and Design*, Van Nostrand Reinhold company
3. Rangwala, *Town Planning*, Charotar publishing house
4. G.K.Hiraskar, *Town Planning*
5. Rame Gowda, *Urban and Regional planning*
6. S.K.Khanna, *Highway Engineering*, C.E.G. Jhusto, Nemchand & Bros. Roorkee 1997
7. N.V.Modak, V.N.Ambedkar, *Town and country planning and Housing,* orient longman, 1971

		L	T	P	C
AR0410	**ARCHITECTURAL DESIGN STUDIO-VII**	**0**	**0**	**16**	**8**
	Prerequisite				
	Nil				

Creation of new Paradigms in architectural design – This Design studio addresses predominantly urban issues such as Housing, Urban design and Conservation. Though emphasis is on the study of existing problems in our cities, scholars will be encouraged to strive for innovative architectural solutions for the same. Team work will be required to undertake such projects & hence the ability of the student as a team player will be critical.

- **Housing** – The various types of housing projects in a typical urban scenario can be taken with suitable design parameters that get established after conducting a rigorous study. Analysis of existing design trends & user preferences need to be ascertained. Awareness about special building byelaws applicable for Group housing schemes is essential. In addition to design issues such as security, accessibility, identity, social interaction, comfort, economy etc that would be investigated, the application of Fractals in design can also be explored. Ex. Housing for the poor / Slum dwellers, Multi-storeyed apartments for Govt. / corporate employees, Multi-storeyed condominiums for the rich etc.

  120

- **Urban design or Conservation** – Urban design projects could deal with redevelopment of problem areas such as riverfronts, beach fronts, market areas, bazaars or commercial & residential districts that have reached dead end situation. It could also deal with emerging nodes of transportation with its surrounding areas, the design of city level open spaces such as parks, plazas etc.

  Alternatively, conservation strategies for heritage areas along with revitalization techniques can also be attempted. The projects thus undertaken as group work will have to ultimately contribute ideas for the improvement of the quality of the urban environment. Ex. George town, Poonamalee, Panangal park, Mylapore, Tambaram, Marina, Cooum riverfront, Elliots beach, Ambattur, Harbour area, Island grounds, Santhome beach, Congress grounds, Adyar riverfront etc.

  120

TOTAL 240

REFERENCE BOOKS

1. *Time saver standards for building types*,DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect's data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd
3. National Building Code - ISI
4. *New Metric Handbook* – Patricia Tutt and David Adler – The Architectural Press
5. *Time saver standards for landscape architecture* – Charles W.Harris – McGraw Hill

IX SEMESTER

		L	T	P	C

ARC 501	**PROFESSIONAL TRAINING**	**0**	**0**	**0**	**6**
ARC 503	**DOCUMENTATION**	**0**	**0**	**0**	**2**
	TOTAL	0	0	0	**8**

X SEMESTER

		L	**T**	**P**	**C**
ARC 504A	**THESIS PROJECT**	**0**	**0**	**0**	**13**
	TOTAL	**0**	0	0	**13**

ELECTIVES

		L	**T**	**P**	**C**
ARC 351	**SET DESIGN**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To create awareness and provide exposure about the design potential in theatre and cinema set design to architecture students .

INSTRUCTIONAL OBJECTIVES

To inculcate the ability to translate the requirements of the script to physical manifestations according to the traditions followed in the theatre and cinema industry.

UNIT-1 FILM AND SOCIETY **6**

Examination of the twentieth-century culture and society through film. Critical analysis of cultural and social conflicts are portrayed and worked out in popular films, and examination of how motion pictures create a window into modern society. Film as cultural texts to better understand history and culture manifestations.

UNIT-2 HISTORY AND THEATER FILM SET DESIGN **6**

Investigation the production methods, dramatic theory and conventions, and scene design of various performance media since the popularization of the motion picture, and how it has influenced all entertainment design in the 20th and 21st centuries.

UNIT-3 GRAPHIC DESIGN AND TYPOGRAPHY FOR EXHIBIT DESIGN **6**

Principles of layout for creating effective visual signage and explore the unique problems, technique, theory, and approaches of signage in film, theatre, and other forms of mediated exhibition.Introduction to the design applications for building signage.

UNIT-4 SET DESIGN AND CONCEPT WRAP **6**

Introduction to the basic concepts, through theory and practice, of scene design in theatre, film, and other fine arts and entertainment media. Students will learn how to analyze scripts for proper scenery, how to conceptualize designs that will translate into actual sets, and develop visual thinking within the creative process.

UNIT-5 STAGE DESIGN **6**

Stage design process from inception to performance, script analysis, visual arts analysis, research skills, and the application of principles and elements of design. Understanding stage setting through language, color, and architectural analysis.

TOTAL 30

REFERENCE BOOKS

1. *Time saver standards for building types*,DeChiara and Callender, Mc Graw hill company
2. *Neufert Architect's data*, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd

		L	T	P	C
ARC 353	**VERNACULAR ARCHITECTURE AND SETTLEMENTS**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To expose the students to traditional architecture of the various parts of the country.

UNIT-1 INSTRUCTIONAL OBJECTIVES **6**

The students will have knowledge of the planning aspects, materials used in construction, constructional details and settlement planning of the settlements in various parts of the country.

UNIT-2 INTRODUCTION TO VERNACULAR ARCHITECTURE **4**

Approaches and concepts to the **study of Vernacular architecture** – Introduction to Kutcha architecture and Pucca architecture

UNIT-3 DRAVIDIAN SOUTH **8**

Planning aspects, materials of construction, **Constructional details & Settlement Planning** of

- Kerala – Nair houses(Tarawads), Kerala Muslim houses(Mappilah houses), Temples, Palaces and theaters – Thattchushastra.
- TamilNadu – Toda Huts, Chettinad Houses (Chettiars) & Palaces
- Karnataka – Gutthu houses (land owning community), Kodava ancestral home (Aynmane)
- Andhra Pradesh –Kaccha buildings

  Religious practices, beliefs, culture & climatic factors influencing the planning of the above.

UNIT-4 WESTERN REGION **6**

Planning aspects, Materials used, Constructional details, Climatic factors influencing the planning of

- Jat houses for farming caste, Bhungas(Circular Huts) and Havelis(Pukka houses) of Rajasthan
- Pol houses of Ahmedabad - Primitive forms, Symbolism, Colour, Folk art etc in the architecture of the deserts of Kutch & Gujarat state.
- Vernacular architecture of Goa.

UNIT-5 NORTHERN AND EASTERN INDIA **6**

- Kashmir – Typical Kutcha houses, mosque, Dhoongas(Boathouses), Ladakhi houses, bridges
- Himachal Pradesh – Kinnaur houses
- Uttar Pradesh – Domestic housing of Uttar Pradesh
- Bengal – Bangla (Rural house form), Aat Chala houses – change from Bangla to Bungalow, Kutcha & Pucca architecture of Bengal.Nagaland – Naga houses & Naga village, Khasi houses
  Factors influencing the planning aspects, materials of construction & constructional details of the above.

TOTAL 30

TEXT BOOKS

1. *Traditional buildings of India*, Ilay Cooper, Thames and Hudson Ltd., London

REFERENCE BOOKS

1. *Architecture of the Indian desert*, Kulbushan Jain & Meenakshi Jain, Aadi Centre, Ahmedabad
2. *The Royal Palaces of India*, George Michell, Thames and Hudson Ltd., London
3. Chettiar Heritage, S.Muthiah, Meenakshi Meyappan, Visalakshmi RAMASWAMY, Lokavani-Hallmark Press Pvt. Ltd., Chennai
4. Encyclopaedia of *Vernacular architecture of the World*, Cambridge University Press
5. Havali – *Wooden houses & mansions of Gujarat*, V.S.Pramar, Mapin Publishing Pvt. Ltd., Ahmedabad
6. The Tradition of Indian architecture – *Continuity & Controversy* – Change since 1850, G.H.R.Tillotsum, Oxford University Press, Delhi
7. *VISTARA – The architecture of India*, Carmen Kagal. Pub : The Festival of India, 1986.
8. *House, Form & Culture*, Amos Rappoport, Prentice Hall Inc, 1969.

		L	T	P	C
ARC 352	**APPLIED ERGONOMICS**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To expose the students to the requirements of designing for the human comfort in accordance with anthropometry.

INSTRUCTIONAL OBJECTIVES

The students will have knowledge of ergonomics and its applications in design including designing for the handicapped and the elderly.

UNIT-1 INTRODUCTION TO HUMAN FUNCTION **6**

Human being in the man made world and importance of ergonomics, Gross human anatomy , Ergonomics for children - at workplace old people

UNIT-2 ERGONOMICS AND DESIGN **6**

Introduction to Anthropometrics – static and dynamic, Muscles and work physiology, Static and Dynamic work including maximum capacity

UNIT-3 DISABILITY, AGEING AND INCLUSIVE DESIGN **6**

Built environment for the physically handicapped – Ramp, toilets and corridor design, Spatial Requirements for wheel chair movement-Design issues in the design of old age homes – Criteria to be considered when designing for the blind

UNIT-4 ENVIRONMENTAL ERGONOMICS **6**

Biomechanics, Environmental Condition including, thermal, illumination, noise and vibration, Bio transducers and ner5rvous system including their limitations

UNIT-5 HEALTH EFFECTS OF ENVIRONMENTAL STRESSORS **6**

Controls and Displays- psycho psychological aspects of Design- Occupational hazards in work environment – Visual stress – Postural Stress – Stress due to commuting

TOTAL 30

TEXT BOOKS

1. De Chiara and Callender - Time Savers Standards for Building Types
2. De Chiara and Callender - Time Savers Standards for Architectural data

		L	T	P	C
ARC 354	**ARCHITECTURAL PHOTOGRAPHY & JOURNALISM**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

UNIT-1 INTRODUCTION TO PHOTOGRAPHY **4**

General introduction to the art of photography; ; concept of color; concepts of lighting, distance, visual angle, frames; media;

UNIT-2 PHOTOGRAPHIC TECHNIQUES **6**

Types of camera, properties and priorities; Exposure, Aperture, Speed; Photographic films, Film processing-color, black and white, printing techniques, developing.

UNIT-3 JOURNALISM **8**

Analysis of recent historical and contemporary examples of written and journalistic criticism of architecture, including selected writings by Indian and overseas critics; discursive techniques, analysis of major critical themes, thematic categories in architectural writing over the past three centuries.

UNIT-4 ANALYSIS OF WORKS **6**

Works of Indian and international writers and critics will be presented and discussed. Seminars on Indian architectural writers, journalists and critics

UNIT-5 FIELD PROGRAM **6**

Exercise on integrating photography in architectural journalism.

TOTAL 30

TEXT BOOKS

1. Dave Sounders, *Professional Advertising Photography*, Merchurst, London 1988
2. Roger Hicks, *Practical photography*, Cassell, London 1996

REFERENCE BOOKS

1. Julian Calder and john Garrett, *The 35mm Photographer's* Handbook, Pan Books, London 1999
2. Julie Adair King, *Digital Photography for Dummies*, COMDEX, New Delhi 1998

		L	T	P	C
ARC 451	**ENVIRONMENTAL PLANNING**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

Understanding the impact of man's activities on the environment & knowledge about the methods to ameliorate the negative impacts.

INSTRUCTIONAL OBJECTIVES

To know the methods of assessing impact on the environment, the legislations and mitigation methods.

UNIT-1 RESOURCES **8**

Man, biosphere, ecosystems, resource identification and its implications for development -soil, water, land, plants, animals, renewable energy and non renewable energy. Preparation and analysis of resource inventories.

UNIT-2 ENVIRONMENTAL IMPACT ASSESSMENT **4**

Methodologies and techniques

UNIT-3 ENVIRONMENTAL LEGISLATION **6**

Significance of law and its relationship to development, evolution of planning legislation. National environmental policy.

UNIT-4 PLANNING TECHNIQUES **8**

Essence of good planning, integration of environmental assessment and planning options, Priorities and strategies for development on urban, coastal and hilly ecosystems.

UNIT-5 EVALUATION TECHNIQUES **4**

Cost benefit analysis, planning balance sheet and goal achievement matrix.

TOTAL 30

TEXT BOOKS

1. Earthscape - A Manual of *Environmental Planning and Design*, John Ormsbee Simond, Van Nostrand Reinhold Company 1978

REFERENCE BOOKS

1. Richard P. Dober – *Environmental Design* – VNR company - New York, 1969
2. Albert J. Rutledge – *Anatomy of a park* – Mc Graw Hill book Co., - USA 1971
3. Harvey M. Rubenstein – *A guide to Site and Environmental planning, 3rd vol.* – John Wiley & sons – New York, 1987

		L	T	P	C
ARC 453	**URBAN ECONOMICS & SOCIOLOGY**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To make the students aware that economics and sociology are integral parts of architectural consideration.

INSTRUCTIONAL OBJECTIVES

To expose the students to the various social issues and economic concepts that come with in the purview of architecture.

UNIT-1 GENERAL ECONOMICS **4**

Subject matter of Economics, relevant economic theories to urban economics.

UNIT-2 URBAN ECONOMICS **6**

Definition of Urban Economics – the reasons for the existence of cities – Factors influencing urbanization – Market Demand and Supply – Choice of Technique in production – Laws of returns governing production.

UNIT-3 LAND AND BUILDING ECONOMICS **8**

Costs Study – Urbanization and Planning – Urban land values – Land utilisation pattern and planning – Housing

analysis – Public housing with particular reference to Tamil Nadu – Urban problem – Poverty, Migration, Unemployment, Pollution.

UNIT-4 RELEVANCE OF SOCIOLOGY **4**

Definition and theories and their relevance to social set-up- Social structure – Organization – Social Institutions and Social Change.

UNIT-5 SOCIAL PROBLEMS AND PROGRAMMES **8**

Urban Society – Social and economic problems – Rural society: Social and economic problems.
Developmental programmes related to urban and rural society – Impact of programmes on social development.

TOTAL 30

REFERENCE BOOKS

1. Warner Z.Hirsch, *Urban Economics*, Macmillan, New York, 1984.
2. Gopal Bhargava, *Urban problems and policy perspectives*, Abinav publication, New Delhi, 1981.
3. Muttalib, Akbar Alikhan, *Public Housing*, Sterling Publishers, New Delhi, 1986.
4. Prakasa Rao, VLS, Urbanisation in India, Concept Publishing Company, New Delhi, 1983.
5. A.R.Desai, *Rural Sociology*, Popular Prakashan, Bombay, 1984.
6. Neil J.Smelsa, *Sociology*, Prentice Hall, New Jersey, 1981.

		L	T	P	C
ARC 455	**FURNITURE DESIGN & PRODUCT DESIGN**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

Knowledge about the various styles of furniture manufactured in various materials is vital to an architect.

INSTRUCTIONAL OBJECTIVES

Understanding the methods and techniques involved in furniture and product design.

UNIT-1 INTRODUCTION **6**

An brief introduction to Product Designing – Various elements – History of Product Design – Definition of Product Design, understanding of Product Design - Purpose of Product Design – Role of Product Designers.

UNIT-2 HUMAN FACTORS **6**

Definition of human factors, Application of human factors data. Human activities, their nature and effects.
Man-machine system and physical environment. Human performance and system reliability.
Information input and processing. Human control systems. Applied anthropometry – Human response to climate.

UNIT-3 ASPECTS OF PRODUCT DESIGN **6**

Visual, Auditory, Tactual, Olfactory human mechanisms, Physical space and arrangement. Visual display, process of seeing, visual discrimination, quantitative and qualitative visual display, Alphanumeric and related displays , Visual codes and symbols.

UNIT-4 PRODUCT DESIGN **6**

Form, Colour, Symbols, User specific criteria, Material, Technology and recyclability, Packaging. Multiple Utility oriented approach to Product Design.

UNIT-5 DESIGN EXERCISES **6**

Design of Household elements, tools and devices – Spoon/Cutlery.
Design of furniture – Chairs/Computer table, Kitchen racks, Cabinets etc.
Design of Industrial Product – Watch Dial, Gear Wheels, Automobile Headlights etc.
Element design for the physically and mentally different people.

TOTAL 30

REFERENCE BOOKS

1.*Time Saver Standards for Interior Design*
2.Andrew Alpern, Handbook of *Speciality Elements in Architecture*, McGrawhill Co., USA, 1982.
3.Francis D.K.Ching, *Interior Design Illustrated*, VNR Publications, New York, 1987.
4.*An invitation to Design*, Helen Marie Evans.

		L	T	P	C
ARC 457	**BEHAVIORAL ARCHITECTURE**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE

To impart knowledge about this relatively new field, born out of the synthesis between architecture and behavioral psychology.

OBJECTIVE

Understanding of the multiplicity of living patterns, activities, geometric patterns in space and designing for the same.
Knowledge about the behavioral design process, techniques and design contexts.

UNIT-1 INTRODUCTION TO BEHAVIORAL ARCHITECTURE **4**

Designing for pattern and activities – Archetypal activities / Archetypal spaces - planning of public spaces with reference to age groups and activities.

UNIT-2 BUILDING SYSTEMS **6**

Room use – geometry & meaning – hidden behavioral assumptions – adjacencies – vertical bypass & horizontal bypass - various stages in the design of building subsystems

UNIT-3 BUILDING – BEHAVIORAL INTERFACE **6**

Geometry of spaces, their meaning & connotations – Social organization of buildings – Behavioral assumptions in the planning of new towns and neighborhoods – borrowed space.

UNIT-4 BEHAVIORAL DESIGN **8**

Process organization chart – affinity matrices, pictograms – behavioral design process model – design context – activity / adjacency relationship – evaluation chart – Area use frequency program – simultaneous use - community utilization map, occupancy load profile – defensible space, EDRA etc.,

UNIT-5 URBAN ENVIRONMENT **6**

Patterns of activity in time and space – the ecology of a neighborhood park and playground – cross cultural issues – social & psychological issues in the planning of new towns – environmental perceptions and migration – awareness and sensitivity to open spaces – environmental cognition.

TOTAL 30

REFERENCE BOOKS

1. Clovis Heimsath – Behavioral architecture – Mc graw hill, 1977
2. David canter & Terence lee – Psychology and the built environment – Halstead press , New York, 1974.
3. Charles Burnette – Architecture for human behavior: collected papers from a mini conference – Philadelphia chapter of AIA, 1971.
4. Christopher Alexander et al. – A pattern language – Oxford university press ,
5. New York, 1977.
6. Kevin Lynch – The image of a city – Cambridge MIT, 1973.

		L	T	P	C
ARC 452	**ADVANCED STRUCTURES**	**2**	**0**	**0**	**2**

	Prerequisite				
	Nil				

PURPOSE

- To inculcate the basic concepts of pre stressing.
- To familiarize the students with the tall building structural system and various types of shells and folded plates.
- To introduce the basic concepts of Space Frames, Shells and folded plates and Tensile structures

INSTRUCTIONAL OBJECTIVES

By the end of the course the student shall be capable of designing Shells and Space Frames. He shall be in a position to appreciate the difference between RCC and pre stressed concrete. Further he shall have sufficient knowledge to design pile foundations and suggest appropriate tall structural systems, shells and folded plates and tensile structure for the space coverage.

UNIT-1 DEEP FOUNDATIONS **6**

Soil Exploration Studies - **Pile foundations** – Types of pile foundation – Construction techniques – Design of end bearing piles – Design of under reamed pile foundation for apartment buildings as per National building code – Pile caps – Design as per hand books.

UNIT-2 PRE STRESSED CONCRETE **6**

Introduction to pre stressed concrete – Pre stressed concrete materials – Methods of pre stressing - Analysis and approximate design of determinate beams - losses of prestressing - Comparison between RCC and pre stressed concrete.

UNIT-3 TALL BUILDINGS **6**

Tall buildings structural systems – Rigid frames – Braced frames – Shear wall – Buildings – Wall frame buildings – Tubular buildings – Tube-in tube buildings – Outrigger braced system – Brief outline of their behaviour and their applicability for various heights of buildings.

UNIT-4 SHELLS AND FOLDED PLATES **6**

Shells – Types – Classification as per BIS – Stress resultants – Relative merits and applicability. Folded plates – Types – Comparison with shells – Applicability. Arches – Basic concepts – Analysis of three hinged arches.

UNIT-5 SPECIAL STRUCTURES **6**

Definitions, Types – single, double & multilayered grids – two way & three way space grids, connectors, Grids – Domes - various forms - Geodesic domes, Suspended cable structures – types of cable network systems, shapes of cable suspended systems, examples of tensile membrane structures – types of pneumatic structures.

TOTAL 30

TEXTBOOKS

1. Sinha .N.C and Roy .S.K, *Fundamentals of Reinforced Concrete*, S.Chand & Co. Ltd., New Delhi, 2001
2. Ramamrutham .S and Narayanan .R, *Reinforced Concrete Structures*, Dhanpat Rai Publications, New Delhi, 1997
3. Bryan Stafford and Alex Coull, *Tall Building Structures, Analysis and Design* John Wiley & Sons, New York, 1991

REFERENCE BOOKS

1. Bandyopadhyay .J.N, Thin Shell *Structures Classical and Modern Analysis*, New Age International Publishers, New Delhi, 1998
2. Ramaswamy .G.S, *Design of Construction of Concrete* Shell Roofs, McGraw Hill Publishing Company, New York, 1986
3. Krishna Raju .N, *Pre Stressed Concrete*, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1988
4. Taranath .B.S, *Structural Analysis and Design of Tall Buildings*, McGraw Hill, New York, 1988.
5. Purushothaman .P, *Reinforced Concrete Structural Elements*, Tata McGraw Hill Publishing Co Ltd., New Delhi, 1984.

		L	T	P	C
ARC 454	**INDUSTRIAL BUILDING SYSTEMS**	**2**	**0**	**0**	**2**
	Prerequisite				

	Nil				

PURPOSE
To impart knowledge about the necessity and techniques of pre fabricated building components used for housing.
INSTRUCTIONAL OBJECTIVES
To create awareness about the various types of pre fabricated housing systems and to recognize the importance of modular coordination in industrialised building systems.

UNIT-1 INTRODUCTION **6**
Five year plans and thrust in housing – Issues in Urban Housing – use of modern building materials – application of modern technology – meaning of industrial building system.

UNIT-2 APPLICATION OF INDUSTRIAL BUILDING SYSTEM **6**
Feasibility of using industrial building system in Residential and Non-Residential buildings – manufacturing of building components – Technology requirements for industrial building system – use of Industrial building system as an option for disaster mitigation.

UNIT-3 MODULAR CO-ORDINATION AND INDUSTRIALISED SYSYEM **6**
Concept and definition of Modular dimensional discipline – Advantages and Limitations of modular principle – Components of residential buildings – precast elements.

UNIT-4 PRE-FABRICATION SYSTEM **6**
Objective and necessity – Off site on site prefabrication elements and construction joints – architectural and technical limitations.

UNIT-5 PROCEDURES AND ORGANISATION **6**
Equipments used – manufacturing processes – transportation of components – assembly and finishing – Structural, social and economic issues related to industrial building system.

TOTAL: 30

REFERENCES:
1. Industrial Building and Modular Design Henrik Missen – C & CK, UK 1972.
2. Albert G.H.Dietz, Laurence Secotter – “Industrialized Building Systems for Housing” – MIT, special summer session, 1970 USA.
3. “Industrialized Building Construction” – Proceedings of National Seminar, Nov-17-18, 2000, Indian Concrete Institute, Mumbai.
4. “Innovative Construction Materials” – Proceedings of Seminar, Jan 20-21,2001, Veermata Jeejabai Technical Institute, Mumbai.

		L	T	P	C
ARC 456	**SERVICES IN TALL BUILDINGS**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE
To impart knowledge about the special service requirements of tall buildings and to create awareness about the systems, equipment and materials that are commonly employed in high rise buildings.

OBJECTIVES
Understanding the special systems required in mechanical, electrical and Fire safety services.

The ability to design vertical transportation systems, HVAC systems and Fire protection systems in line with the various standards, building codes and safety requirements.

UNIT-1 VERTICAL TRANSPORTATION **8**
Introduction to passenger elevator codes – Express & Local Elevators, Sky lobbies etc., - Study of elevator equipments, control systems and spatial requirements – Escalators and Capsule elevators – Stairways & Ramps

UNIT-2 FIRE PROTECTION **6**

Designing for fire safety – NBC – Fire alarm systems – Smoke detectors – Fire fighting support systems – Fire rating of materials - Fire escape stairs & Safety regulations – Lightning protection.

UNIT-3 THERMAL CONTROL SYSTEMS **8**

Calculation of Heating and Cooling loads – Selection of suitable HVAC system – Special equipments and systems for heating and cooling – Spatial requirements for HVAC plants – Design of duct layouts etc.,

UNIT-4 WATER SUPPLY AND SEWAGE DISPOSAL **4**

Basic planning for water supply – Calculation of capacity for sumps and water tanks -–Skip stage pumping etc., - Rainwater harvesting methods – Sanitation arrangements in high rise structures – Service floors – Ducts and vertical shafts – Waste treatment etc.,

UNIT-5 ELECTRICAL SYSTEMS **4**

Planning transformer & generator rooms, Preparation of electrical layouts for tall buildings – Spatial requirements of electrical rooms and ducts – Intelligent systems for electrical and illumination.

TOTAL 30

TEXT BOOKS

1.Stein Reynolds Mc Guinness – *Mechanical and Electrical equipment for buildings – vol 1 & 2* – John Wiley & sons

REFERENCE BOOKS

1.Francisco Asensio Cerver – *The architecture of Skyscrapers* – Hearst Book International - New York, 1997
2.Bennetts Ian & others – *Tall building structural systems*
3.Proceedings of the council for tall buildings – vol 1 & 2

		L	T	P	C
ARC 458	**SUSTAINABLE BUILDING DESIGN**	**2**	**0**	**0**	**2**
	Prerequisite				
	Nil				

PURPOSE:

To introduce the students to the theoretical and practical aspects of sustainable design and the various technologies involved in executing them.

INSTRUCTIONAL OBJECTIVES:

- To equip the students with various tools of sustainable design such as design methodology, resource optimization and innovative approaches to eco-design.
- To familiarize the student with some of the acclaimed sustainable buildings designed within the past decade.

UNIT-1 SUSTAINABLE DESIGN METHODS & MATERAIL OPTIMIZATION **6**

Sustainable design strategies and approaches, Sustainable design innovation, Systems design, Trans-disciplinary collaboration in design, Life cycle design and life cycle assessment (LCA), Design for disassembly, Design for re-use, Design for sustainable manufacturing and construction, Design for remanufacturing.

UNIT-2 ENVIRONMENTAL & SOCIAL CONSIDERATIONS **6**

Design for environment**,** Land use planning; smart growth and urban design; transportation policy and design; environmental site design; site assessment and selection; Brownfield redevelopment strategies and infill development**,** Eco-design**.** Socially responsible design, User-centered design, Design education and sustainability, Design ethics and sustainability**.**

UNIT-3 ENERGY & WATER USAGE OPTIMZATION **6**

Optimizing Energy performance & Designing with renewable and alternative energy systems including solar power, wind, geothermal, low-impact hydroelectric, photovoltaic, biomass & biogas with a view to achieving energy efficiency. Understanding water use/ demand, water conservation, water quality and biological methods of wastewater treatment, use of recycled water and storm water drainage as they relate to the planning and design of

urban communities and project sites. Planning and design for natural and impacted on-site water features. Fundamental water resources policy issues and hydrologic processes, as they apply to community planning and design situations.

UNIT-4 BIOMIMETICS **4**

Definition, Replicating natural manufacturing methods as in the production of chemical compounds by plants and animals; Mimicking mechanisms found in nature, Imitating organizational principles from social behavior of organisms; Examples: Spider-silk as a substitute for steel, Lotus effect in self-cleansing glass, Dinosaur spine in bridge design, Lily pad structure, termite mound cooling system, swarm theory, aerodynamic structures etc.

UNIT-5 CASE STUDIES OF SUSTAINABLE BUILDINGS **8**

Introduction to the role of green building rating systems- Eg: LEED.. Study the architectural design of the following buildings in order to explore the use of green building materials, energy and water conservation, and creating safe, healthy indoor environments **indian:** Gurgaon Development Centre-Wipro Ltd. Gurgaon; Technopolis, Kolkata; Grundfos Pumps India Pvt Ltd, Chennai; Olympia Technology Park, Chennai; World Bank Chennai Building Chennai; Bpo Park At Chennai. **others:** the Chicago Center for Green Technology Chicago, USA; Green Operations Building White Rock, Canada. U.S. Courthouse, Orlando, USA.

TOTAL 30

TEXTBOOK

1. Sustainable *design manual, Vols 1& 2*, The energy and resource institute, New Delhi.

REFERENCE BOOKS

1. *Charles. J. Kibert, '*Sustainable Construction' John Wiley and sons Inc, USA.
2. N.D. Kaushika, *Energy, Ecology and Environment*, Capital Publishing Company, New Delhi.
3. John Fernandez, *Material Architecture*, Architectural Press, UK.
4. Rodney Howes, *Infrastructure for the built environment*, Butterworth Heineman.
5. G.Tyler Miller JR, *Living in the Environment*, Wardsworth Publishing Company, USA