ACHARYA NAGARJUNA UNIVERSITY

A State Government University, Accredited with "A" Grade by NAAC

Nagarjuna Nagar - 522 510, Guntur, Andhra Pradesh, India.

BACHELOR OF ARCHITECTURE

SYLLABUS

2016 - 2017 onwards

UNIVERSITY COLLEGE OF ARCHITECTURE & PLANNING

PROGRAM CODE:

ANUCAP01


ACHARYA NAGARJUNA UNIVERSITY
సత్యం సర్వం ప్రతిష్ఠితమ్

ABOUT UNIVERSITY

ACHARYA NAGARJUNA UNIVERSITY (ANU)

- A Brief Profile

Acharya Nagarjuna University, a State University established in 1976, has been constantly striving towards achieving progress and expansion during its existence for over four decades, in terms of introducing new courses in the University Colleges, affiliated colleges and professional colleges. Spread over 300 acres of land on the National High Way (NH-16) between Vijayawada and Guntur of Andhra Pradesh, the University is one of the front ranking and fastest expanding Universities in the state of Andhra Pradesh. The University was inaugurated on 11th September, 1976 by the then President of India, Sri Fakruddin Ali Ahmed and celebrated its Silver Jubilee in 2001. The National Assessment and Accreditation Council (NAAC) awarded "A" grade to Acharya Nagarjuna University and also has achieved 108 International ranks, 39 National ranks UI Green Metrics rankings and many more It is named after Acharya Nagarjuna – one of the most brilliant preceptors and philosophers, whose depth of thought, clarity of perception and spiritual insight were such that even after centuries, he is a source of inspiration to a vast number of people in many countries. The University is fortunate to be situated on the very soil where he was born and lived, a soil made more sacred by the aspiration for light and a state of whole someness by generations of students. With campus student strength of over 5000, the University offers instruction for higher learning in 68 UG & PG programs and guidance for the award of M.Phil. and Ph.D. in 48 disciplines spread over six campus colleges and one PG campus at Ongole. It also offers 160 UG programs in 440 affiliated colleges in the regions of Guntur and Prakasam Districts. It has a Centre for Distance Education offering 87 UG & PG programs. Characterized by its heterogeneous students and faculty hailing from different parts of the state and the country, the University provides most hospitable environment for pursuing Higher Learning and Research. Its aim is to remain connected academically at the forefront of all higher educational institutions. The University provides an excellent infrastructure and on- Campus facilities such as University Library with over one lakh books & 350 journals; Computer Centre; University Scientific Instrumentation Centre; Central Research Laboratory with Ultra-modern Equipment; Well-equipped Departmental Laboratories; Career Guidance and Placement Cell; Health Centre; Sports Facilities with Indoor & Outdoor Stadiums and Multipurpose Gym; Sports Hostel; Separate hostels for Boys, Girls, Research Scholars and International Students; Pariksha Bhavan (Examinations Building); Computers to all faculty members; Wi-Fi connectivity to all Departments and Hostels; Canteen, Student Centre & Fast-food Centre; Faculty Club; Dr. H.H. Deichmann & Dr. S.John David Auditorium cum Seminar Hall; Post office; Telecom Centre; State Bank of India; Andhra Bank; Energy Park; Silver Jubilee Park; Fish ponds; internet center; xerox center; cooperative stores; Water harvesting structures

VISION, MISSION & OBJECTIVES OF THE UNIVERSITY

ACHARYA NAGARJUNA UNIVERSITY

VISION

To generate sources of knowledge that dispels ignorance and establish truth through teaching, learning and research.

MISSION

To promote a bank of human talent in diversified faculties – Commerce & Management Studies, Education, Engineering & Technology, Humanities, Law, Natural Sciences, Pharmacy, Physical Education & Sports Sciences, Physical Sciences and Social Sciences that would become an investment for a prosperous society.

OBJECTIVES

- To inspire and encourage all who would seek knowledge through higher education and research.
- To provide quality instruction and research for the advancement of science and technology.
- To promote teaching and research studies in disciplines of societal relevance.
- To bridge the gap between theory and practice of the principles of higher education.
- To develop human talent necessary for the industry.
- To open up avenues of higher education and research through non-formal means.
- To invite and implement collaborations with other institutes of higher learning on a continuous basis for mutual academic progress.
- To motivate and orient each academic department/centre to strive for and to sustain advanced levels of teaching and research so that the university emerges as an ideal institute of higher learning.
- To focus specially on the studies involving rural economy, justifying its existence in the rural setting.

VISION

&

MISSION OF THE COLLEGE / DEPARTMENT

ACHARYA NAGARJUNA UNIVERSITY

UNIVERSITY COLLEGE OF ARCHITECTURE & PLANNING

BACHELOR OF ARCHITECTURE (B.ARCH.)

VISION OF THE COLLEGE:

The Vision of the Department is to generate sources of knowledge that dispel ignorance and establish truth in everything. The core objective of our institution is to provide the best knowledge and design skills needed to resolve challenges related to the design, planning, and execution of all building typologies, and urban spaces that are energy efficient, environmentally friendly, and socially responsible.

MISSION OF THE COLLEGE:

- To provide students with a comprehensive education that prepares them for successful careers in the field of architecture that includes design theory, building technology, sustainability, historic preservation, and urban planning.
- To provide students with opportunities for hands-on experience through design studios, internships, and other practical learning experiences. And also offer opportunities for students to engage with the broader architectural community through service projects, research initiatives, professional internships, and other forms of outreach.
- To produce graduates who are well-equipped to address the complex challenges facing the built environment and who are committed to using their skills and knowledge to create more sustainable, liveable, and equitable communities.
- To foster critical thinking and problem-solving skills, allowing students to address complex design challenges in innovative ways and also to encourage ethical and sustainable practices in architecture, promoting responsible and responsive design.

ACHARYA NAGARJUNA UNIVERSITY

COLLEGE OF ARCHITECTURE & PLANNING

BACHELOR OF ARCHITECTURE (B.ARCH.)

PROGRAM OUTCOMES (PO's):

PO1	**Architectural knowledge:** Apply the knowledge of Architectural design fundamentals, and read through specialized subjects to obtain the solution of complex design challenges, that satisfy aesthetic, functional, and technical requirements.
PO2	**Understanding Buildings, people, and Environment:** To understand the need to relate buildings and the environment to human needs and scale. To be aware of the diverse needs, values, behavioral norms, physical ability, spatial patterns, site planning, sensitization of various gender needs, and implicating this diversity to architectural practice.
PO3	**Problem analysis and Investigation**: Choose, formulate, review, research, experiment, and analyze complex design problems related to Architectural Design, Structures systems, and Mathematics.
PO4	**Comprehensive Design/development of solutions**: Ability to produce comprehensive architectural outcome-based solutions on a Site-building level that includes systematic review through literature, case study, and design development of spaces demonstrating an understanding of building envelope systems, wall sections, and building assemblies.
PO5	**Global practices and cultural heritage**: To develop knowledge of diverse histories, traditions, and architectural practices worldwide. To be aware of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.
PO6	**Modern tool usage:** Create, select, and apply appropriate building techniques using architectural design tools for conceptualizing, modeling of simple and complex designs with an understanding of limitations.
PO7	**The architect and society**: Apply logical thinking informed by the contextual knowledge to assess societal, health, Life-safety, legal and cultural issues, acts followed, and responsibilities relevant to the professional architectural practice.
PO8	**Sustainability and Environmental Conservation**: Understand the impact of the architectural and urban design decisions that achieve sustainability, environmental conservation, and rehabilitation in terms of economy and people.
PO9	**Ethics and Professional Judgement**: Apply ethical principles and understand the aspects involved in the evolution of professional judgment concerning the responsibilities and norms of architectural practice.

PO10	**Communication**: Communicate effectively on complex activities with the architectural community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project Finance and Management**: Demonstrate knowledge and understanding of project finance and management principles and apply these to one's architectural practise, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Building Techniques and Service Systems:** Development of a creative competence in design through building techniques, founded on a comprehensive understanding of the materials, and construction methods along with services related to plumbing, electrical, vertical transportation, communication, security, and fire protection systems.
PO13	**Self-Awareness and Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO's):

On Completion of the Architecture and Planning degree, the graduates will be able to

PSO1	Benefit society through clear knowledge of design and execution of Architectural and interior construction work considering the health, safety, cultural, environmental, and socio-economic factors.
PSO2	Study and investigate the design of regular and complex structures having acquired the knowledge of building design, analysis, and presentation software packages.
PSO3	Work effectively as an individual or in a team having acquired leadership skills and managing projects in multidisciplinary environments.
PSO4	Develop multiple dimensions of intelligence, not just the analytical, but also, the physical, moral, emotional, social, ecological, and spiritual realms.

ACHARYA NAGARJUNA UNIVERSITY

COLLEGE OF ARCHITECTURE & PLANNING

BACHELOR OF ARCHITECTURE (B.ARCH.)

Academic Regulations: Curriculum: C16 (Revised)
Revised on 05/01/2018
(As Approved by Board of Studies in Architecture)
Bachelor of Architecture – Five Years Degree Course

1. AWARD OF THE B. ARCHITECTURE DEGREE:

i) A student will be declared eligible for the award of the B. Architecture Degree if he fulfills the following Academic regulations:

ii) He has to pursue the course of study for not less than five academic years and not more than ten academic years.

iii) He has to register for and study all the subjects and fulfill academic requirements of all subjects.

iv) The entire course of study is of five academic years. All the years shall be on semester pattern.

v) A Student is eligible to appear for the end examination in subject, but absent or has failed in End Examination may appear for that subject at the supplementary examination.

vi) Students, who fail to fulfill all the academic requirements for the award of the degree within ten academic years from the year of their admission, shall forfeit their seat in the course and their seat shall stand cancelled.

2. MINIMUM INSTRUCTION DAYS:

The minimum instruction days for each semester shall be 18 working weeks (90 working days) as per Council of Architecture Norms (Minimum Standards Of Architectural Education, 2008Prescribed Under Section 21 of The Architects Act, 1972) excluding the examination and miscellaneous days.

3. ATTENDANCE REQUIREMENT:

i) A student has to put in a minimum of 75% of the attendance in aggregate of all the subjects for becoming eligible to register for the end examinations and for acquiring credits in each semester.

ii) Condonation of shortage of attendance in aggregate of attendance up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.

iii) A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester.

iv) Shortage of Attendance below 65% in aggregate shall in no case be condoned.

v) Students whose shortage of attendance is not condoned in any semester are not eligible to take their End Examination of that class and their registration shall stand cancelled. They shall seek re- admission for that semester when offered next.

vi) Condonation of shortage of attendance as stipulated in4 (ii) above shall be granted on genuine and valid grounds with supporting evidence.

vii) A stipulated fee shall be payable towards condonation of shortage of attendance applicable for all semesters except the semester where the student undergoes for Practical Training.

viii) Attendance in Practical Training should not be less than 90%. No condonation procedures are applicable.

4. WEIGHTAGE AND DISTRIBUTION OF THE MARKS:

The distribution of marks in general for the subjects shall be: For all Theory/Practical's/Studio subjects: 50%for internal Evaluation and 50% for End Evaluation, except specified otherwise in the course Structure.

5. EVALUATION:

i) The performance of each student enrolled will be assessed in the form of continuous internal assessment and End Semester Examination in a ratio of 50:50

ii) The mode of assessment for theory subjects

a) There shall be two mid examinations consisting of assignments for 15 marks and sessional test for 30 marks with duration of 120 minutes.

b) 5 marks is allotted for attendance as given below

Attendance of 90% and above : 5marks
Attendance of above 85% and below 90% : 3marks
Attendance of above 80% and below 85% : 2marks
Attendance of above 75% and below 80% : 1mark

c) Final mid examination marks for a total of 45 marks shall be arrived at, by considering the 75% weightage (34 marks) to that mid exam in which student scores more marks and the remaining 25%(11 marks) for the exam in which student scores less marks.

d) Sessional exam carries 5 questions out of which 3 must be answered and each question carries 10 marks.

e) Given Assignments to be done as per instructions by the concerned teacher(s) which are given regularly during the course work out of which 2 questions will be given in each mid-examination must be answered during the mid-examination.

iii) For design/studio subjects there shall be continuous evaluation during the semester. Day to day work in studio shall be evaluated for 150 marks by concerned teachers and an end examination (time problem) for 50 marks conducted and evaluated by at least two teachers (average of them must be taken as final marks).

a) Out of 150 marks of day to day work 100 marks is allotted for design portfolio. 30 marks is allotted for case study, literature survey etc., and remaining 20 marks allotted for attendance.

Attendance of 90% and above	: 20marks
Attendance of above 85% and below 90%	:15marks
Attendance of above 80% and below 85%	:10marks
Attendance of above 75% and below 80%	:5 marks

iv) The performance of the student in each semester/shall be evaluated subject-wise with maximum of 400 marks in Design Studio and 100marks in other subjects.

6. VALUATION FOR INTERNAL ASSESSMENT MARKS:

No request for re-evaluation for the internal marks after the results are declared in the course will be entertained.

7. EVALUATION OF DESIGN THESIS:

i) Students are required to present for open seminar/Viva-voce on the Design Thesis. The Internal Assessment for 50% of the total marks shall be done on a periodic basis by two or more internal examiners.

ii) The Design thesis in the ninth semester shall be evaluated for 400 marks.

iii) Out of total 400 marks for the design thesis, 200 marks shall be for Internal Evaluation and 200marks for the End Evaluation which shall be done by an external jury and viva-voce, The End Evaluation shall be conducted by a board of examiners consisting of the Thesis Coordinator (or) Head of the Department (or his/her nominee) and an external examiner.

iv) For the External Evaluation, one Internal Examiner should award 25% of the prescribed marks and75% marks should be assessed by the appointed external Examiner.

8. INSPECTION BY AN OFFICER NOT BELOW THE RANK OF ASSISTANT PROFESSOR FOR THE WORK DONE BY THE STUDENT TRAINEE DURING HIS/HER PRACTICAL TRAINING:

i) In the middle of the practical training /internship one or two faculty members must visit the architecture firms within the country where student is doing their training and must submit feedback report. Feedback report carries 25% of weightage in total marks allotted to internal viva voce exam. If they are outside the country interaction can be carried by video conference.

ii) Each student must submit monthly report containing number of days undergone training and a brief note on work progress. These monthly reports are given 25% of weightage in total marks allotted to internal viva voce examination.

iii) A honorarium of Rs.500 per visit of each firm and TA &DA as per university norms may be paid to faculty who visit the firms to assess student work progress. An advance amount to be issued to the visiting officer (faculty).

9. EVALUATION OF PRACTICAL TRAINING:

i) Attendance in Practical Training should not be less than 90%.

ii) For practical training in final year(tenth semester) shall be evaluated for 400 marks.

iii) Among 400 marks, 200 marks are allotted to internal evaluation and 200 marks for external evaluation.

iv) In internal evaluation out of 200 marks 100 marks are evaluated by the mentor where internship was carried for the work done. In remaining 100 marks, 25 marks are allotted to the interim evaluation/feedback report given by the faculty who visits the firm where student is working, 25 marks are allotted to the monthly reports sent by the student and remaining 50 marks are allotted to internal viva voce conducted by head and two senior faculty members.

10. MINIMUM ACADEMIC REQUIREMENTS:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.**4**

i) A student who could not secure a minimum of 50% aggregate from midterm examination marks is not eligible to appear for the semester end examination and shall have to repeat that semester.

ii) A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, design, drawing subject or project if he secures not less than 40% of marks in the end examination and a minimum of 50% of marks in the sum total of the internal evaluation and end examination taken together. In the internship project he/she should secure 40%. For practical examination he must secure not less than 50% of marks in the semester end examination.

iii) A student shall be promoted from I to II year only if he/she fulfills the academic requirements of attendance and internal marks as stipulated in clause 4 and 11 irrespective of back log subjects in I/V B.Arch.

iv) A student shall be promoted from second to third year only if he/she fulfills the academic requirements of attendance and internal marks as stipulated in clause 4 and 11 and also mustsecure70% of the credits of the subjects that have been studied up to I year II semester from irrespective of whether the candidate takes the end examination or not as

per the normal course of study. At the time of commencement of class work, he must attain the required credits.

v) A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of attendance and internal marks as stipulated in clause 4 and 11 and also must secure70% of the credits of the subjects that have been studied up to II year II semester. At the time of commencement of class work, he must attain the required credits.

vi) A student shall be promoted from fourth year to fifth year only if he fulfills the academic requirements of attendance and internal marks as stipulated in clause 4 and 11 and also must secure 70% of the credits of the subjects that have been studied up to III year II semester. At the time of commencement of class work, he must attain the required credits.

And in case of getting detained for want of credits by sections ii and iii above, the student may make up the credits through supplementary exams of the above exams before the date of class work commencement of Third or Fourth year I semester respectively.

11. GRADING:

After each subject is evaluated for 100 marks, the marks obtained in each subject will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student fall.

TABLE – CONVERSION INTO GRADES AND GRADE POINTS ASSIGNED

Range in which the marks in the subject fall	Grade	Grade points assigned
≥90	O (Outstanding)	10
85-89	A+ (Excellent)	9
75-84	A (Very Good)	8
65-74	B+ (Good)	7
60-64	B (Above Average)	6
55-59	C (Average)	5
50-54	D (Pass)	4
<50	F (Fail)	0
Absent	Ab (Absent)	0

i) A student obtaining Grade F shall be considered failed and will be required to reappear for that subject when the next supplementary examination offered.

ii) For non-credit courses ‘Satisfactory’ or “Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.

11.1. SEMESTER GRADE POINT AVERAGE (SGPA) AND CUMULATIVE GRADE POINT AVERAGE (CGPA):

i) The Semester Grade Point Average (SGPA) is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$SGPA = \Sigma (Ci \times Gi) / \Sigma C_i$$

Where, Ci is the number of credits of the i^{th} subject and Gi is the grade point scored by the student in the i^{th} course.

ii) The Cumulative Grade Point Average (CGPA) will be computed in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

$$CGPA = \Sigma (Ci \times Si) / \Sigma C_i$$

Where 'Si' is the SGPA of the i^{th} semester and C_i is the total number of credits in that semester.

iii) Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

iv) While computing the GPA/CGPA the subjects in which the student is awarded Zero grade points will also be included.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

12. TRANSITORY REGULATIONS:

i) Candidates who admitted into the five-year B.Arch. degree course under C16 regulations but who got detained in any year for want of attendance/minimum aggregate sessional marks may join the appropriate year /semester in the semester system applicable for that batch and be governed by the regulations of that batch from then onwards unless otherwise specified.

ii) A student who readmits must follow the regulations existing at that time and must appear for equivalent subjects.

13. WITH–HOLDING OF RESULTS:

If the candidate has any dues not paid to the college or if any case of indiscipline or malpractice is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted into the next higher semester. The issue of awarding degree is liable to be withheld in such cases.

14. AWARD OF CLASS:

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

CLASS AWARDED	CGPA SECURED
First Class with Distinction	≥ 7.5
First Class	≥ 6.0<7.5
Second Class	≥ 5.5 < 6.0
Pass Class	≥ 5.0 < 5.5

15. GENERAL:

i) The academic regulations should be read as a whole for purpose of any interpretation.

ii) Malpractice rules - nature and punishments is appended

iii) Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

iv) In the case semester-end or ambiguity in the interpretation of the above rules, the decision of the BOS is final.

v) The University may from time to time, revise, amend or change the Regulations, Schemes of Examinations, and/or Syllabi.

16. CONDUCT AND DISCIPLINE:

a) Students shall conduct themselves within and outside the premises of the institute in a manner befitting the students of our institution.

b) As per the order of Honorable Supreme Court of India, ragging in any form is considered as a criminal offence and is banned. Any form of ragging will be severely dealt with.

c) The following acts of omission and / or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures with regard to ragging.

   i) Lack of courtesy and decorum, indecent behavior anywhere within or outside the campus.

   ii) Willful damage of college / individual property

   iii) Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.

   iv) Mutilation or unauthorized possession of library books.

   v) Noisy and unseemly behavior, disturbing studies of fellow students.

   vi) Hacking of computer systems (such as entering into other person's areas without prior permission, manipulation and / or damage of computer hardware and software or any other cyber-crime etc.)

vii) Usage of camera / cell phone in the campus
viii) Plagiarism of any nature
ix) Any other acts of gross indiscipline as decided by the academic council from time to time.

d) Commensurate with the gravity of offense, the punishment may be reprimand, fine, expulsion from the institute / hostel, debar from examination, disallowing the use of certain facilities of the institute, rustication for a specified period or even outright expulsion from the institute or even handing over the case to appropriate law enforcement or the judiciary, as required by the circumstances.
e) For an offence committed in (i) a hostel (ii) a department or in a class room and (iii) elsewhere, the chief warden, the head of the department and the principal respectively, shall have the authority to reprimand or impose fine.
f) Cases of adoption of unfair means and / or any malpractice in an examination shall be reported to the principal for taking appropriate action.
g) All cases of serious offence, possibly requiring punishment other than reprimand, shall be reported to the academic council.
h) The institute level standing disciplinary action committee constituted by the academic council shall be the authority to investigate the details of the offence, and recommend disciplinary action based on the nature and extent of the offence committed.
i) The principal shall deal with any academic problem, which is not covered under these rules and regulations, in consultation with the programmes committee in inappropriate manner, and subsequently such actions shall be placed before them academic council for ratification. Any emergency modification of regulation, approved by the appropriate authority, shall be reported to the academic council for ratification.
j) "Grievance and Redressal Committee" (General) constituted by the Principal shall deal with all grievances pertaining to the academic / administrative / disciplinary matters

17. PUNISHMENTS FOR MALPRACTICE CASES – GUIDELINES:

The examinations committee may take the following guidelines into consideration while dealing with the suspected cases of malpractice reported by the invigilators/squad members etc.; during end examinations. The punishment may be more severe or less severe depending on the merits of the individual cases.

S.No.	NATURE OF MALPRACTICES / IMPROPER CONDUCT	PUNISHMENT
1.	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the student which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
2.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
3.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
4.	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any other student or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
5.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the student is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects including practical examinations and project work of that semester/year.
6.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects including practical examinations and project work of that semester/year.

7.	Smuggles in the Answer book or takes out or arranges to send out the question paper during the examination or answer book during or after the examination	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects including practical examinations and project work of that semester/year. The student is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
8.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects of that semester/year. The students also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

9.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects including practical examinations and project work of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
10.	Possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects including practical examinations and project work of that semester/year. The student is also debarred and forfeits the seat.
11.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 7 to 9.	For Student of the college: Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects including practical examinations and project work of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
12.	Impersonates any other student in connection with the examination	The student who has impersonated shall be expelled from examination hall. The student is debarred from writing the remaining exams, and rusticated from the college fur one academic year during which period the student will not be permitted to write any exam. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.

		The performance of the original student who has been impersonated, shall be cancelled in all the subjects of the examination including practical's and project work of that semester/year. The student is rusticated from the college for two consecutive years during which period the student will not be permitted to write any exam. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat
13.	If any malpractice is detected which is not covered in the above clauses 1 to 12 it shall be reported to the college academic council for further action to award suitable punishment.	
14.	Malpractice cases identified during sessional examinations will be reported to the examination committee nominated by Academic council to award suitable punishment.	

STRUCTURE

ACHARYA NAGARJUNA UNIVERSITY

COLLEGE OF ARCHITECTURE & PLANNING

BACHELOR OF ARCHITECTURE

CURRICULUM C16

Effective for the students admitted into 1st year from Academic year 2016-17

COURSE STRUCTURE

FIRST YEAR : I SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/PT (Hrs./Week)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR111 (C16)**	Architectural Drawing and Graphics-I	S	4	4	3 Hrs	_	50	50	100
2	**AR112 (C16)**	Principles of Architecture	Th	2	2	3 Hrs	_	50	50	100
3	**AR113 (C16)**	Building Materials – I	Th	3	3	3 Hrs	_	50	50	100
4	**AR114 (C16)**	Building Construction- I	S	4	4	5 Hrs	_	50	50	100
5	**AR115 (C16)**	Communication Skills	Th/L	2	2	3 Hrs	_	50	50	100
6	**AR116 (C16)**	Computer Applications-I	L	2	2	_	Practical / Lab	50	50	100
7	**AR117 (C16)**	Visual Arts	L	4	4	_	Practical	50	50	100
8	**AR118 (C16)**	Basic Design	S	9	9	6 Hrs	_	200	200	400
	TOTAL			**30**	**30**	**_**	**_**	**550**	**550**	**1100**

* S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, V–Viva Voce

FIRST YEAR : II SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/PT (Hrs./Week)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR121 (C16)**	Architectural Drawing and Graphics - II	S	4	4	3 Hrs	_	50	50	100
2	**AR122 (C16)**	World Architecture	Th	3	3	3 Hrs	_	50	50	100
3	**AR123 (C16)**	Building Materials – II	Th	3	3	3 Hrs	_	50	50	100
4	**AR124 (C16)**	Building Construction – II	S	4	4	5 Hrs	_	50	50	100
5	**AR125 (C16)**	Structural Mechanics	Th	4	4	3 Hrs	_	50	50	100
6	**AR126 (C16)**	Advanced Model Making	L	4	4	_	Practical / Lab	50	50	100
7	**AR127 (C16)**	Architectural Design –I	S	9	9	6 Hrs	_	200	200	400
TOTAL				**31**	**31**	_	_	**500**	**500**	**1000**

* S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, V–Viva Voce

SECOND YEAR : III SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/PT (Hrs./Week)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR 211 (C16)**	Architectural Drawing and Graphics - III	S	4	4	4 Hrs	_	50	50	100
2	**AR 212 (C16)**	Buddhist and Hindu Architecture	Th	3	3	3 Hrs	_	50	50	100
3	**AR 213 (C16)**	Structural Analysis	Th	3	3	3 Hrs	_	50	50	100
4	**AR 214 (C16)**	Building Construction – III	S	4	4	4 Hrs	_	50	50	100
5	**AR 215 (C16)**	Site Planning & Landscape Design	Th	3	3	3 Hrs	_	50	50	100
6	**AR 216 (C16)**	Surveying Theory	Th	3	3	3 Hrs	_	50	50	100
7	**AR 217 (C16)**	Surveying Practicals	L	4	4	_	Practical / Lab	50	50	100
8	**AR 218 (C16)**	Architectural Design – II	S/V	9	9	_	Jury / Viva-Voce	200	200	400
TOTAL				**33**	**33**			**550**	**550**	**1100**

* S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, S/V–Studio/Viva Voce

SECOND YEAR : IV SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/PT (Hrs./Week)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR 221 (C16)**	Climate Responsive Architecture	Th	3	3	3 Hrs	_	50	50	100
2	**AR 222 (C16)**	Islamic Architecture	Th	3	3	3 Hrs	_	50	50	100
3	**AR 223 (C16)**	Design of Structures: RCC – I	Th	4	4	3 Hrs	_	50	50	100
4	**AR 224 (C16)**	Building Construction – IV	S	4	4	4 Hrs	_	50	50	100
5	**AR 225 (C16)**	Building Services: Water supply and Sanitation	Th	3	3	3 Hrs	_	50	50	100
6	**AR 226 (C16)**	Computer Applications – II	L	4	4	–	Practical / Lab	50	50	100
7	**AR 227 (C16)**	Architectural Design - III	S/V	9	9	_	Jury / Viva-Voce	200	200	400
TOTAL				**30**	**30**			**500**	**500**	**1000**

* S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, S/V–Studio/Viva Voce

THIRD YEAR : V SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/PT (Hrs)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR 311 (C16)**	Building Estimation, Specifications and Costing	Th	4	4	3 Hrs	_	50	50	100
2	**AR 312 (C16)**	Modern Architecture	Th	3	3	3 Hrs	_	50	50	100
3	**AR 313 (C16)**	Design of Structures: RCC - II	Th	4	4	3 Hrs	_	50	50	100
4	**AR 314 (C16)**	Building Construction - V	S	4	4	3 Hrs	_	50	50	100
5	**AR 315 (C16)**	Building Services: Lighting and Electrical	Th	3	3	3 Hrs	_	50	50	100
6	**AR 316 (C16)**	Building Codes and Bye Laws	Th	3	3	3 Hrs	_	50	50	100
7	**AR 317 (C16)**	Computer Applications-III	L	4	4	_	Practical / Lab	50	50	100
8	**AR 318 (C16)**	Architectural Design - IV	S-V	9	9	_	Jury / Viva-Voce	200	200	400
TOTAL				**34**	**34**			**550**	**550**	**1100**

S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, V–Viva Voce

THIRD YEAR : VI SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/PT (Hrs)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR 321 (C16)**	Green Building Concepts	Th	3	3	3 Hrs	_	50	50	100
2	**AR 322 (C16)**	Contemporary Architecture	Th	3	3	3 Hrs	_	50	50	100
3	**AR 323 (C16)**	Design of Steel Structures	Th	4	4	3 Hrs	_	50	50	100
4	**AR 324 (C16)**	Architectural Acoustics	Th	3	3	3 Hrs	_	50	50	100
5	**AR 325 (C16)**	Environmental Studies	Th	3	3	3 Hrs	_	50	50	100
6	**AR 326 (C16)**	Working Drawings and Details	S-V	6	6	_	Jury / Viva-Voce	50	50	100
7	**AR 327 (C16)**	Architectural Design - V	S-V	9	9	_	Jury / Viva-Voce	200	200	400
TOTAL				**31**	**31**			**500**	**500**	**1000**

S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, V–Viva Voce

FOURTH YEAR : FIRST SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/ PT (Hrs)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR 411 (C16)**	Urban Design Theory	Th	3	3	3 Hrs	_	50	50	100
2	**AR 412 (C16)**	Human Settlements and Town Planning	Th	4	4	3 Hrs	_	50	50	100
3	**AR 413 (C16)**	Advanced Services	Th	3	3	3 Hrs	_	50	50	100
4	**AR 414 (C16)**	Advanced Construction and Structural Systems	Th	4	4	3 Hrs	_	50	50	100
5	**AR 415 (C16)**	***ELECTIVE – I***	Th	4	4	3 Hrs	_	50	50	100
	AR 415.1 (C16)	Housing								
	AR 415.2 (C16)	Interior Design								
	AR 415.3 (C16)	Landscape Planning & Design								
	AR 415.4 (C16)	Building Construction and Management								
6	**AR 416 (C16)**	Advanced Design Studio	S-V	9	9	_	Jury / Viva-Voce	200	200	400
7	**AR 417 (C16)**	Moocs-1	Th	_	4	online exam	_	_	100	100
TOTAL				**27**	**31**			**450**	**550**	**1000**

S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, V–Viva Voce

FOURTH YEAR : SECOND SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/PT (Hrs)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR 421 (C16)**	Building Economics and Sociology	Th	3	3	3 Hrs	_	50	50	100
2	**AR 422 (C16)**	Dissertation	L	4	4	_	_	100	_	100
3	**AR 423 (C16)**	Advanced Communication Skills	L-V	3	3	_	Lab/Viva-Voce	50	50	100
4	**AR 424 (C16)**	Structural Design Project	P-V	7	7	_	Jury / Viva-Voce	50	50	100
5	**AR 425 (C16)**	Urban Design Studio	S-V	9	9	_	Jury / Viva-Voce	200	200	400
TOTAL				**26**	**26**			**450**	**350**	**800**

S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, V–Viva Voce

FIFTH YEAR : FIRST SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/ PT (Hrs)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR 511 (C16)**	Practical Training	PT	40	40	–	Jury / Viva-Voce	200	200	400
2	**AR 512 (C16)**	Moocs-2	Th	–	4	online exam	–	–	100	100
TOTAL				**40**	**44**			**200**	**300**	**500**
S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, V–Viva Voce										

FIFTH YEAR : SECOND SEMESTER

S. No.	Course No.	Course Title	* S-V/ S/L/Th/P/PT (Hrs)		Credits	Duration of Examination		Marks		
						Theory/ Drawing	External Practical/Jury / Viva-Voce	I	E	T
1	**AR 521 (C16)**	Design Thesis	P	22	22	–	Jury / Viva-Voce	200	200	400
2	**AR 522 (C16)**	Professional Practice	Th	4	4	3 Hrs	–	50	50	100
3	**AR 523 (C16)**	***ELECTIVE – II***	Th	4	4	3 Hrs	–	50	50	100
	AR 523.1 (C16)	Architectural Journalism								
	AR 523.2 (C16)	Furniture and Product Design								
	AR 523.3 (C16)	Disaster Resistant Architecture								
TOTAL				**30**	**30**			**300**	**300**	**600**
S-Studio Class, L-Lab, Th–Theory, P–Project, PT–Practical Training, I–Internal, E–External, T–Total, V–Viva Voce										

GRAND TOTAL	**312**	**320**			**4550**	**4650**	**9200**

First Semester

ACHARYA NAGARJUNA UNIVERSITY
COLLEGE OF ARCHITECTURE & PLANNING
BACHELOR OF ARCHITECTURE
SEMESTER-I

AR111(C16): ARCHITECTURAL DRAWING AND GRAPHICS – I

Periods / Week : **04**
Periods / Semester : **72**
Credits : **4**
Internal Assignments & Mids. : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs. (University Exam, Drawing & Theory)**

TIME SCHEDULE

S. No.	Major Topics	No. of periods	Weightage of marks	No of short ans. questions	No of essay ans. questions
1.	Unit-I (Introduction & Drawing Equipment)	2	-	-	-
2.	Unit-II (a) Sheet Sizes	2	-	-	-
	(b) Simple Drafting exercises	8	10	-	1
	(c) Line weights and Line types	2	5	1	
	(d) Dimensioning	2	-	-	
	(e) Lettering	4	5	1	
	Title panels and legends	2	-	-	-
3.	Unit-III (Geometrical construction)	14	10	-	1
4.	Unit-IV (Architectural Symbols)	8	10	2	-
5.	Unit-V (Measuring and Drawing to Scale)	16	20	-	2
6.	Unit-VI (Free Hand Drawings)	12	10	-	1
	TOTAL	**72**	**70**	**4**	**5**

Note:
1) Duration of examination is for 3 hours Drawing & Theory Examination
2) Part A: 4 questions – each question carries 5 marks, all 4 to answer and no choice
3) Part B: 3 questions have to be answered out of 5 questions each question carries 10 marks (2 are choice).

COURSE OVERVIEW:

The course introduces the fundamental techniques of architectural drawing and develops the appropriate skills for visualization and representation.

COURSE LEARNING OBJECTIVES:

- To introduces the fundamental techniques of architectural drawing and develops the appropriate skills for visualization and representation**.**
- To introduce architectural drawing techniques and to facilitate effective visual communication.
- To teach Freehand, scale drawing, conventional architectural representations in drawings and graphics.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To understand the conventions and standards for drawing and graphics in the architectural profession.
CO 2	To use traditional and digital tools and techniques for architectural drawing and graphics.
CO 3	To develop the ability to communicate architectural ideas and concepts visually using both 2D and 3D techniques.
CO 4	To provide students with a solid foundation in the skills and knowledge needed to create effective architectural drawings and graphics.
CO 5	To emphasize the importance of accuracy and precision in architectural drawing and graphics.
CO 6	To develop the ability to read and interpret architectural plans, sections, and elevations.

UNIT – I

Introduction: Fundamentals of drawing and its practice, introduction to drawing equipment, familiarization, use and handling.

UNIT – II

Drawing: Drawing sheet sizes, layouts and composition. Simple exercises in drafting, line types, line weights; dimensioning, Typography –anatomy of Type, Styles, Roman and Gothic style lettering; Freehand lettering, title panels and legends.

UNIT – III

Geometrical Construction: Constructing simple and complex geometrical shapes involving various drafting technique drawing regular shapes using T-sqaures, set-sqaures; Special methods of drawing regular polygons; Regular polygons inscribed in a Circle.

UNIT – IV

Architectural Symbols: Representation of building elements, openings, materials, furniture and accessories; human postures; vegetation; vehicles; terminology and abbreviations used in architectural representation.

UNIT – V

Measuring and Drawing to Scale: Scales and construction of scales, scaled drawings of simple objects, furniture, rooms, doors and windows etc., in plan, elevation and section. Reduction and enlargement of drawings.

UNIT – VI

Free Hand Drawings: line stokes, light and shade techniques of simple, natural and 3D geometric forms. Study of proportions and scale; structure and axes of objects; Outdoor sketching of simple building forms.

Note: This is a studio subject and students should be made to prepare drawings as studio exercises along with the theoretical inputs. The studio work should be supplemented with appropriate site visits.

COURSREFERENCE BOOKS:

1) Moris, I.H. Geometrical Drawing for Art Students.
2) Thoms, E. French. Graphic Science and Design, New York: MC Graw Hill.
3) Nichols, T.B. and Keep, Norman. Geometry of Construction, 3rd ed. Cleaver – Hume Press Ltd., London, 1959.Bhatt, N.D. and Panchal V.M. Engineering Drawing: Plane and Solid Geometry, 42nd ed. Charotar Pub., Anand, 2000.
4) Gill, P.S. T.B. of Geometrical Drawing, 3rd ed. Dewan Suhil Kumar Kataria, Ludhiana, 1986.
5) Shah, M.G., Kale, C.M. and Patki, S.Y. Building Drawing: with an integrated approach to built environment, 7th ed. Tata McGraw Hill Pub., Delhi, 2000.
6) Bies, D. John. Architectural Drafting: Structure and Environment. Bobbs – Merrill Educational Pub., Indianapolis.
7) Nelson, A. John. H.B. of Architectural and Civil Drafting, Van Nostrand Reinhold, New York, 1983.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR111 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	-	1	-	-	-	1	-	-	-	1	1	1	1
CO2	2	-	-	-	-	1	-	-	-	1	-	-	-	1	1	1	1
CO3	2	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-
CO4	2	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-
CO5	2	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-
CO6	2	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-
Total	12	-	-	-	-	7	-	-	-	6	-	-	-	2	2	2	2

AR112(C16): PRINCIPLES OF ARCHITECTURE

Periods/Week -2
Periods/Semester - 36
Credits - 2
Internal Assignments & Mids. - 50 Marks
External Examinations - 50 Marks
Total Marks - 100 Marks
Duration of Exam - 3Hrs (University Exam Theory)

TIME SCHEDULE

S. No.	Major Topics	No. of Periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I (A brief description of architecture)	6	18	1	2
2.	Unit – II (The concept of beauty)	6	10	1	1
3.	Unit – III (Indoor space, outdoor space)	8	10	1	1
4.	Unit – IV (Proportion, its application and advantages in architecture)	8	18	1	2
5.	Unit – V (Ordering principles, their need and application in architecture)	8	18	1	2
TOTAL		**36**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours Theory Examination
2) Part A: 5 questions – each question carries 2 marks, all 5 to answer and no choice
3) Part B: 5 questions have to be answered out of 8 questions each question carries 10 marks (3 are choice)

COURSE OVERVIEW:

Principles of design provides the framework for understanding design as a new language by sensitizing students to the conceptual, visual and perceptual issues involved in the design process.

COURSE COURSE OBJECTIVES:

- Principles of design provides the framework for understanding design as a new language by sensitizing students to the conceptual, visual and perceptual issues involved in the design process.
- To inculcate the innate sense of analyzing and interpreting the elements of design.
- Understanding of composition, form, space and void to ensure the learning necessary to evolve and reproduce in both two and three dimensions.
- To prepare ground for the students to gain an understanding into the fundamental issues in design and develop the skill to create solutions for simple elements of building.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understanding Architecture as an occupation compared to visual and temporal arts and various subjects of and science and technology, its relation to design.
CO 2	Relating the difference in the concept of beauty and geometry in architecture through learning of principles od design and putting them up with analytical ability.
CO 3	Understanding the concept of space in buildings. The relationship between man and the space used by him, bringing out outcome-based solutions learning from reviews and diversified needs of different age and gender people.
CO 4	Understanding of scale and its application in architecture and advantages. Application of human scale and generic scale in architecture using design tools for generating concepts in architectural design.
CO 5	Understanding examples from history of architecture. The use of design principles in architecture, and their application and advantages in buildings.

COURSE CONTENTS:

Unit I

A brief description of architecture: Architecture as an occupation. Architecture compared to visual and temporal arts. Architecture and science and technology: Architecture and social science. The work of an architect compared to that of an artist, technologist and a designer/craftsman, scope of architecture.

Unit II

The concept of beauty: Philosophical and psychological view. Subjective and objective aspect of it. Difference in the concept of beauty due to social, regional and temporal variations. Basic principles of visual perception. Form and its visual properties. Visual qualities of five Basic geometric forms. Additive forms and subtractive forms.

Unit III

Indoor space, outdoor space: the concept of space in buildings. The relationship between man and space. Defining spaces and the degree of enclosure. Organisation of spaces, fenestration, and character of facade, enclosure and internal spaces. Articulation of form.

Unit IV

Proportion, its application and advantages in architecture: Application of order, golden section, modular with examples from history of architecture. Scale, its application in architecture and advantages. Application of human scale and generic scale in architecture.

Unit V

Ordering principles, their need and application in architecture: Various ordering principles available and their application in buildings with examples from history of architecture. The use of colors in architecture, principles of colours and their application and advantages in buildings.

REFERENCE BOOKS:

1) ARG Isaac, " Approach to architectural Design", Butter worth & Co. Ltd., London, 1977.
2) Anthony J.Catanese & James C. Snyder, "Introduction to architecture," McGraw Hill Books Co., Newyork, 1988.
3) Francis D. K. Ching, "Architecture: Form, Space and Order," Wiley; 3rd Edition edition (3 August 2007)

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR112 (C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	1	3	3	2	2	-	1	1	-	1	-	2	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	1	-	1	2	-	-	1	-	3
CO4	2	2	2	2	2	1	1	3	-	-	1	1	-	1	-	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	3	-	1	-	1	3
TOTAL	08	14	12	09	09	05	06	09	01	03	02	11	01	03	2	1	15

AR113(C16): BUILDING MATERIALS – I

Periods / Week : 3
Periods / Semester : 54
Credits : 3
Internal Assignments & Mids. : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3 Hrs. (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I (Brick)	6	10	1	1
2.	Unit – II (Stone)	9	18	1	2
3.	Unit – III (Sand)	6	8		1
4.	Unit – IV (Cement)	6	8		1
5.	Unit – V (a) Mortars (b) Concrete	9	10	1	1
6.	Unit – VI (Timber)	9	10	1	1
7.	Unit – VII (c) Ferrous Metals (d) Non Ferrous Metals	9	10	1	1
TOTAL		**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours Theory Examination
2) Part A: 5 questions – each question carries 2 marks, all 5 to answer and no choice
3) Part B: 5 questions have to be answered out of 8 questions each question carries 10 marks (3 are choice)

COURSE OVERVIEW:

The course provides information on the properties, use, installation and costs of basic building materials.

COURSE LEARNING OBJECTIVES:

- To impart knowledge on the various building materials,
- To highlight the current trends and innovations in the usage of building materials
- understanding of the properties, selection, production, manufacturing, testing, safety, sustainability, economic considerations, design considerations, and building science related to brick, stone, sand, timber, ferrous and non-ferrous metals, and cement manufacturing, testing, safety, sustainability, economic considerations of various building materials

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To identify different building materials and select appropriate materials for specific applications based on their properties, cost, and availability
CO 2	Understand the manufacturing and production methods of different building materials, including the environmental impact of these methods
CO 3	Understand the safety aspects related to the use of building materials, including the handling and disposal of hazardous materials.
CO 4	To be aware of the economic factors related to the selection and use of building materials, including their cost, availability, and market trends.
CO 5	understanding of the science behind how building materials work and how they interact with the environment

COURSE CONTENTS:

Unit –I

Brick: Composition of brick earth, standards aper ISI, brick manufacturing processes, requirements and tests for good bricks. Fire clay bricks - varieties; sand lime bricks; paving bricks; Terra-cotta-its varities., Special types of bricks, uses and properties. Different uses of brick in construction and their properties.

Unit –II

Stones: Classification of rocks: method of quarrying of building stones, dressings defects in stone, tools used.ISI standards.

Preservation of stone work. stone units - khandki, rubble, black stones, stone metal, flag stones. types of stone, stones used in construction, classification of stones :granite, laterite, quartzite, marble and slates -properties and uses; uses in construction, aggregates.,

Unit –III

Sand : Sources of sand, bulk age of sand, impurities in sand their removal, tests for silt and organic contents different grades of sand with respective to size and their application. I.S.I. standards.

Unit –IV

Cement: Manufacturing process, Types of cement, Grades of cements, Tests on cement, ISI Standards, Application and its properties.

Unit –V

Mortars: Types, mixing and grinding, mortar, cement mortar, lime mortar, methods of preparing, handling and uses of mortars, Surkhi-mortar, light weight mortars i.e. cinder, sawdust and fibrous plaster, gypsum plaster, Plaster of Paris and application.

Concrete: aggregates, water cement ratio, admixtures, properties of concrete, strength, durability, aging of concrete, mixing and curing, advanced concretes.

Unit –VI

Timber: Sources of timber, types and its properties, methods of sawing, shrinkage and distortion, wastage, Drying and seasoning, moisture contents, purpose of seasoning, natural and artificial. Defects in timber. Use and application of timber in construction.

Unit –VII

Ferrous Metals - Pig iron, cast iron, wrought iron, steel, manufacturing processes and casting. Characteristics form and uses of cast iron, wrought iron and steel.

Alloys steel, stainless steel, steel-treatment, steel tempering, annealing, normalizing, and case hardening, their objectives and effect on alloy steels. Galvanizing, oxidation and casting of metallic products, corrosion of iron and their prevention. Metallic protective coatings.

Non ferrous Metals: Basic idea of important ores, properties and uses of Aluminum, Zinc, Copper, Tin and Lead.

COURSREFERENCE BOOKS:

1) **Hailey & Hancork, D.W.** Brick Work & Associated Studies Vol. 2. MacMillan, London, 1979.
2) **Moxley, R.** Mitchell'sElementary Building Construction, Technical Press Ltd.
3) **Rangwala, S.C.** Building Construction, 22nd ed. Charotar Pub. House, Anand, 2004.
4) **Sushil Kumar.** T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR 113(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2	1	-	-	-	1	-	1	3	-	1	1	-	-
CO2	1	2	1	2	3	-	1	2	-	-	-	3	-	2	2	-	2
CO3	1	2	1	2	1	-	-	-	1	-	1	3	-	1	1	-	-
CO4	1	2	2	2	2	-	3	-	1	-	1	3	-	1	1	-	-
CO5	2	3	2	2	1	-	1	2	-	-	-	3	-	2	2	-	2
Total	06	11	07	10	08	-	05	04	03	-	03	15	-	07	07	-	04

AR114(C16): BUILDING CONSTRUCTION- I

Studio Periods/Week : **4**
Studio Periods / Semester : **72**
Credits : **4**
Internal Assignments & Mids. : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **5 Hrs. (University Drawing Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans. Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit–I (Brick Work)	12	10	1	1
2.	Unit – II (Stone Masonry)	12	10	1	1
3.	Unit – III (a) Composite Masonry & (b) Cladding	8	8	-	1
4.	Unit – IV (c) Lintels & (d) Arches	12	18	1	2
5.	Unit – V (e) Ground & Upper floors & (f) Flooring Finishes	16	18	1	2
6.	Unit – VI (Flat Roofs)	12	10	1	1
	Total:	**72**	**74**	**5**	**8**

Note:

1) Duration of examination is for 5 hours Drawing & Theory Examination with no break

2) Part A: 5 questions – each question carries 2 marks, all 5 to answer and no choice

3) Part B: 5 questions have to be answered out of 8 questions each question carries 8 marks (3 are choice)

COURSE OVERVIEW:

The course introduces to the methods and techniques of construction of basic elements of a simple building.

COURSE OBJECTIVES:

- To introduce and expose to various masonry works used in building construction.
- To understand about the superstructure and designing its elements.
- To understand about floor , floor finishes and their components.
- To understand the advanced concepts through materials and construction techniques for super structure.

EXPECTED SKILLS / KNOWLEDGE TRANSFERRED:

To understand the techniques of construction of a simple load bearing structure with simple material like brick, stone etc.

COURSE OUTCOMES:

CO 1	Understand and analyze various basic building elements of a structure according to human need, and prepare drawings according to norms of buildings.
CO 2	Understand and analyze the masonry works and their usage in constructing a structure and their methods
CO 3	Ability to analyze and design various building elements mainly Sub Structure to understand and draw the technical drawings through plans and sections
CO 4	. Ability to analyze and design various elements of the Super Structure and to design the building technical drawings of super structure through plans and sections
CO 5	Design and detailing of technical drawings of building components such as walls, floors and roofs.
CO 6	To understand and develop the advanced concepts of building construction through materials and construction techniques.

COURSE CONTENTS:

Unit – I

Brickwork: Various types of bonds, stopped ends, junctions, piers, jambs, footings, foundations, corbelling, damp proof course, window sills, thresholds, copings, mortar joints and pointing.

Unit – II

Stone masonry: stone walls, rubble work, ashlar work, masonry joints, window sills, plinth, cornices, surface finishes.

Unit – III

(a) Composite masonry: Brick backed ashlar, rubble backed ashlar, concrete backed masonry, ashlar faced concrete walls, marble faced masonry; tile faced concrete, hollow block masonry.

(b) Cladding: Cladding of various materials-marble, granite, slate, tiles, metal etc.

Unit – IV

(c) Lintels: Lintels of wood, stone, brick.

(d) Arches: arches; terms defined; various forms of arches like segmental, semi-circular, elliptical, three-centered, flat and relieving arch, etc.

Unit – V

(e) **Ground and upper floors:** solid floor, brick flooring, floor finishing and floor coverings, Basement floor

(f) Flooring Finishes: Brick on edge, concrete, wood, Indian patent floor, granolithic, terrazzo, pitch mastic, Magnesium Oxide, Chloride, flag stone or shahbad stone flooring, etc.

Unit – VI

Flat roofs: Madras terrace, Jack arch, elementary knowledge about R.C.C roof and floor slabs.

COURSREFERENCE BOOKS:

1) Barry, R. The Construction of Buildings Vol. 2, 5th ed. East-West Press. New Delhi, 1999.
2) Bindra,S P.and Arora, S P. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.
3) Hailey and Hancork, D.W. Brick Work and Associated Studies Vol. 2. MacMillan, London, 1979.
4) Moxley, R. Mitchell's Elementary Building Construction, Technical Press Ltd.
5) Rangwala, S.C. Building Construction, 22nd ed. Charotar Pub. House, Anand, 2004.
6) Sushil Kumar. T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

The class work and home assignments should include appropriate site visits by the students. Student will maintain field observations / record books. At least two exercises to be done in the construction yard.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR 114(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	2	1	1	2	1	-	1	3	2	1	1	-	-
CO2	1	3	1	3	1	2	1	1	-	1	-	2		1	1	-	-
CO3	3	2	2	3	1	2	1	1	1	1	1	3	1	2	3	-	2
CO4	3	2	2	3	2	1	1	1	1	1	1	3	1	1	2	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	2	-	1	1	-	1
CO6	1	2	2	2	1	-	1					1		-	-	-	-

AR 115(C16) : COMMUNICATION SKILLS-1

Theory Periods/Week	**-2**
Theory Periods/Semester	**-36**
Credits	**- 2**
Internal Assignments & Mids	**- 50**
External Examinations	**- 50**
Total Marks	**- 100**
Duration of Exam	**- 3 Hrs (University Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of Periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I Introduction	4	10	1	1
2.	Unit – II Writing Skills	8	18	1	2
3.	Unit – III Formal and Informal letter writing	6	10	1	1
4.	Unit – IV Listening & Reading Comprehension	8	18	1	2
5.	Unit – V Presentation Skills	10	18	1	2
Total:		**36**	**74**	**5**	**8**

Note: Examination Question Paper

1) Part-A: 5 questions all are compulsory each caries 2 marks

2) Part-B: 5 questions to answer from 8 questions each caries 8 marks.

EXPECOURSE LEARNING OBJECTIVES:

- To realize the importance of communication skills in job arena and enhance the students ability to communicate effectively.
- The overall performance of the student will be enhanced after course.
- Students will be able to speak, read, listen & write effectively in both academic and non-academic environment, business environment and enhance good skills.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO1	To understand the importance of communication skills in present job arena and develop them to communicate effectively.
CO2	To explain the importance of writing skills and guide them to write effective reports, essays, reviews, documents etc.
CO3	To describe the importance writing different types of letters formal, informal letters, covering letters etc.
CO4	To define the need of listening in the society at large and make the students understand the difference between hearing, listening and active listening, which helps them to receive and give clear instructions.
CO5	To recognize the importance of presentation skills in Architecture and to modify them to make effective presentation.

Unit –I

Introduction – Importance of Communication in day to day life, elements of good communication, types of communication, barriers in the path of communication. Orientation for improving the skills of grammar, punctuation and vocabulary in English, focused primarily on developing communication skills.

***Classroom Activities**: Group and pair activities on communication, Dictionary Usage, Identifying Parts of Speech, Marking Punctuation to the given paragraph, Correction of sentences.

Unit-II

Writing Skills:

Creative writing, Scope of creative writing, Importance of writing skills, signposting, outlines, rephrasing, essay writing, report writing, Review of articles etc. Writing a report/format of the report, memo, circular, notice, covering letter, resume, preparation of minutes.

Note: *Classroom Activities: Collection of data from library and other sources, writing review to an article or book, writing an abstract, article and synopsis.

Unit-III

Reading Skills:

Reading, Types of reading, reading Comprehension-reading styles and critical analysis, reading technical articles from journals, newspapers, books etc related to Architecture, tips for effective reading and benefits of reading.

Note: *Classroom Activities: Reading English news papers for specific information, Dictionary referring, doing reading related exercises using books and magazines in the library.

Unit-IV

Listening :

-Role of listening in communication, listening for accent, rhythm and intonation, listening for main idea and specific information, listening to conversation and speeches.

-Reading for facts, Reading for main idea, Scanning and skimming the text, Inference of lexical and contextual meaning.

Note: *Classroom Activities: Listening for specific information through audio, listening for improving pronunciation, listening to inspirational speeches of great public speakers etc.

Unit –V: Speaking Skills

Phonetics, consonants, vowels, Diphthongs, stress, Rhythm and intonation, Conversation sills, Role play**,** telephonic skills, short Extempore (JAM)) Sessions, Paper Presentation, Elocution.

Note: *Classroom Activities: Practicing Oral Presentation Skills and improving body language skills, practicing phonetic sounds and pronunciation in lab.

COURSREFERENCE BOOKS:

1) Dr.ShaliniVerma, Word Power Made Handy, S.Chand& Co Ltd., 2009.
2) Sharon J.Gerson, Steven M.Gerson, Technical Writing, New Delhi: Pearson education, 2007.
3) Sanjay Kumar and PushpLata, Communication Skills, Noida: Oxford University Press, 2012.
4) M. Ashraf Rizvi, Effective Technical Communication, New Delhi: Tata Mc-Grew Hill, 2009.
5) Bikram K. Das, Kalyani Samantray, Rath Nayak, Susmita Pani& Saveeta Mohanty, An Introduction to Professional English and Soft Skills, New Delhi: Foundation Books, 2009.
6) Krishna Mohan& Meera Banerji: Developing Communication , Macmillan India.
7) Daniel Colman: Emotional Intelligence.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR115(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	2	-	-	-	-	-	3	-	-	-	1	-	-	2
CO2	-	2	2	-	-	-	-	-	-	3	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	--
CO4	-	2	-	-	3	-	2	-	-	3	-	-	-	1	-	3	-
CO5	-	--	-	-	-	2	-	-	-	3	-	--	--	-	2	-	-
Total	3	4	2	2	3	2	2	-	-	15	-	-	-	2	2	3	2

AR 116(C16): COMPUTER APPLICATIONS - 1

Digital Lab Periods/Week :2
Digital Lab Periods/Semester :36
Credits :2
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3Hrs (Lab & Viva)

TIME SCHEDULE

S. No	Major Topics	No. of periods
1	Introduction to Graphic Design	2
2	MS- Office – Word, Excel, PowerPoint	8
3	Digital Illustration – Corel Draw • Introduction to Vector Graphics • Logo Design • Stationary Design • Poster Design • Brochure Design	8
4	Image Editing – Adobe Photoshop • Introduction to Raster Graphics • Architectural Plan Rendering • Architectural Elevation Rendering • Making of Web page • Usage of Actions, Filters and Etc.,	10
5	Print and Interactive Publishing – Adobe InDesign • Create basic page elements • Learn about styles and how they impact productivity • Use Master pages to create design consistency • Understand PDF options	8
	Total	36

COURSE OVERVIEW:

The course imparts basic knowledge on Graphic design and general understanding to improve the digital skills in the realm of architecture.

COURSE LEARNING OBJECTIVES:

- This course provides an introduction to the principles and practices of graphic design to architecture students.
- Students will learn design principles, digital tools, and problem-solving skills to create effective and aesthetically pleasing designs for different audiences and contexts.

COURSE OUTCOMES: By the end of this course, students will be able to:

CO1	Apply design principles to create effective and aesthetically pleasing designs.
CO2	Use digital tools and software to create and edit graphic designs.
CO3	Analyze and evaluate design choices to create effective designs.
CO4	Design for different audiences and contexts, considering factors such as culture, language, and accessibility.
CO5	Develop effective communication skills to present and explain design choices to clients and Understand ethical issues in design, such as copyright infringement and design plagiarism.

COURSE CONTENTS:

Unit – I

Introduction to Graphic Design, Principles of Graphic Design. RGB vs CMYK

Raster Graphics and Vector Graphics, Typography, Understanding graphic / image formats (TIFF, JPEG, EPS. Etc.), Multimedia Devices like scanners, printers, Cameras etc., Page layout and Composition grids, Illustration techniques, Portfolio design and formats

Unit – II

MS- Office , Word - Creation of Text Documents for various purposes, Excel - Creation of spread sheets, usage of formula, filters and etc.,, PowerPoint – Making of Multimedia presentations

Unit – III

Digital Illustration – Corel Draw, Introduction to Vector Graphics, Logo Design

Stationary Design (visiting card, letter head etc.,) , Poster Design, Brochure Design

Unit –IV

Image Editing – Adobe Photoshop, Introduction to Raster Graphics, Architectural Plan Rendering, Architectural Elevation Rendering, Making of Web page, Usage of Actions, Filters and Etc.,

Unit –V

Print and Interactive Publishing – Adobe InDesign, Create basic page elements

Learn about styles and how they impact productivity, Use Master pages to create design consistency, Understand PDF options

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR 116 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	2	2	3	1	0	0	0	3	2	2	3	2	2	1
CO2	3	3	1	2	2	2	1	0	0	0	3	2	2	3	2	2	1
CO3	2	1	3	2	2	3	1	0	0	0	3	2	2	3	2	3	1
CO4	3	3	2	2	2	1	1	0	0	0	3	2	2	3	1	2	1
CO5	2	2	3	2	2	3	1	0	0	0	3	2	2	3	2	2	1
Total	10	12	12	8	8	12	6	0	0	0	15	8	10	15	7	7	5

AR 117: (C16) VISUAL ARTS

Studio Periods/Week :4
Studio Periods / Semester :72
Credits :4
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (LabPractical Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods
1	Unit–I (a) Essentials of model-making, (b) Survey of various materials & (c) Three dimensional models.	16
2.	Unit – II (Study of strength and properties of model making materials)	12
3.	Unit – III (Visual Presentation)	16
4.	Unit – IV (Visual Composition)	16
5.	Unit – V (Architectural material studies)	12
	Total:	**72**

Note: Visual Arts – Practical Examination - 3 hrs duration

1) The question paper to be set by external examiner in coordination with internal examiner (Paper setting remuneration shared equally by both)
2) Student's examination answers outcome are the models etc. to be taken for evaluation mentioning Hall Ticket Number only and submit to the concerned.
3) Outcome evaluation method is as follows:

Procedure followed	:10Marks
Final outcome	:30Marks
Viva	:10Marks
Total	**:50Marks**

COURSE LEARNING OBJECTIVES:

- To gain knowledge regarding layout of utilities and services in the building envelope, functioning of service and their applications in building.
- To understand the Building Services and Utilities generally installed in buildings and their role in enhancing utilitarian value of the buildings.
- To understand the basic working, principles, terms and definitions, as well as gain knowledge in practical aspects and solutions utilized in architecture.
- To gain knowledge of the Building lighting systems and lighting calculations
- To understand the Principles of Air-conditioning

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Demonstrate an understanding of the basic principles of model making, including scale, proportion, materiality, and construction techniques.
CO 2	Create accurate and precise scale models of buildings and architectural elements using a variety of materials and tools.
CO 3	Use model making as a tool for design exploration, ideation, and communication, and articulate their ideas through well-crafted models
CO 4	Develop critical thinking skills and the ability to analyze and evaluate the effectiveness of their models in conveying design concepts
CO 5	Demonstrate proficiency in model making techniques, including cutting, shaping, joining, and finishing materials, and employ appropriate safety protocols when working with tools and equipment
CO 6	Collaborate effectively with peers in the planning, design, and execution of model making projects, and communicate their ideas clearly and professionally in group presentations

COURSE CONTENTS:

Unit - I

Essentials of model-making: Understanding of various tools and machines employed, best practise involved in handling & operating the tools and the techniques.

Survey of various materials available for model making such as papers, mount boards& paper-boards, wood (local available or balsa woods), plastics, acrylic, films (x-ray, transparent laminates or sheets), plaster of Paris (POP), Styrofoam, wax, metals, glass, Ethoflex any adoptable material conveying proper expression of intended. and exploring their potential in model-making

Three dimensional models: Making and involving the basic solids and abstract sculptures using various techniques/ materials such as POP, wire/ match stick, soap, clay etc., involving the principles of art.

At least three major assignments involving the individual students to fabricate

a) Form and compositionabove three materials

b) Any two objects making with above three materials

c) Composition with solid and void above three materials

d) Any one existing monument. above three materials

Unit - II

Study of strength and properties of model making materials:

Selection of two/Three materials used in everyday life (Textiles, Fabrics, Earthenware, Terracotta, Metals, Stone, Plastic, Glass etc.) Study of properties, Strength, and application.

Exercises : At least two assignments involving the individual students to fabricate

bridges, house and any shelter forms.

Unit - III

Visual Presentation:

Sketching & visual representation of material in various media, like Paper, clay, plaster, wood, wire, wax, photography.

At least three major assignments involving the individual students to fabricate

Unit – IV

Visual Composition:

Basic shapes various materials involved strength and form, colour and texture.

At least three major assignments involving the individual students to fabricate

Unit - V

Architectural material studies:

Handmade – objects / lettering/ joinery /structure of own choice with various materials studied.

At least two major assignments involving the individual students to fabricate

COURSREFERENCE BOOKS:

1) Moore, Fuller. Concepts and practice of Architectural Day Lighting. Van Nostrand Reinhold co., New York, 1985.

2) **Valia, Anil.** Designing with light: A Lighting H.B. International Lightning Academy, Mumbai, 2002, Architecturl Physics: Lighting.

3) **Hopkinson R.G,** Her Majestrip stationery office, London.

4) **David Egan. M,** concepts in Architectural lighting Mc Grew Hill Book company, New York, 1983.

5) **Electrical wiring and Contracting (Vol.1 to Vol.4),** London The New era Publishing Company.
6) **Dr. Frith Abnwos and others,** Electrical Engineering hand Book.
7) **William. J. Guinnesss,** Mechanical and electrical Equipment for Buildings, New York: Willey.
8) **Bovay. H.E.,** Handbook of Mechanical and Electrical Systems for Buildings New York: MC Graw Hill.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR117 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	1	2	1	2							1	-	-	3
CO2	1	3	3	2	2		1							-	-	-	3
CO3	2	3	2	2	2	1	1				1			-	-	-	3
CO4	2	2	2	2	2	1	1				1			1	-	-	3
CO5	2	3	2	2	1	2	1							1	-	-	3
Total	10	15	12	09	09	05	06	-	-		02	-		03	-	-	15

AR 118: (C16) BASIC DESIGN

Studio Periods/Week : **9**
Studio Periods/Semester : **162**
Credits : **9**
Internal Assignments & Mids. : **200 Marks**
External Examinations : **200 Marks**
Total Marks : **400 Marks**
Duration of Exam : **6 (3+3) Hrs (University Drawing Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks End Exam	essay questions End Exam
1	Unit – I Introduction to design	20	25	1
2	Unit – II (Elements of design)	24	50	2
3	Unit – III (Developing compositions in two dimensional designs)	24	25	1
4	Unit – IV (Concepts of geometry)	24	25	1
5	Unit – V (Developing compositions in three dimensional designs)	24	25	1
6	Unit – VI (Colour theory & Theoretical inputs to be followed)	24	25	1
7	Unit – VII (Study of ornamentation in architectural design)	22	25	1
Total:		**162**	**200**	**8**

COURSE OVERVIEW:

Basic Design provides the framework for understanding design as a new language by sensitizing students to the conceptual, visual and perceptual issues involved in the design process.

EXPECOURSE LEARNING OBJECTIVES:

- To impart an understanding of principles of composition, and to appreciate design and design elements.
- Exercises complement the lectures and ensure that the students learn to develop a series of compositions in two and three dimensions.

COURSE OUTCOMES:

CO1	Students should be able to known fundamentals of design principals and elements of design by using two dimensional compositions. examples from natural natural and man-made environments
CO2	Students should be able to create logos, cover page, collage, mural, floor patterns.
CO3	Students should be able to learn Importance of - Transformations to three dimensional forms; Explorative exercises in three dimensional compositions.
CO4	Students should be able to create Colour theory and translate abstract principles into two and three dimensional compositions.
CO5	Students can understand a detailed Study of ornamentation in architectural design and they analyze the work.

COURSE CONTENTS:

Unit – I

Introduction to design –importance of design; Study and appreciation of design examples from natural and man-made environments

Unit – II

Elements of design: point, line, shape, form, space, texture, value, colour and material; Introduction to the principles of composition: unity, balance, symmetry, proportion, scale, hierarchy, rhythm, contrast, harmony, focus, etc; Application of the principles of composition in two dimensional compositions; Transformations in two dimensions: shapes and patterns; use of grids in creating repetitive patterns; Principles of composition-using grids, symmetrical /asymmetrical, rule of thirds, centre of interest etc. Explorative exercises in two dimensional compositions.

Unit - III

Developing compositions in two dimensional designs like- logos, cover page, collage, mural, floor patterns, grills, railings, gates etc.

Unit - IV

Concepts of geometry –different three dimensional forms, primitive forms and understanding the behavior when combined- Transformations to three dimensional forms; Explorative exercises in three dimensional compositions.

Unit - V

Developing compositions in three dimensional designs like- Entrances, gateways, portal, compound walls built-in furniture etc.

Unit - VI

Colour theory, color wheel, primary, secondary, tertiary colors, color schemes, color value and intensity. Theoretical inputs to be followed by exercises to develop the ability to translate abstract principles into two and three dimensional compositions.

Unit - VII

Study of ornamentation in architectural design; Different types of ornamentation in buildings; Study and evaluation of artifacts and historic examples and their applicability Exercises in related to documentation of artifacts at historical sites and to understand them with respect to the surround environment; to transform the designs to present context or usage.

REFERENCES BOOKS:

1) **Wucius, Wong.** Principles of two Dimensional Design. Van Nostrand Reinhold 1972.
2) **Maier Manfired** Basic Principles of Design, Vol.1, 2, 3• & 4, Van Nostrand Reinhold, NY. (1977)
3) **Ching, Francis D.K.** Architecture: Form, Space, and Order, 2nd ed. Van Nostrand• Reinhold, New York, 1996**.**
4) **Hanks, A. David.** Decorative Designs of Frank Lloyd Wright, Dover Publications, Inc.• New York, 1999**.**
5) **Hepler, E. Donald, Wallach, I. Paul**. Architecture Drafting and Design, 3rd ed.• McGraw-Hill Book Company, New York, 1977.
6) **Itten, Johannes.** Design and Form: The basic course at the Bauhaus, Thames and• Hudson Ltd., London 1997.
7) **Krier, Rob.** Architectural Composition, Academy Editions, London, 1988.•
8) **Meiss, Pierre Von**. Elements of Architecture: From form to place, E and FN Spon,• London, 1992.
9) **Pipes, Alan**. Drawing for 3-Dimensional Design. Thames and Hudson Ltd., London• 1990.
10) **Shibikawa, Ikuyoshi and Takahashi, Yumi**. Designers Guide to Colour.•
11) **Smithies, K.W.** Principles of Design in Architecture. Chapman and Hall, 1983.

COURSE OUTCOMES:

Courses Out Comes: AR 118 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	2	1	3	1	2							3	-	-	3
CO2	1	2	1	3	2		3					3		3	-	-	3
CO3	2	2	1	3	1	3	3		1	3	1			3	-	-	3
CO4	1	1		1		3	1							3	-	-	3
CO5	2	3	2	3	1	2	1	1				1		3	-	-	3
Total	07	11	6	11	07	09	10	1	1	3	02	4		15	-	-	15

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AR 121(C16): ARCHITECTURAL DRAWING AND GRAPHICS- II

Periods / Week :04
Periods / Semester :72
Credits :04
Internal Assignments & Mids. :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Exam, Drawing & Theory)

TIME SCHEDULE

S.No.	Major Topics	No. of periods	Weightage of marks	No of short ans. questions	No of essay ans. questions
1.	Unit_I (Orthographic Projection)	8	10	-	1
2.	Unit-II (Isometric, Axonometric, Oblique views).	12	15	1	1
3.	Unit-III (Mouldings and Arches)	8	5	1	-
4.	Unit-IV (Ionic Volute)	2	10	-	1
5.	Unit-V (Entasis of Column)	2	5	1	-
6.	Unit-VI (Architectural Documentation , Plan, Sections & Elevations)	16	15	1	1
7.	Unit-VII (Perspectives - One Point and Two point)	24	10	-	1
	TOTAL	**72**	**70**	**4**	**5**

Note:

1) Duration of examination is for 3 hours

2) Part A: 4 questions – each question carries 5 marks all 4 to answer and no choice

3) Part B: 3 questions have to be answered out of 5 questions 2 are choice each question carries 10 marks

COURSE OVERVIEW:

The course is intended to develop the techniques of architectural drawing pertaining simple and complex solid geometrical forms of Building geometry Documentation.

COURSE LEARNING OBJECTIVES:

- The course is intended to develop the techniques of architectural drawing pertaining simple.
- complex solid geometrical forms of Building geometry Documentation.
- To impart the skills of three dimensional visualization and presentation.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Drafting of lines – learning the types of lines
CO 2	Analyzing the projections and views of shapes
CO 3	To Learn how to draw arches and moldings
CO 4	To learn documentation of monumental building [Any historical building]
CO 5	To learn the technical views of 1 point, 2 point, 3 point perspectives

COURSE CONTENTS:

Unit I :

Concept of Orthographic Projections: Concept of Orthographic Projections, Introduction. To projections of basic elements like point, lines, planes and solids with reference to HP and VP. Drawing of relevant simple compositions in plan and all elevations, Sections and true sections of all types of solids in different positions, Development of lateral surface of all types of solids,

Unit II

Concept of Isometric &Axonometric projections / views: Understanding concept of Isometric scale, Drawing of Isometric views of all simple solids, including few of interesting compositions of building elements like column, beam and slabs etc.

Unit - III

Use of circle in moulding: Ovolo, Covetta, Ogee, Lancet, Horse shoe, Moorish, Stilted and Rampant, Tudor, three centered and drop. Exercise of Ionic volute, Entasis of column etc., working with models to facilitate with visualization.

Unit - IV

Architectural Documentation: Methods of measurement of interior and exterior spaces, Building Elements, Detailed measured drawing and documentation of any interesting building – preparation of maps, plans, elevations, sections, views etc

Unit - V

Perspective Drawing Perspective by Side Elevation Method, Angular Perspective (Two Point Perspective) and Parallel Perspective (One Point Perspective), Perspective of different Solids and Building elements, Perspectives having more than 2 Vanishing Points. Perspectives of simple geometric solids and spaces and complex geometries. Introduction to three point perspective.

REFERENCE BOOKS:

1) Thomas, E. French. Graphic Science and Design, New York: MC Graw Hill. Nichols,
2) T.B. and Keep, Norman. Geometry of Construction, 3rd ed.
3) Cleaver – Hume Press Ltd., London, 1959.
4) Bhatt, N.D. and Panchal V.M. Engineering Drawing: Plane and Solid Geometry, 42nd ed.
5) Charotar Pub., Anand, 2000. Gill, P.S. T.B. of Geometrical Drawing,
6) 3rd ed. DewanSuhil Kumar Kataria, Ludhiana, 1986. Shah, M.G., Kale, C.M. and Patki, S.Y. Building Drawing: with an integrated approach to built environment,
7) 7th ed. Tata McGraw Hill Pub., Delhi, 2000. Claude Batley -Design Development of Indian Architecture Ernest Burden -Architectural Delineation.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR 121 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	2	1	1	2	1	-	1	3	2	1	1	-	-
CO2	1	3	1	3	1	2	1	1	-	1	-	2		1	1	-	-
CO3	3	2	2	3	1	2	1	1	1	1	1	3	1	2	3	-	2
CO4	3	2	2	3	2	1	1	1	1	1	1	3	1	1	2	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	2	-	1	1	-	1
CO6	1	2	2	2	1	-	1					1		-	-	-	-
Total	13	15	11	16	08	08	06	07	03	03	03	14	04	06	08	-	6

AR 122(C16): WORLD ARCHITECTURE

Periods / Week :3
Periods / Semester :54
Credits :3
Internal Assignments & Mids :50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I (Purpose and relevance of art etc.)	3	10	1	1
2.	Unit – II (Exploration of art forms)	6	8		1
3.	Unit – III (Various factors influencing the architecture)	6	10	1	1
4.	Unit – IV (Introduction to Ancient World Architecture)	6	16	-	2
5.	Unit – V (Early Mesopotamian Architecture etc.)	6	10	1	1
6.	Unit – VI (Greek Architecture)	9	10	1	1
7.	Unit – VII (Roman Architecture)	9	10	1	1
8.	Unit – VIII (Early Christian Architecture)	9	8		1
TOTAL:		**54**	**74**	**5**	**8**

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

Providing knowledge on traditional art form, innovations and influences on architecture and thinking process in design; intended to provide brief background knowledge about the architecture in different parts of the world.

COURSE LEARNING OBJECTIVES:

- To analyze various art forms, and understand the techniques involved in creative thinking.
- To bring out the importance of timelessness of architecture and emphasize it.
- To undertake a chronological study of world architecture and a compare the different stages of developments in the parts of the world through the same.
- Linking the architectural study with the social developments of civilizations, geographical and geological factors, materials and structures etc.
- To understand the detail of architectural elements in buildings of historical importance through sketching and labelling of details.
- At the end of the course the students will be able to achieve different skills for creative thinking, understanding various art forms, and appreciate art and architecture from the past through learning examples from the same.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Learning about the perception of art in history from past to present.
CO 2	Relating the comparison of traditional and contemporary art, evaluation from history and analysis.
CO 3	Influence of architecture on environment and the importance of vernacular architecture reflecting sustainability.
CO 4	Analysis and evaluation from past settlements in history through different examples.
CO 5	Understanding the techniques of construction and design strategies in previous examples /buildings of architectural importance in world history.
CO6	Learning throughbuilding techniques, founded on a comprehensive understanding of the materials, and construction methods in historical buildings.

CO7	Understanding Architectural Design through the study of columns as an order followed, and analogy in design through mathematical study of proportions in columns.
CO 8	Analysis and understanding of building envelope, in different typology of buildings. Examples of different systems, their structural analysis of services provided for public buildings, techniques used according to site availability in construction.

COURSE CONTENTS

Unit – I

Purpose and relevance of art, Development of art; A survey of history of art forms; pre-historic period to the present times; Changing nature of art through time in terms of content; form and material.

Unit – II

Exploration of art forms - study of traditional and contemporary art forms - painting sculpture, architecture, decorative arts, design arts, digital art. Relationship between art and architecture from earliest times.

Unit – III

Various factors influencing the architecture of a region, architecture as a response to social, technological and environment forces. Evolution of shelter forms in regions of the world and examples of vernacular architecture in the world, with particular reference to India. Various subjects to be learnt by architecture students, their relevance to practice.

Unit – IV

Introduction to Ancient World Architecture. A brief outline of the Neolithic revolution and its impact on built forms – brief study of a few ancient settlements – Jericho, Catal Huyuk, Hassuna, Koln-Lindenthal & Skara Brae. Egyptian Architecture: Evolution of Pyramids & cult temples.

Unit – V

Early Mesopotamian Architecture: Eg. Ziggurat of Urnammu, Ur. Mayan Architecture: Eg. Step Pyramid Complex, Tikal. Assyrian Architecture: Eg. Palace of Sargon, Khorsabad. Persian Architecture: Eg. Palace at Persepolis. A comparative study of all the styles of the ancient world.

Unit – VI

Greek Architecture: Important construction techniques, Visual refinement (Optical correction), Appreciation of perfection,The Greek Orders, Brief description of the urban spaces, temples & other public buildings, Greek houses etc.. Eg: Agora, Acropolis, Parthenon, Erechtheion & Theatre at Epidaurus - all in Athens.

Unit – VII

Roman Architecture: A brief account of materials, Different typologies of buildings ,structural systems adopted and construction techniques - The Roman Orders - a short description of Roman urban spaces, temples, thermae, basilicas, theatres, amphitheaters, circuses & houses, Grand scale, development of roads and aqueducts.

Unit – VIII

Early Christian Architecture: Evolution of church form, surface treatment and materials of construction. Eg.: St. Clement, Rome. Byzantine Architecture: Technique adopted to construct ;domes over rooms which are square in plan. General structural systems, surface treatment and materials of construction. Renaissance and Baroque: techniques and building typologies used.

ASSIGNMENTS:

Written assignment to be taken from the questions framed from the units above and also

Sketches to be done of famous historical buildings which are of great importance, with labelling of parts and construction techniques.

COURSREFERENCE BOOKS:

1) **Craven, C. Roy.** Indian Art a Concise History.
2) **Kumar, Raj (Ed.).** Essays on Indian Art and Architecture. Discovery Pub., New Delhi, 2003.
3) **Fisher, E. Robert.** Buddhist Art and Architecture. Thames and Hudson, London, 1993.
4) **Ghosh, A (Ed.).** Jain Art and Architecture Vol. 1-3. Bhartiya Jnanpith, New Delhi.
5) **Christopher Alexander,** Pattern Language, New York: Oxford University Press
6) **Thomas Mitchell,** Redefining Designing: From to Experience.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR122(C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	1	3	3	2	2	-	1	1	-	1	-	2	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	-	-	1	2	-	-	1	-	3
CO4	2	2	2	2	2	1	1	3	-	-	1	1	-	1	-	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	3	-	1	-	1	3
CO6	3	2	-	3	1	-	3	1	-	-	-	1	1	-	-	1	-
CO7	2	1	-	1	1	3	2	1	-	-	-	1	-	-	-	1	-
CO8	1	1	-	2	-	1	1	-	1	-	-	-	-	-	-	1	-
Total	14	18	12	09	09	05	06	11	01	03	02	13	02	03	02	03	15

AR123(C16) : BUILDING MATERIALS-II

Periods / Week :3
Periods / Semester :54
Credits :3
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	**Unit – I** (Laminates &Veneers)	6	8		1
2.	**Unit – II** (Paints &Varnishes)	8	10	1	1
3.	**Unit – III** (Glass)	8	10	1	1
4.	**Unit – IV**(Plastics)	6	10	1	1
5.	**Unit – V** (Floorings)	10	18	1	2
6.	**Unit – VI** (Roof coverings)	8	8		1
7.	**Unit – VII** (Miscellaneous materials)	8	10	1	1
	Total:	**54**	**74**	**5**	**8**

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course is intended to provide information on the properties, uses, installation and costs of building materials. The course highlights on Mechanical and physical properties of various materials. Influence of various factors on these properties.Causes of defects, their prevention and remedies. Testing of materials.

COURSE OBJECTIVES:

- To provide knowledge on the various types of building materials used while highlighting the current innovations and trends.

EXPECTED SKILLS / KNOWLEDGE TRANSFERRED:

Knowledge required for specifying appropriate materials for various spaces in buildings**.**

COURSE OUTCOMES:

CO1	To understand a detailed study of Laminates and Veneers and make effective reports to gain fundamental knowledge.
CO2	To learn fundamentals of paints and varnishes, their types and application
CO3	To learn Importance of glass, glass products, and their Properties and types and the application.
CO4	To develop basic knowledge on plastics, its properties and application to buildings.
CO5	To analyze the function, technical requirements of floorings, roofs and materials required for a building.

COURSE CONTENTS:

Unit – I

Laminates and Veneers: Resin bonded ply wood, types of laminates, laminated wood, insulating boards and other miscellaneous boards, veneers from different varieties of timber, their characteristics and uses MDF& HDF Boards.

Unit – II

Paints and Varnishes: Protective coating, paints, constituents of paints, their functions, water paints, distempers, and cement based paints, emulsion paints, selection of paints, and storage of paints.

Types varnishes (oil and spirit): characteristics and uses of varnishes. French polish, anti-corrosive paint, damp proofing finishes.

Unit – III

Glass and glass products: Composition and fabrication of glass, types of glass, wired glass, fiber glass, rock wool, laminated glass, glass-crete blocks, structural glass, their properties and uses in buildings.

Unit – IV

Plastics: Polymer types, thermo setting and thermo plastics Resins, types of moldings, ,polymerization and condensation,

Composite materials, classification, properties and uses - linoleum, plastic coated paper, reinforced plastic, PVC.

Unit – V

Floorings : Introduction, essential requirements of a floor, factors affecting selection of flooring material, Various natural as well as artificial flooring materials like brick, flag stone, tiled ,cement concrete, granolithic, terrazzo, marble, Shahabad stones timber flooring, timber floor supported on RSJ ,flag stone floor resting on RSJ,, vitrified tiles, ceramic tiles, , Mosaic, rubber, Linoleum, and PVC and PVA flooring

Unit – VI

Roof Coverings: Introduction, requirements of good roof technical terms, classification, types of roof coverings for pitched roof. **:** Roofing tiles and roofing with cement products like A.C. sheet roofs, G.I. Sheets roofs, slates.

Unit – VII

Special Treatments for Materials and Buildings: Properties and uses of Asbestos, cork, felt, mica, adhesive, Bakelite, china clay, fiber glass, leather, canvass, jute, rubber, Asphalt and Bitumen

Fire resistant, waterproofing, thermal insulation, acoustical treatment and anti-termite treatment.

REFERENCE BOOKS:

1) **Chowdary, K.P.** Engineering Materials are used in India, 7th ed. Oxford and IBH Pub. Ltd., New Delhi, 1990.
2) **Moxley, R. Mitchell**‟s Elementary Building Construction, Technical Press Ltd.
3) **Rangwala, S.C.** Building Construction: Materials and types of Construction, 3rd ed. John Wiley and Sons, Inc., New York, 1963.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR 123 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1		2							3		3	-	-	3
CO2	3	2		1	2							3		3	-	-	3
CO3	3	2	1						1	3	1	1		3	-	-	3
CO4	3	2		1	2							3		3	-	-	3
CO5	3	1	1		2			1				3		3	-	-	3
Total	15	09	03	02	08			1	1	3	01	13		15	-	-	15

AR124(C16) : BUILDING CONSTRUCTION- II

Subject Title	**:Building Construction - II**
Subject Code	**:AR-124(C-16)**
Studio Periods/Week	**:4**
Studio Periods / Semester	**:72**
Credits	**:4**
Internal Assignments & Mids	**:50 Marks**
External Examinations	**:50 Marks**
Total Marks	**:100 Marks**
Duration of Exam	**:5 Hrs (University Drawing Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit–I (Carpentry & joinery)	10	10	1	1
2.	Unit – II (Doors)	10	10	1	1
3.	Unit – III (Windows)	8	8		1
4.	Unit – IV (Steel windows etc.)	10	10	1	1
5.	Unit – V (Wooden ground & upper floors)	8	8		1
6.	Unit – VI (partition walls)	8	10	1	1
7.	Unit – VII (stair cases)	18	18	1	2
	Total:	**72**	**74**	**5**	**8**

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course introduces to the methods and techniques of construction of doors and windows, stairs and partitions of a building using different materials.

EXPECOURSE LEARNING OBJECTIVES:

To understand the elementary and simple construction methods like joinery details in wood ,fixing of hardware.

COURSE OUTCOMES:

CO1	Students can understand a detailed study of timber and various types of joints. and they create technical Drawings for Various Types of joints, Jambs
CO2	Students should be able to known fundamental of doors and types. and they create technical Drawings for Various Types of doors.
CO3	Students should be able to learn Importance of windows and the construction details and they create technical Drawings for Various Types of windows.
CO4	Students should be able to reinforced concrete structure Mixing methods at site, their problems
CO5	Students should be able to known fundamentals of Wooden ground and upper floors.and they create technical Drawings for different floors.
CO6	Students can understand a detailed study of Partition Walls.
CO7	Students should be able to known fundamentals of Staircase & functional Terminology and types of staircases. and they create technical Drawings for Various types of Staircase.

COURSE CONTENTS:

Unit - I

Carpentry and joinery: Terms defined; mitring, ploughing, grooving, rebating, veneering. Various forms of joints in wood work, such as lengthening joints, bearing joints, halving, dovetailing, housing, notching, tusk and tenon etc;

Unit - II

Doors: Definition of terms, types of doors: wooden, ledged, ledged and braced, paneled, flush door. Hinged, single and double shutters, sliding, folding, revolving, pivoted.

Unit - III

Windows: Casement, top and bottom hung, pivoted and sliding sash. Hardware: fixtures, locks, hinges, fastenings for doors and windows.

Unit – IV

Steel: windows, rolling shutters and grills. Aluminium doors and windows.

Unit - V

Wooden ground and upper floors: Terms defined, bridging joists, binding joists, binders, beams and girders, solid and herring bone strutting, floor boards, ceiling joists, trimming floors to accommodate fire place. Details of fire place.

Unit – VI

Partition Walls: Brick partition, reinforced brick partition, brick nogged partition, lath and plaster partition, pre-cast concrete partition, glass block and glass create partition, common wooden partition, trussed partition.

Unit – VII

Staircases: Terms defined, Tread, riser, stringer, nosing, flight, landing, head room, handrail, balusters, newel post etc., types of stairs i.e., straight, doglegged, open well, geometrical, circular, spiral, bifurcated, wooden stairs, stone stairs, metal stairs and elementary knowledge of R.C.C. stairs.

REFERENCES BOOKS:

1) **Barry, R.** The Construction of Buildings Vol. 2, 5th ed. East-West Press. New Delhi, 1999.
2) **Bindra, S P. and Arora, S P**. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.
3) **Hailey and Hancork, D.W**. Brick Work and Associated Studies Vol. 2. MacMillan, London, 1979.
4) **Moxley, R. Mitchell's** Elementary Building Construction, Technical Press Ltd.
5) **Rangwala, S.C.** Building Construction, 22nd ed. Charotar Pub. House, Anand, 2004.
6) **Sushil Kumar. T.B**. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR 124 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1									3		3	-	-	
CO2	3	2		1								3		3	-	-	3
CO3	3	2	1						1	3	1	3		3	-	-	
CO4	3	2		1								3		3	-	-	
CO5	3	1										3		3			
CO6	3	1										3		3			
CO7	3	1	1					1				3		3	-	-	3
Total	21	11	03	02				01	01	03	01	13		21	-	-	06

AR125(C16) : STRUCTURAL MECHANICS

Periods / Week :4
Periods / Semester :72
Credits :4
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I (Simple stress & strain)	6	10	1	1
2.	Unit – II (Moment of inertia)	10	10	1	1
3.	Unit–III (S.F& B.M for SSD)	16	16		2
4.	Unit–IV (Shear Stress - Beams)	10	8	-	1
5.	Unit–V (Columns and struts)	10	10	1	1
6.	Unit–VI (Deflection- beams)	10	10	1	1
7.	Unit – VII (Arch & Dome)	10	10	1	1
	TOTAL:	**72**	**74**	**5**	**8**

Note:

1) Final exam question paper consists of PART-A for 10 marks which consists 5 short questions all 5 to answer no choice and each one carries 2 marks & PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

Gives an in-depth understanding of the concepts associated with different Elements of Structures.

COURSE LEARNING OBJECTIVES:

- Understand the basic concepts of stress, strain and their relations based on linear elasticity.
- Know the material behaviors due to different types of loading.
- Understand and know how to develop shear moment diagrams of a beam and find the maximum moment and shear at their locations.
- Understand how to calculate centroid and moment of inertia of different cross sections.
- Understand how to calculate normal and shear stresses.

COURSEOUTCOMES: At the end of the course, the student will be able to

CO1	Analyse the behavior of solid bodies due to various types of loadings.
CO2	Apply knowledge of materials and structural elements to the analysis of simple structures.
CO3	Undertake problem identification, formulation and solution using a range of analytical methods.
CO4	Analyse and interpret laboratory data relating to behavior osf structures and materials there are made of.
CO5	Expectation capacity to undertake life long learning.

COURSE CONTENTS

Unit – I

Simple stress and strain: Introduction Forces, system of forces, Stress, Strain, type of stresses, stress-strain cure ,Hooke's law, elastic constants, relationship between the elastic constants

Unit – II

Centroid &Moment of inertia: center of gravity for simple figures M.I for various structural shapes like rectangle, triangle, and circle.

Unit – III

Shear force and Bending moment : bending equation M/I=F/Y=E/R types of beams and loads, shear force and bending moment for cantilever and simply supported beam for static loads(analytical methods),Applications of different beams

Unit – IV

Shear Stress in Beams: Derivation of basic torsion equation T/J=G/I=Fs/R shear stress distribution for various shapes like rectangle, triangle, circle,

Unit – V

Columns and struts:

Buckling and crushing failures, types offend condition, Euler's theory of long columns for different end conditions, Euler's theory of long columns for different end conditions and equivalent length , rankles equations application of basic formulas.

Unit – VI

Deflection of beams: slope deflection for cantilever and SSB with standard loading, slope deflection for cantilever and SSB with standard loading using double integration method, Macaulay's method and moment area method.

Unit –VII

Execution of structural concepts in post and lintel constructions and arch, Dome, live study report of construction site and possible difficulties during constructions.

REFERENCE BOOKS

1) **Khurmi. R.S.** Engineering Mechanics, S. Chand and Co. Ltd., New Delhi, 1999.
2) **Ramamrutham. S.** Engineering Mechanics, 7th ed. Dhanpat Rai Pub. Co. Ltd., Delhi, 2004.
3) **Timoshenko. S. and Young, D.H.** Engineering Mechanics, McGraw-Hill International Editions.

COURSE OUTCOMES VS PO_S AND PSO_SMAPPING:

Course Out Comes AR125 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	1	_	_	_	_	_	_	_	_	_	1	3	1	1
CO2	3	3	2	1	_	_	_	_	_	_	_	_	_	1	3	1	1
CO3	2	3	3	1	_	_	_	_	_	_	_	_	_	1	3	1	1
CO4	2	3	3	1	_	_	_	_	_	_	_	_	_	1	3	1	1
CO5	3	3	2	1	_	_	_	_	_	_	_	_	_	1	3	1	1
Total	13	15	12	05	_	_	_	_	_	_	_	_	_	5	15	5	5

AR126(C16) : ADVANCED MODEL MAKING

Subject Title	**:Advanced model making**
Subject Code	**:AR-126(C-16)**
Studio Periods/Week	**:4**
Studio Periods / Semester	**:72**
Credits	**:4**
Internal Assignments & Mids	**:50 Marks**
External Examinations	**:50 Marks**
Total Marks	**:100 Marks**
Duration of Exam	**:3 Hrs. (Lab Practical Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods
1	Unit–I (Introduction of advanced model making)	16
2.	Unit – II (Carpentry)	16
3.	Unit – III (Creative model making)	16
4.	Unit – IV (Scale model making)	16
5.	Unit – V (Photographical Presentation)	8
	Total:	**72**

Note:

Advanced Model Making – Practical Examination - 3 hrs duration

1) The question paper to be set by external examiner in coordination with internal examiner (Paper setting remuneration shared equally by both)
2) Student's examination answers outcome are the models etc. to be taken for evaluation mentioning Hall Ticket Number only and submit to the concerned.
3) Outcome evaluation method is as follows:
   a. Procedure followed :10Marks
   b. Final outcome :30Marks
   c. Viva :10Marks

   Total **:50Marks**

COURSE LEARNING OBJECTIVES:

- To gain knowledge regarding layout of utilities and services in the building envelope, functioning of service and their applications in building.
- To understand the Building Services and Utilities generally installed in buildings and their role in enhancing utilitarian value of the buildings.
- To understand the basic working, principles, terms and definitions, as well as gain knowledge in practical aspects and solutions utilized in architecture.
- To gain knowledge of the Building lighting systems and lighting calculations.
- To understand the Principles of Air-conditioning.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Apply advanced model making techniques to produce high-fidelity, detailed and complex architectural models that accurately represent the design intent.
CO 2	Apply their knowledge of lighting, color theory, and visual communication to create compelling and engaging models that effectively convey design concepts to a range of audiences.
CO 3	Collaborate effectively with designers, engineers, and other stakeholders in the design and fabrication of models, and communicate their ideas and contributions in a professional and collaborative manner.
CO 4	Engage in a reflective and iterative design process, using model making as a tool to explore and refine design concepts and strategies.
CO 5	Develop an awareness of the ethical and sustainable implications of model making, including the responsible use of materials, energy, and resources in the fabrication of architectural models
CO 6	Demonstrate proficiency in project management, including time management, budgeting, and scheduling, and effectively manage complex model making projects from concept to completion

COURSE CONTENTS:

Unit : I

Introduction of advanced model making:

Studiy of various machines like laser cutting, model making machine jig-jag machine and etc.,

Exercises : At least two assignments involving the individual students to fabricate

bridges, house and any shelter of animals

Unit : II

Carpentry : Introduction to the use of different types of tools and different types of joints used in carpentry. Joinery details which are commonly used in timber construction. Application of surface finishes such as polish varnish, lacquer on wood& various types of veneers.

At least three major assignments involving the individual students to fabricate

a) Scale model of a piece of furniture. b) Presentation of models.
b) Mock-up of an everyday object. d) Three-dimensional forms etc.

Unit :III

Creative model making: Model making with scrape, paper, glass, cardboard, thermo Cole, acrylic and withany adoptable/relevant/applicable using relevant tools.

At least Two major assignments involving the individual students to fabricate

Unit : IV

Scale model making: Comprehensive Scale models of Pitched roof house /Bus shelter / Vehicles/Sentry cabin/Ice cream parlour/Exhibition stall/Coffe or Tea Stall/RTC Ticket Cabin/Filling Station/Gazebo/Counters. With the materials of Ethoflex, Mount board, Acrylic sheet, Glass, any adoptable material using the relevant tools.

At least four of different major assignments involving the individual students to fabricate.

Unit : V

Photographical Presentation: Study of the equipment, processes and procedures necessary for the photography of modals, building exteriors and interiors pertaining to study of views, light and shadow, better picture used for presentations, real visualization of proportions, texture, colour rendering etc.

Exercises to be made at least for three types of models .

REFERENCE BOOKS :

1) **Bernald , S and Copplene, Myers.** History of Art.
2) **Craven, C.Roy.** Indian Art a Concise History.
3) **Krier, Rob.** Element of Architecture. Academy Education, London,1992.
4) **Lang, Jon.** A Concise History of Modern Architecture in India .Permanent Black. Delhi, 2002.
5) **Magnet, Jacque.** The Aesthetic Experiences: An anthropologist looks at the Visual Art.
6) **Preble, Duame.** Art forms.
7) **Snyder, C.James and Catanese,J.Anthony.** Introduction to Architecture
8) **Tapert, Annette. Swid Powell:** Objects by Architects. Rizzoli, New Yerk.1990
9) **Thyagarajan.** Basic practical photography
10) **Ching Francis D.K** -Architecture: Form, Space and Order.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR 126 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	1	2	1	2							1	-	-	3
CO2	1	3	3	1	2		1							-	-	-	3
CO3	2	3	2	2	2	1	1				1			-	-	-	3
CO4	2	2	2	2	2	1	1				1			1	-	-	3
CO5	2	3	2	2	1	2	1							1	-	-	3
Total	10	15	12	09	09	05	06	-	-		02	-		03	-	-	15

AR127(C16) : ARCHITECTURAL DESIGN-I

Studio/Drawing Periods/Week :9
Studio/Drawing Periods/Semester :162
Credits :9
Internal Assignments & Mids :200 Marks
External Examinations :200 Marks
Total Marks :400 Marks
Duration of Exam :6 (3+3) Hrs (University Drawing Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Question
			End Exam	End Exam	End Exam
	Unit-I (Anthropometrics)	18	5	1	-
	Unit-II (Study of functional spaces)	36	10	2	-
	Unit-III Study of the human considerations (a) Introduction to design process. (b) Design Response	36	10	2	-
	Unit-IV Introduction to design process. (a) pre design studies (b) Design Response	72	175	-	1
TOTAL		**162**	**200**	**5**	**1**

Note: (a) For internal assessment:

1) There should be assignments from Major Topics: Unit-I – 1 Question, Unit-II – 2 Questions & Unit-III – 2 questions evaluation is same as End Exam Weightage
2) From Unit-IV - At least two major exercises and two minor design/time problems should be given. The final submission shall necessarily include a model for at least one of the two main problems.

(b) For External/End examination:

1) Duration of End examination is for 6 hours (two sessions)

2) No choice in Part A and B (there will be a question in Part-B on the conceptual plan drawn in single line or double line to be traced and submitted at the end of 1st Session of the examination.

Part-A: 5 short answer questions- each carries 5 marks is to be answered on separate drawing sheet which is to be collected at the end of first session.

Part B: 1 question – i.e., 6th question for 175 marks from one of the topics from Unit-IV.

The tracing of the conceptual plan for question no-6 is to be submitted at the end of the 1st session only and there should not be any alteration in the plan to be submitted finally at the end of 2nd session ie. There should not be major deviations from the conceptual plan submitted through tracing.

COURSE OVERVIEW:

This course is intended to provide framework for understanding design as a process.

COURSE LEARNING OBJECTIVES:

- Intend to provide framework for understanding design as a process.
- To impart knowledge related to design process and introduce various problem-solving approaches.
- To understand the importance of learning human measure/anthropometry and its application in design.
- To develop the ability to translate abstract principles of design into architectural solutions for small problems.
- To learn the importance of analysis of flow diagrams and zoning in design.
- At the end of the course the students will be able to achieve different skills for creative thinking, understanding the importance of human measure and design according to it for various spaces in architectural design learning examples from the same.

COURSE OUTCOMES:

CO 1	Learning about the analysis of proportion and measure in human body and its application in various functional spaces in architectural design.
CO 2	Analyzing and investigating the need of proper space design with functional, aesthetic and behavioral norms relating it to the activity analysis of individual human needs through communication with people required for different activities and understanding their requirements at different levels and places.
CO 3	Formulation of the knowledge acquired from existing studies, comparative analysis from the research done in literature and application of the same to the outcome to acquire solutions to complex design problems.

CO 4	Learning to produce solutions to the design through review process and designing concepts which would include logical thinking, involving the various factors of culture and context which would work for the wellbeing of the occupants, through drawing techniques and architectural illustrations in design.

COURSE CONTENTS:

Unit - I

Anthropometrics: Basic -average measurements of human body in different postures-its proportion and graphic representation, application in the design of simple household and street furniture. Use of mannequins in defining spatial parameter of design.

Unit – II

Study of functional spaces

(a) Functional spaces issues like clearances, lighting and ventilation, furniture arrangements;

(b) Minimum and optimum areas for various functional spaces;

(c) Detailed study of spaces such as living, drawing, family hall, home office, study, dining, master bedroom, children bedroom, parents bedroom, guest bedroom, kitchen, grain store room, utility space, lobby, home theatre, home zim/yoga room, puja/prayer room, attached toilet (wash room), common toilet (wash room) etc.

(d) out house and toilet, Servant room and toilet.

Unit - III

Study of the human considerations like, privacy, convenience, comfort, etc.; Case study of a house and a critical appraisal of the spaces.

Unit - IV

Introduction to design process.

(a) Pre- Design Studies: Preparation of design brief, the user requirement and their implications, Study of the site and the context;

(b) Design Response: Development of concept, Graphic tools like circulation diagrams, Figure Ground studies, etc. Integration of form and function in the design of bus shelter, milk booth, watchman's cabin, traffic police kiosk, flower stall, ATM Center, etc.

Note:

(a) For internal assessment:

There should be assignments from Major Topics: Unit-I – 1 Question, Unit-II – 2 Questions & Unit-III – 2 questions evaluation is same as End Exam Weightage

From Unit-IV - At least two major exercises and two minor design/time problems should be given. The final submission shall necessarily include a model for at least one of the two main problems.

(b) For External/End examination:

3. Duration of End examination is for 6 hours (two sessions)

No choice in Part A and B (there will be a question in Part-B on the conceptual plan drawn in single line or double line to be traced and submitted at the end of 1st Session of the examination.

Part-A: 5 short answer questions- each carries 5 marks is to be answered on separate drawing sheet which is to be collected at the end of first session.

Part B: 1 question – i.e., 6th question for 175 marks from one of the topics from Unit-IV.

The tracing of the conceptual plan for question no-6 is to be submitted at the end of the 1st session only and there should not be any alteration in the plan to be submitted finally at the end of 2nd session ie. There should not be major deviations from the conceptual plan submitted through tracing.

COURSREFERENCE BOOKS:

1) **Chiara Joseph de and Others.** Time Savers Standards of Building Types. McGraw – Hill, 1980.
2) **Kirk, Paul Hayden and Sternberg, D. Eugene.** Doctors Offices and Clinics, 2nd ed. Reinhold Pub., USA, 1960.
3) **Neufert, Ernst.** Ernst Neufert Architects Data, Granada Pub. Ltd., London, 1970.
4) **Pevsner, Nikolaus.** A History of Building Types. Thames and Hudson, London, 1976.
5) Shah, S. Charanjit. Architects Hand Book Ready Reckoner. Galogotia Pub. Co., New Delhi, 1996.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR 127 (C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	2	1	2	2	-	2	2	1	1	1	1	-	3
CO2	3	3	3	2	2	-	1	2	-	2	-	1	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	-	-	1	-	2	-	1	-	3
CO4	2	2	2	2	2	1	1	-	-	-	1	-	1	1	-	-	3
Total	10	11	10	9	8	3	5	5	-	4	4	2	4	2	2	-	12

AR211(C16) : ARCHITECTURAL DRAWING AND GRAPHICS – III

Periods / Week : **04**
Periods / Semester : **72**
Credits : **04**
Internal Assignments & Mid's : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs (University Exam, Drawing & Theory)**

TIME SCHEDULE

S.No.	Major Topics	No. of periods	Weightage of marks	No of short ans. questions	No of essay ans. questions
1.	Unit – I Sciography	25	19	1	1
2.	Unit – II Rendering techniques	30	34	1	2
3.	Unit – III Architectural Presentation Techniques	20	27	3	1
	Total:	**72**	**80**	**5**	**4**

Note:

1) Duration of examination is for 3 hours.
2) 2. Part A: All 5 questions have to be answered No choice each question carries 4 marks.
3) Part B: 2 questions have to be answered out of 4 questions 2 are choice.
4) each question carries 15 marks.

COURSE OVERVIEW:

The course is intended to develop the techniques of Architectural rendering, Graphic skills required for effective presentation techniques.

COURSE LEARNING OBJECTIVES:

- The course is intended to develop the techniques of Architectural rendering, Graphic skills
- required for effective presentation techniques.
- To impart the skills of composition, rendering and presentation
- To focus on the Principles that regulate how well a composition of lines and shapes conveys the Illusion

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Analysis the techniques and types of shadows with angles.
CO 2	Knowing the types and techniques of renders in it.
CO 3	Getting to know about the logo design and digital presentation skills

COURSE CONTENTS:

Unit I:

Sciography : (i). Introduction to Sciography in the study of shade and shadows (ii). Study on points, lines,

surfaces, Simple and composite forms, shadows on horizontal, vertical planes and on their own surfaces. (iii). Study of shade and shadows of simple geometrical solids of various forms and groups of forms.

(iv) Shade and shadow techniques leading to advanced practical examples: shades and shadows on buildings or parts of buildings. Relative changes in building shades and shadows with sun angle, time, building height. (v) Introduction to sciography in perspective

Simple exercises on Sciography

Unit II:

Rendering techniques:

(i). Introduction to surfaces and media, observation, recording and basic representation techniques in different media through drawing pencil, pen, brush, charcoal, crayons & any relevant applications tools. (ii). Introduction of rules of composition and perspective in Architectural rendering, color study, values, tones and general approach to rendering.

(iii). Architectural Entourage - The Architectural Entourage is a collection of digital-born images of people and objects for use them to provide scale, depth, human interest and mood in finished architectural renderings and designs. (iv) Rendering with various colour mediums using water colours, poster colours, pencil rendering, monochrome and wash rendering. (v). Treatment of sky, clouds, landscape elements, human figures, foreground and surroundings, shadow projections in renderings.

Unit - III:

Architectural Presentation Techniques:

(i). Introduction to architectural presentations techniques, (ii). Basic techniques, Characteristics and Working with simple exercises for creating tonal values such as Hatching, Cross Hatching, Scribbling and Stippling (iii). Digital tonal values – Textures, Modeling & Lighting (iv). Tonal values in Architectural Drawings, Print media and digital layouts. (v) Page layout and Composition grids; Basic principles of Composition, Illustration techniques, Logo Designs; Portfolio design and formats;

METHODOLOGY:

- ★ There will be lectures on the given topics followed by practical exercises.
- ★ Sketching skills will be enhanced through manual replication of reputed architects projects and incorporation of elements such as human figures, landscapes, transportation, shade and
- ★ sciography etc.
- ★ Visual perception will be improvised through still life and memory based retention sketching
- ★ projects
- ★ Lectures and studio based exercises will be conducted to improve manual presentation and
- ★ rendering skills in various mediums.

REFERENCE BOOKS:

1) Thoms, E. French. Graphic Science and Design, New York: MC Graw Hill.
2) Francis D.K. Ching; Architectural Graphics.
3) Rendering with Pen and Ink, Robert W. Gill.
4) Rendering in Pen and Ink: The Classic Book On Pen and Ink Techniques for Artists.
5) Illustrators, Architects, and Designers (Practical Art Books) by Arthur L. Guptill (Author).

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes : AR 211 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	2	1	1	2	1	-	1	3	2	1	1	-	-
CO2	1	3	1	3	1	2	1	1	-	1	-	2		1	1	-	-
CO3	3	2	2	3	1	2	1	1	1	1	1	3	1	2	3	-	2
CO4	3	2	2	3	2	1	1	1	1	1	1	3	1	1	2	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	2	-	1	1	-	1
CO6	1	2	2	2	1	-	1					1		-	-	-	-
Total	13	15	11	16	08	08	06	07	03	03	03	14	04	06	08	-	6

AR212(C16) : BUDDHIST AND HINDU ARCHITECTURE

Periods / Week : 3
Periods / Semester : 54
Credits : 3
Internal Assignments & Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I Ancient India	4	10	1	1
2.	Unit – II Buddhist Architecture	8	12	2	1
3.	Unit – III Evolution of Hindu temple Architecture	8	10	1	1
4.	Unit – IV Temple Architecture- Southern India	12	18	1	2
5.	Unit – V Temple Architecture – Northern India	12	16	-	2
6.	Unit – VI Temple Architecture – Later chalukyan period	8	8	-	1
Total:		**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above
2) Final exam question paper consists as follows:

   (i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

Indian Architecture to be studied as development of building forms in response to social, religious, aesthetic and environmental factors. The study should focus on the three dimensional forms, plan forms, façade organization, structural solution, construction methods and ornamentation. The study should focus on the general trends and not on specific examples of buildings.

COURSE LEARNING OBJECTIVES

- To study Indian Architecture as development of building forms in response to social, religious, aesthetic and environmental factors.
- To focus on the three-dimensional forms, plan forms, façade organization, structural solution, construction methods and ornamentation.
- To understand Indian architecture as evolving within specific cultural contexts including aspects of society, religion, politics and climate.
- To gain knowledge of the development of architectural form with reference to technology, style and character in the Indus valley Civilization, Vedic period and manifestation of Buddhist and Hindu architecture in various parts of the country.
- Acquire knowledge to identify the common characteristics among the monuments of a particular style.
- Acquire graphic skills to present a building, analyze its elements and explain the composition.
- Acquire knowledge on good practices of architecture in the past.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Study of pattern and settlements from history, theories from past examples and understanding the architectural design concepts from the same.
CO 2	Evolution of Buddhist architecture and the study and analysis of fundamentals of design concepts from historical buildings.
CO 3	Analysis and evolution of temple form, learning about its meaning, symbolism ritual and social importance of temple, and its definition in terms of architectural design, understanding the categories of temple, and deep learning of elements of temple architecture.
CO 4	Analysis and evaluation from past settlements in history through different examples from diverse regions of India, exploring examples from south India and detailed understanding and labelling of elements of temple complex.
CO 5	Understanding the techniques of construction and design strategies in previous examples in north Indian temple architecture, and detailed understanding and labelling of elements of temple complex.

CO6	Evolution of later chalukyan architecture, Techniques in planning of temple complexes and architectural elements ,analysis from the learned study

COURSE CONTENTS:

Unit – I

Ancient India - Indus Valley Civilization: culture and pattern of settlement, Building materials and construction techniques -- Mohenjo-Daro, Harappa – Aryan civilization: theories and origins- Vedic culture - Vedic village and the rudimentary forms of bamboo and wooden construction – origins of Buddhism and Jainism

Unit – II

Buddhist Architecture - Evolution of Buddhism, Buddhist thought, art and culture - Hinayana and Mahayana Buddhism - evolution of building typologies- the stupa, vihara and the chaitya hall - symbolism of the stupa - architectural production during Ashoka's rule- Ashokan Pillar, Sarnath - rock cut caves at Barabar - Sanchi Stupa- rock cut architecture in Ajanta and Ellora - Karli - viharas at Nasik - Rani gumpha, Udaigiri - Takti Bahai, Gandhara.

Unit – III

Evolution of Hindu temple Architecture - Hindu forms of worship — evolution of temple form - meaning, symbolism, ritual and social importance of temple - categories of temple - elements of temple architecture - early shrines of the Gupta and Early Chalukyan periods

Tigawa temple - Ladh Khan and Durga temple, Aihole - Papanatha, Virupaksha temples, Pattadakal - Kailasanatha temple, Ellora.

Unit – IV

Temple Architecture- Southern India

Brief history of South India - Dravidian Order: evolution and form of gopuram - Rock cut productions under Pallavas: Shore temple, Mahabalipuram and Kailasanatha temple,

Kanchipuram, Chola Architecture: Nartamalai, Brihadeeswara, Gangaikonda Cholapuram and Darasuram temples -- temple gateways of Madurai and Chidambaram, temple towns: Madurai, Srirangam and Kanchipuram, Hoysala architecture: Belur and Halebidu.

Unit – V

Temple Architecture – Northern India

Temple architecture of Gujarat, Orissa, Madhyapradesh and Rajasthan - their salient features

Lingaraja Temple, Bhubaneswar - Sun temple, Konark. - Samantha temple, Gujarat, Surya kund, Modhera Khajuraho, Madhyapradesh - Dilwara temple, Mt. Abu.

Unit – VI

Temple Architecture – Later chalukyan period

Evolution of later chalukyan architecture, Techniques in planning of temple complexes and architectural elements - Mahadeva Temple at Itagi, Kasivisvesvara Temple at Lakkundi, Dodda Basappa Temple at Dambal

COURSREFERENCE BOOKS:

1) **George Michell**, "The Hindu Temple", BI Pub., Bombay, 1977.
2) **Stella Kramrisch**, "The Hindu Temple", Motilal Banarsidass, 1976.
3) **Parameswaranpillai V.R**., "Temple culture of south India", Inter India Publications.
4) **George Michell Ed,** "Temple Towns of Tamil Nadu", Marg Pubs, 1995.
5) **Percy Brown**. Indian Architecture: Buddhist and Hindu Periods. D.B. Taraporevala Sons and Co., Mumbai, 2003.
6) **Grover, Satish**. The Architecture of India. Vikas Pub. House Pvt. Ltd., Ghaziabad, 1980.
7) **Acharya, Prasanna Kumar** *(1946)*. An encyclopaedia of Hindu architecture.
8) **Hardy, Adam (2007**). The Temple Architecture of India,
9) Indian architecture by Rama Gouda.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR212(C160	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	3	3	3	2	2	2	1	1	1	1	-	2	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	1	-	1	2	-	-	1	-	3
CO4	3	2	2	2	2	1	1	3	1	-	1	1	-	1	-	-	3
CO5	3	3	2	2	1	2	1	2	-	-	-	3	-	1	-	1	3
CO6	3	2	2	3	1	1	3	1	1	-	-	1	1	-	-	1	-
Total	17	16	14	12	10	08	09	10	04	03	02	12	02	03	02	03	15

AR213(C16) : STRUCTURAL ANALYSIS

Periods / Week :4
Periods / Semester :72
Credits :4
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I Continuous beams:	9	10	1	1
2.	Unit – II Moment Distribution Method:	12	18	1	2
3.	Unit–III Kani's method / Rotation Contribution Method:	10	8		1
4.	Unit–IV Analysis Of Trusses :	10	8	-	1
5.	Unit–V Arches:	11	12	2	1
6	Unit–V Wind pressure on chimneys	10	10	1	1
7	Unit–VII Live study report	10	8		1
	Total:	**72**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURS LEARNING OBJECTIVES:

- Understand the concept of claperyon's theorem
- Understand the concept of moment distribution method.
- Understand the concept of kani's method.
- Understand the concept of method of joints and method of sections to analyze the 2D frames
- Understand and how to calculate internal forces, wind pressures, stability checks in chimney's, arches and retaining walls.

COURSEOUTCOMES: At the end of the course, the student will be able to

CO1	Analyze of indeterminate structures using claperyon's theorem
CO2	Analyze the statically indeterminate structures by using moment distribution method.
CO3	Analyze the statically indeterminate structures by using kani's method
CO4	Analyse the arches , chimney's and retaining walls
CO5	Explain about tall structures.

Unit – I

Continuous beams: Shear Force and Bending Moment diagrams for continuous beams using theorem of three moments (excluding derivation and sinking of supports).

Unit – II

Moment Distribution Method: Introduction, carryover, relative stiffness, application of Moment Distribution Method to Continuous beams, single bay frame without sway

Unit – III

Kani's method / Rotation Contribution Method: Introduction, rotational factors, application of Kani's method for beams and frames (single baywith out sinking of supports).

Unit – IV

Analysis Of Trusses :

ANALYSIS Of Frames 2-D Frames by method of joints & sections (Analytic method only)

Unit-V

Arches: Determination of horizontal thrust, bending moment and radial shear for three-hinged parabolic and segmental arches with supports at same level and different levels.

Unit-VI

wind pressure on chimneys ,Maximum & Minimum intensities of stress at bottom of chimneys Retaining walls subjected to earth pressure.

Unit – VII

Live study report on construction of tall structures.

COURSREFERENCE BOOKS:

1) **A.K.Jain and Punmia.** Strength of Materials.
2) **Ramamrutham, S.** Theory of Structures, 17th ed. Danpat Rai Pub. Co. Ltd., New Delhi, 2005.
3) **Reddy, C.S.** Basic Structural Analysis, 18th ed. Tata McGraw Hill Pub.Co.Ltd., New Delhi, 1991.
4) **OP Jain** – RCC Structures.

COURSE OUTCOMES VS PO_S AND PSO_SMAPPING:

Courses Out Comes AR213(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	1										1	3	1	1
CO2	3	3	2	1										1	3	1	1
CO3	2	3	3	1										1	3	1	1
CO4	2	3	3	1										1	3	1	1
CO5	3	3	2	1										1	3	1	1
Total	13	15	12	05										5	15	5	5

AR214(C16) : BUILDING CONSTRUCTION-III

Periods / Week : **04**
Periods / Semester : **72**
Credits : **04**
Internal Assignments & Mid : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **4 Hrs (University Exam, Drawing & Theory)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I **Understanding the structural components**	10	12	1	1
2.	Unit –II **Introduction to RCC**	10	12	1	1
3.	Unit–III **Substructure**	16	10		1
4.	Unit–IV **Superstructure**	16	12	1	1
5.	Unit–V **Miscellaneous**	10	12	1	1
6.	Unit–VI **Advanced concepts**	10	12	1	1
	TOTAL:	**72**	**70**	**5**	**6**

Note:

1) Duration of examination is for 4 hours without any break and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 6 essay questions out of which 4 to answer (2 are choice) and each carries 10 marks.

COURSE OVERVIEW:

The course focuses on understanding the potentials as well as shortcomings of RCC as a building material.

COURSE LEARNING OBJECTIVES:

- To introduce and expose to various ways in which RCC as a material is used in building construction.
- To understand about sub structure and design of various types of foundations.
- To understand about the superstructure and designing its elements.
- To understand about miscellaneous construction such as stair case and advanced construction of folded plate.
- To understand the concept of advanced concepts such as retaining wall, coffered slabs flat slabs and water tanks.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understand and analyze various basic building elements of a structure according to human need, technical terms and drawings according to norms of a building and to know the load distribution of a structure.
CO 2	Understand and analyze the RCC as material and its usage in constructing a structure and their methods
CO 3	Ability to analyze and design various elements of the building with Reinforced Concrete mainly Sub Structure and to understand and draw the technical drawings of various foundation through plans and sections
CO 4	. Ability to analyze and design various elements of the Reinforced Concrete Super Structure and to design the building technical drawings of super structure through plans and sections
CO 5	Design and detailing of technical drawings of miscellaneous and investigate advanced construction of folded plates in stair case.
CO 6	To understand and develop the concept of advanced concepts such as retaining wall, coffered slabs flat slabs and water tanks sketches

COURSE CONTENTS:

Unit I

Understanding the structural components of a typical RCC frame structure with reference to their location, junctions, load transfer and design aspects.

Unit II

Introduction to RCC: Understanding the properties and characteristics of RCC. Its advantages and disadvantages.Cast-in-situ and pre-cast constructional methods in RCC. Combined assignment for Unit I and Unit II

Unit - III

Substructure: RCC foundations – isolated footing wall and column , combined rectangular and trapezoidal footing, strap footing, pile foundation, and raft foundation.

Drawings to be prepared using proportionate scale: from Unit- III sheets: Isolated footing for wall and column, combined rectangle and trapezoidal footing, strap footing, under-reamed pile foundation single under-reamed pile and double under-reamed pile, different types of raft foundation flat plate type, flat plate with pedestals, two way beam ad slab type, cellular construction, basement wall with grid frame.

Unit – IV

Superstructure: RCC columns – different shapes, different combinations and loading conditions (axial, bending, non axial), slenderness factor.RCC beams - Single and doubly reinforced beams, T and L beams, continuous beams, lintels and brackets.

Drawings to be prepared using proportionate scale: From Unit-IV

Plan and section RCC slabs – One way and two way slabs.

RCC columns: Square, Rectangle, Round, Octagonal,

Plan and SectionRCC Beams :Simply supported, Contentious over supports, Cantilever, Singleand doubly reinforced beams, T beams, L beams,

Combined assignment for Unit III and Unit IV

Unit – V

Miscellaneous: RCC staircases and ramp – Waist slab and folded plate staircases.RCC Balconies, chajjas etc.

RCC staircase plan and section, Ramp, Folded plate stairs, RCC chajja and Canopy

Unit VI

Advanced concepts: Flat slab, coffered slab, diaphragms, retaining walland water tanks.

Combined assignment from Unit V and VI

Consolidated Assignment for RCC : RCC design for residence details including foundation, columns, balcony or verandah, lintel, slab, beams, stair case, concrete wall, retaining wall.

Note: This is a studio subject students should be made to prepare construction drawings as studio exercises along with theoretical inputs. The studio work should be supplemented

with appropriate side visits.

COURSREFERENCE BOOKS:

1) **Bindra and Arora.** Building Construction: Planning Techniques and Methods of Construction,19th ed. Dhanpat Rai Pub., New Delhi, 2000.
2) **Foster, J. Stroud.** Mitchell Building Construction: Elementary and Advanced, 17th ed. B.T.Batsford Ltd, London, 1963.
3) **McKay, W.B.** Building Construction Metric Vol. 1 – IV, 4th ed. Orient Longman, Mumbai,2005.
4) **Sushil Kumar.** T.B. of Building Construction, 19th ed. Standard Pub. Distributors, Delhi, 2003.
5) **Barry –** Building Construction.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes :AR 214 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	2	1	1	2	1	-	1	3	2	1	1	-	-
CO2	1	3	1	3	1	2	1	1	-	1	-	2		1	1	-	-
CO3	3	2	2	3	1	2	1	1	1	1	1	3	1	2	3	-	2
CO4	3	2	2	3	2	1	1	1	1	1	1	3	1	1	2	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	2	-	1	1	-	1
CO6	1	2	2	2	1	-	1					1		-	-	-	-

AR 215(C16) : SITE PLANNING & LANDSCAPE DESIGN

Periods / Week : **3**
Periods / Semester : **54**
Credits : **3**
Internal Assignments & Mids : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs (University Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I (Introduction To Site Analysis)	9	16	_____	2
2.	Unit – II (Site Influencing Factors)	9	10	1	1
3.	Unit – III (Design Of Landforms In A Site)	9	10	1	1
4.	Unit – IV (Site Planning Principles And Techniques)	9	10	1	1
5.	Unit – V (Gardens, Urban & Rural Landscape)	9	18	1	2
6.	Unit – VI (Contemporary Concerns)	9	10	1	1
	Total:	**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

This course introduces students to landscape design and site planning and relate it to design and planning of built environments. It provides an overview of development of landscape design, site studies, plant studies and application of the knowledge at various levels of design.

COURSE LEARNING OBJECTIVES:

- To develop a conceptual understanding of landscape design and site planning principles.
- To develop skills in integrating landscape design with built environments.
- To learn to map the site conditions with a building while designing.
- To gain knowledge on water systems and maintenance of plants on site.
- To understand the contemporary context and importance of design with landscape elements.

At the end of the course work, the students would be able to understand about the importance of site planning, and use it in their design work with the introduction of elements related to landscape,with proper indication of lines related to site planning and placement of trees in site, parallely learning how to plan a site on the basis of factors present on the site or to be brought out.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Students would be able to understand about the importance of site planning,
CO 2	Proper indication of lines related to site planning and indication of trees in site.
CO 3	how to plan a site on the basis principles of design and implement on the site or factors to be brought out.
CO 4	Suggest and analyze maintenance strategies for design of landscape.
CO 5	Elaborate the concepts of environmental design through analysis and review.
CO 6	Discuss about new technology and trends in landscape design.

UNIT-I

Introduction

Introduction and History of Landscape Architecture. Introduction to landscape Architecture and Role of Landscape design in built environment.

A brief review of Landscape Design and garden design in history in various regions Persian, Spanish, Italian, French, Moghul, English, Japanese Garden styles.

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.Elements of Landscape architecture and Design: 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 – II

Site Influencing Factors

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

Plants and Design.Design with plants – Basic principles of designs. The physical attribute of plants and relation to design. Appearance, functional and visual effects of plants in landscape design and built environment.Introduction to study of plants in relation to landscape design and architecture. An overview of use of plants in history.Study of Plant material – Botanical Nomenclature anatomy and physiology of plant growth study of trees, shrubs, ground cover, indoor plants in Indian context.

Field identification of minimum 20 common Indian trees and 25 common Indian shrubs

Unit – III

Design Of Landforms In A Site

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

Hard landscapes: design of paths, roadways streets, terraces etc and use of land form effectively.

Soft landscapes: design of lawns, shrubs, hedges, trees – in relation to buildings and other landscape elements.

Design concepts related to use of sculpture, outdoor lightings, Architectural feature, street furniture and grouping them into meaningful compositions for visual and functional effects

Unit – IV

Site Planning Principles And Techniques

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.

Irrigation systems – sprinkler trickle irrigation, drip irrigation and laying irrigation networks.

Construction of structure in landscape circulation roads, parking, paths, level changes – walls,

steps lamps, construction of screens, trellis, wall fences gales decks, pools etc.

Unit – V

Gardens, Urban & Rural Landscape

Urban Landscape, Significance of landscape in urban areas, introduction to street furniture, road landscaping, waterfront development, landscaping of residential areas, Industrial Landscaping. The role of landscape components in modifying micro climate with respect to temperature, humidity, precipitation and percolation on urban and rural level.

Unit – VI

Contemporary Concerns

20th century urban landscape, Roof gardens, Atriums, Road side plantation, avenues

Contemporary concepts and concerns

Contemporary attitude to development and design of open spaces – Urban landscape, Parks, Rural landscape etc.

Assignments:

Written assignments related to the units above or, answer to the related questions given on the topic.

Collection/field identification of minimum 20 common Indian trees and 25 common Indian shrubs

Studio exercise emphasizing relationship between built form and outdoor areas and site planning issues. / Preparation of a proper site plan/sheet presentation.

Design of a neighborhood park with all details related to landscape.

ASSIGNMENTS:

Written assignments related to the units above or, answer to the related questions given on the topic.

Collection/field identification of minimum 20 common Indian trees and 25 common Indian shrubs

Studio exercise emphasizing relationship between built form and outdoor areas and site planning issues./ preparation of a proper site plan/sheet presentation.

Design of a neighborhood park with all details related to landscape.

COURSREFERENCE BOOKS:

1) **Blake, Alan.** Landscape Construction and Detailing. B.T. Bats ford Ltd., London, 1996.
2) **Colvin, Brenda.** Land and Landscape.
3) **Hacheat, Brian.** Planting Design.
4) **Harris, C.W. and Dines, T. Nicholas.** T.S.S for Landscape Architecture. McGraw Hill, New York, 1995.
5) **Laurie, Michael.** An Introduction to Landscape, 2nd ed. Prentice Hall, New Jersey, 1986.
6) **Lynch, Kevin.** Site Planning. MIT Press, Massachusetts, 1962.
7) John l.Mutloch. Introduction to Landscape Design, ,2nd ed.John Wiley & Sons,Inc,New york,2001

8) **Santapau. H.** Common Trees. National Book Trust, New Delhi, 1981.
9) **Trivedi, P. Pratibha.** Beautiful Shrubs. Indian Council of Agricultural Research, New Delhi, 1990.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR215(C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	3	-	2	2	1	1	1	1	-	3
CO2	2	3	3	2	2	-	1	2	-	-	-	2	1	-	-	-	3
CO3	2	3	2	2	2	1	1	2	-	-	1	2	1	-	1	-	3
CO4	2	2	2	2	2	1	1	1	-	-	1	1	1	1	-	-	3
CO5	2	3	2	2	1	2	1	1	-	-	-	3	1	1	-	1	3
CO6	1	1	1	1	1	1	-	-	-	-	-	3	1	-	-	-	-
Total	12	15	13	10	10	06	06	09	-	02	02	12	05	03	02	01	15

AR 216(C16) : SURVEYING THEORY

Periods / Week : **3**
Periods / Semester : **54**
Credits : **3**
Internal Assignments & Mid's : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs. (University Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans. Questions	Essay Ans. Questions
			End Exam	End Exam	End Exam
1.	Unit – I Basic Principles of Surveying	6	10	1	1
2.	Unit – II Chain Surveying	10	10	1	1
3.	Unit–III Compass Surveying:	10	16	_	2
4.	Unit–IV Leveling	10	18	1	2
5.	Unit–V Automated Surveying	8	10	1	1
6.	Unit–VI Live study report	10	10	1	1
	Total:	**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVER VIEW

To explain the different techniques in survey of land tracts

COURSE LEARNING OBJECTIVES

- To explain the different techniques in survey of land tracts
- To explain the techniques and analysis used in survey of land tracts.
- Surveying skills and related theory. plotting the area with advanced instruments.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To demonstrate the Basic Principles of Surveying Linear Measurement
CO 2	To understand the Instruments for chaining and taping errors and corrections Plot an area with required offsets
CO 3	To evaluate different types of Bearings-Designation of bearings in Compass Surveying
CO 4	To understand and comply with Leveling of area
CO 5	To design and prepare drawings and specifications for Automated Surveying
CO 6	To understand the Plot, site, land and regions, size and shape of site,

COURSE CONTENTS:

Unit – I

Introduction – Definitions – Basic Principles of Surveying; Classification of Survey; Uses of Survey - Scales and Symbols-Sources of errors in Survey – Linear Measurement: accurate and approximate methods, duties of Surveyor. Plotting the linear measurements

Unit – II

Chain Surveying – Introduction – Types of chains and tapes. Instruments for chaining and taping – ranging-cross staffs – offsets – obstacles in chain surveying – errors and corrections (standardization, temperature and pull) composition of Areas (Trapezoidal rule – Average Ordinate-Simpson rule). Plot an area with required offsets

Unit – III

Compass Surveying: Introduction – Prismatic Compass and Surveyors Compass – Types of Bearings-Designation of bearings – Fore bearing and back bearing – Types of Traverse – Temporary adjustments of prismatic compass, local attraction, Corrections, precautions, errors.

Unit – IV

Leveling – Introduction –Definitions of terms used in leveling – Principle of leveling – Classifications temporary adjustments of dumpy level, RL's by height of Instrument and rise and fall method, Contouring and their characteristics, uses, – errors in leveling.

Unit – V

Automated Surveying – Introduction to use of Digital Surveying – Instruments such as distomat – total station, E.D.M & G.P.S. Plot the contour lines with T.S

Unit – VI

Site Studies – Plot, site, land and regions, size and shape of site, Analysis of accessibility, Topography, surveying symbols and Visual aspects.

COURSREFERENCE BOOKS:

1) **Arora, K.R. Surveying Vol. I, 6th ed.** Standard Book House, Delhi, 2000.
2) **Lynch, Kevin.** Site Planning. MIT Press, Massachusetts, 1962.
3) **Punmia, B.C.** Surveying Vol. 1, 13th ed. Laxmi Publications Pvt. Ltd., New Delhi, 1996.
4) **Kanetkar** – Surveying –I & II volumes.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR216(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO2	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO3	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO4	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO5	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO6	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
Total	6	12	-	0	0	6	-	-	-	6	-	-	-	-	-	12	-

AR 217(C16) : SURVEYING PRACTICALS

Periods / Week	**:4**
Periods / Semester	**:72**
Credits	**:4**
Internal Assignments	**:50 Marks**
External Examinations	**:50 Marks**
Total Marks	**:100 Marks**
Duration of Exam	**:3 Hrs. (External Practical/Viva Voce)**

TIME SCHEDULE

S. No	Major Topics	No. of periods
1.	Exercise - I : Chain & Compass Survey	12
2.	Exercise – II: Simple Leveling	12
3.	Exercise – III: Compass surveying	16
4.	Exercise – IV: Theodolite	16
5.	Exercise – V: Total station	16
	Total:	**72**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given instructions below.

2) A minimum of Ten (10 No.) Experiments shall be done and recorded in the record book specified (in which the Exercises 4 & 5 are compulsory).

3) A minimum of Eight (08 No.) experiments shall be given for external examination on lot basis.

4) **External exam** will be conducted for a total of 50 marks the weightage is as follows: (i) 10 marks for record,

(ii) 15 marks for survey experiment at the time of External examination,

(iii) 15 marks for the Script at the time of External examination and

(iv) 10 marks for Viva-Voice

5) **Internal exam** will be conducted for a total of 50 marks the weightage is as follows:

(i) 15 marks for record,

(ii) 25 marks for surveying experiment at the time of internal examination,

(iii) 5 marks for attendance and

(iv) 5 marks for personal involvement in the experiment

COURSE OVERVIEW:

To explain the different instruments in survey of land tracts

COURSE LEARNING OBJECTIVES

- To explain the different instruments in survey of land tracts
- To explain the techniques and instruments used in survey of land tracts.
- Surveying skills, techniques of total station, mapping and plotting of contour lines/survey done

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To demonstrate the Basic Principles of Surveying Linear Measurement
CO 2	To understand the Instruments for chaining and taping errors and corrections Plot an area with required offsets
CO 3	To evaluate different types of Bearings-Designation of bearings in Compass Surveying
CO 4	To understand and comply with Leveling of area
CO 5	To calculate the Measurement of horizontal and vertical angles. By Theodolite
CO 6	To understand Advanced Surveying Techniques and Plotting.,

COURSE CONTENTS:

Exercise - I: Chain & Compass Survey

1. Chaining of a line using Chain/Tape/Tachometer and Recording of details along the chain line.
2. Measurement of area – Cross staff survey.
3. Determination of area by direct and indirect ranging

Exercise - II: Simple Leveling

4. Measurement of elevation difference between two points using any leveling Instrument
5. Elevation difference between two points by Reciprocal leveling method.

Exercise - III: Compass surveying

6. Calculation of area between the points by Whone Circle Bearing (WCB) & Reduced Bearing (RB)

7. Plot the aerial view of the given area

Exercise - IV: Theodolite

8. Measurement of horizontal and vertical angles.

9. Determination of distance between two accessible and inaccessible points.

Exercise - V: Advanced Surveying Techniques and Plotting.

10. Study of Instrument (total station) – Determination of Distances, Directions and Horizontal angles and Determination of Heights of objects.

11. Determination of Boundaries of a Field and computation of area.

12. Plot the contour maps by using total station.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR217 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO2	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO3	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO4	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO5	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
CO6	1	2	-	1	-	1	-	-	-	1	-	-	-	-	-	2	-
Total	6	12	-	0	0	6	-	-	-	6	-	-	-	-	-	12	-

AR 218(C16) : ARCHITECTURAL DESIGN - II

Periods / Week : 9
Periods / Semester : 162
Credits : 9
Internal Assignments & Mid's : 200 Marks
External Examinations : 200 Marks
Total Marks : 400 Marks
External Jury : Viva Voce

TIME SCHEDULE

S.No.	Major Activities	No. of periods			Weightage of marks	
		Major Problem-1	Major Problem-2	Total	Internal	External
Major Problems 2 No. s						
1.	Data Collection: Literature & Standards Study	04	04	08	30 (15 for each major problem)	---
2.	Desktop Study	04	04	08		
3.	Case Studies	13	13	26		
4.	Site Analysis and Area Statements	09	09	18	100 (50 for each major problem)	150
5.	Conceptual design proposals	09	09	18		
6.	Final Design Portfolio	36	36	72		
		Sub-total		150		
Minor Problem 1 No.						
7.	Time Problem (from one of the minor problems)			12	50	50
8.	Attendance				20	---
	Total:			**162**	**200**	**200**

Note: (a) For assessment: as per the table shown above

1) From all units together - At least two from major problems and one from minor design / time problem should be done by the students.

2) Overall internal submission should have two major designs and two minor designs.

3) The final submission shall necessarily include a model for at least one of the two main problems.

4) In the end exam which is viva voce, the students have to present the entire semester work.

COURSE OVERVIEW:

This course is intended to provide skills for designing a single use, small span and single storey buildings with the requirement provided in the course.

COURSE LEARNING OBJECTIVES:

- To develop an understanding of various principles involved in designing different building typologies.
- To develop skills in learning the conceptual analysis and design development to practically implement in buildings.
- To design, keeping in mind the standard norms followed for each type of building.
- To gain knowledge to prepare drawings required for the execution of the buildings.
- To understand the significance, design, and functioning of common spaces like corridors, lobbies, courtyards etc. that can be designed to foster interaction.

1. At the end of the course work, the students would be able to understand about the importance of designing with norms and trying to solve various design issues.

2. The students will develop knowledge of the preparation of drawings for various building typologies.

3. Learning and understanding the design response to various trends in architecture.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To develop the design according to the user requirements with implementing innovation and aesthetics.
CO 2	Analyze the different methods and procedures used in practical development of design to attain solutions to simple and complex design problems.
CO 3	Design, exercises that explore Architecture as responding to various aspects such as contextual, social, economic, cultural and Standards issues.
CO 4	Exploration of spaces for study and interaction - Studying the function, circulation , zoning and understanding the technical requirements.

CO 5	Design with response to climatic factors and conduct literature -case studies on the existing buildings for its design as response to the climate and other existing aspects of the site.
CO 6	Study of the physical, socio economic and cultural aspects of a selected place to Understand the settlement pattern and amenities that are existing or required.

COURSE CONTENTS:

Major Problems: (I) Educational Buildings -(i) Kindergarten school, (ii) Balwadi, (iii) Youth club, (iv) Primary school, (v) Gymkhana, (vi) Training centre for educated unemployed youth.

(II) Health Buildings – (i) Primary health center (ii) Doctor's clinic, (iii) 20 Bed Nursing home.

(III) Cultural (i) Community halls / Marriage Hall**.**

Minor Problems: (I) Eateries - (i) Coffee shop, (ii) Ice cream parlour, (iii) Highway restaurant, (iv) Small cafeteria

(II) Amenities - (i) Village post office, (ii) Bank extension counter, (iii) Police station, (iv) Architects office

Internal submission:

- Study of Literature & Standards, Desktop existing relevant examples and Case studies on existing live examples are essential for every major & minor problem. And a comparative analysis of all the said studies projecting inferences.
- Site analysis, design methodology & conceptual design development including area statements to be prepared.
- Drawings of each design to be manually drawn with the required parameters which includes Designs showing detailed plans, sections, elevations, perspectives along with a model for one of the major problems.
- Each design problem to be submitted in the format given.
- At least 2 major and 1 minor / time problems to be done - Each design should be made as a portfolio for major & minor problems along with a scaled model for one of the major problems.

COURSREFERENCE BOOKS:

1) Richard Weston, Plan sections & elevations of key buildingsof the 20th century, Lawrence king publishing, London,2004.
2) Time saver standards for building types, DeChiara and Callender, Mc Graw hill company
3) Neufert Architect's data, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd.
4) National Building Code – ISI
5) Time saver standards for landscape architecture– Charles W Harris – Mc Graw Hill

6) New Metric Handbook– Patricia Tutt and David Adler – The Architectural Press
7) Sketch Plan Build:World class architects show how it is done, Harper design, New york, 2005
8) Mark Morris, Architecture and the Miniature: Models, John Wiley & sons, USA,2000.
9) National Architectural graphic standards, Ramsey / Sleeper, The American Institute of Architect.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR218 (C16)	Program Outcomes Po's													Program-Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	1	1	1	1	1	1	-	1	2	1	1	1	-	-
CO2	1	1	3	1	-	3	1	1	1	-	1	1	1	1	3	1	1
CO3	-	2	-	1	3	-	2	2	1	-	1	-	-	3	-	-	2
CO4	2	1	-	1	1	1	1	-	-	-	1	1	-	1	2	-	1
CO5	1	1	-	3	1	-	-	1	-	-	1	1	-	1	-	1	1
CO6	-	1	-	1	3	-	3	1	-	-	1	1	1	2	-	-	2
Total	06	08	4	08	09	05	08	06	03	-	06	06	03	09	06	02	07

AR 221(C16) : CLIMATE RESPONSIVE ARCHITECTURE

Periods / Week : **3**
Periods / Semester : **54**
Credits : **3**
Internal Assignments & Mids : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs (University Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	UNIT 1 Climate &Thermal Comfort	12	18	1	2
2.	Unit – II Solar Geometry &Design Of Sunshading Devices	10	18	1	2
3.	Unit–III Principles Of Thermal Design In Buildings	10	10	1	1
4.	Unit–IV Ventilation & Day Lighting	12	18	1	1
5.	Unit–V Design For Climatic Types	10	10	1	1
	Total:	**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE LEARNING OBJECTIVES:

- To impart sound knowledge of strength, behavior of various materials and techniques in the analysis of structures.
- Expected skills/knowledge transferred: ability to analyze the standard members in structures.
- This subject area is 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
- climate as the basic parameter of design.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Climate is a key factor in sustainable design and its variation has great influence on the effectiveness of housing in terms of social activity,human comfort.
CO 2	Intensity can be vary from moment to moment depending on its geographic location [latitude and longitude of the place]
CO 3	The main factor that influence thermal comfort are those that determine heat gain and loss namely insulation materials, air temperature, air speed, relative humidity.
CO 4	Learning about proper ventilation and lighting techniques and types in it.
CO 5	Types of climates and designing techniques in the different cimates.

COURSE CONTENTS:

Unit I

CLIMATE & THERMAL COMFORT : 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 II

SOLAR GEOMETRY &DESIGN OF SUNSHADING DEVICES :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 III

PRINCIPLES OF THERMAL DESIGN IN BUILDINGS : 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 gainunder 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 IV

VENTILATION & DAY LIGHTING : Functions of ventilation – stack effect due to the thermal forces, wind velocity – wind rosediagram, wind pressure - Air movement through building & around buildings – factors affectingindoor 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 – V

DESIGN FOR CLIMATIC TYPES: 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.

COURSREFERENCE BOOKS:

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

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR 221 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	2	1	1	2	1	-	1	3	2	1	1	-	-
CO2	1	3	1	3	1	2	1	1	-	1	-	2		1	1	-	-
CO3	3	2	2	3	1	2	1	1	1	1	1	3	1	2	3	-	2
CO4	3	2	2	3	2	1	1	1	1	1	1	3	1	1	2	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	2	-	1	1	-	1
CO6	1	2	2	2	1	-	1					1		-	-	-	-
Total	13	15	11	16	08	08	06	07	03	03	03	14	04	06	08	-	6

AR 222(C16) : ISLAMIC ARCHITECTURE

Periods / Week :3
Periods / Semester :54
Credits :3
Internal Assignments & Mids :50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I Introduction To Islamic Architecture	8	12	2	1
2.	Unit – II Islamic Architecture In India & Architecture Of The Delhi Sultanate	12	16	-	2
3.	Unit – III Islamic Architecture In The Provinces	14	18	1	2
4.	Unit – IV Mughal Architecture)	12	18	1	2
5.	Unit – V Cross-Cultural Influences	8	10	1	1
Total:		**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The study should focus on the three dimensional forms, plan forms, façade organization, structural solution, construction methods and ornamentation. The study should focus on the general trends and not on specific examples of buildings.

COURSE OBJECTIVES:

- 1.To understand Islamic architecture as evolving within specific cultural contexts including aspects of society, religion, politics and climate
- 2.To gain knowledge of the development of architectural form with reference to technology, style and character in the Indian context through the evolution of the mosque and tomb in the various phases of Islamic rule in the country.
- 3.To gain knowledge of the expertise of the Mughal rulers in city building and garden design.
- Acquire knowledge to identify the common characteristics among the monuments of a particular style.
- Acquire graphic skills to present a building, analyze its elements and explain the composition.
- To Acquire knowledge on good practices of architecture in the past.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Iintroduce a student in architectural characteristics of main movements from the formation period, through classical and post classical period in the end of 18th century.
CO 2	Developing existing building styles adding new elements to the history.
CO 3	Understanding the concept of space in buildings. The relationship between man and the space used by him, bringing out outcome-based solutions learning from reviews and diversified needs of different age and gender people in historical context.
CO 4	Explain how Islamic belief gave inputs in formation of Islamic art and architecture. able to identify major characteristics and forms of Islamic architecture.
CO 5	Understanding examples from history of architecture. The use of design principles in architecture, and their application and advantages in buildings.

COURSE CONTENTS:

UNIT-I

Introduction To Islamic Architecture

History of Islam: birth, spread and principles - Islamic architecture as rising from Islam as a socio-cultural and political phenomenon- evolution of building types in terms of forms and functions: mosque, tomb, minaret, madarasa, palace, caravanserai, market - character of Islamic architecture: principles, structure, materials and methods of construction, elements of decoration, colour, geometry, light

UNIT-II

Islamic Architecture In India & Architecture Of The Delhi Sultanate

Advent of Islam into the Indian subcontinent and its impact including the change in the architectural scene- overview of development based on political history and the corresponding classification of architecture - Islamic architecture in India: sources and influences

Establishment of the Delhi Sultanate- evolution of architecture under the Slave, Khalji, Tughlaq, Sayyid and Lodhi Dynasties — tombs in Punjab- important examples for each period

UNIT-III

Islamic Architecture In The Provinces

Shift of power to the provinces and evolution of regional architecture with their own unique influences: geographic, cultural, political, etc., - Bengal, Gujarat, Jainpur, Malwa, Kashmir, Deccan (Gulbarga, Bidar, Golconda and Bijapur) - important examples for each region

UNIT-IV

Mughal Architecture

Mughals in India- political and cultural history- synthesis of Hindu -Muslim culture, Sufi movement -

evolution of architecture and ouline of Mughal cities and gardens under the Mughal rulers: Babur, Humayun, Akbar, Jahangir, Shahjahan, Aurangazeb- important examples- decline of the Mughal empire.

UNIT-V

Cross-Cultural Influences

Cross cultural influences across India and secular architecture of the princely states: Oudh, Rajput, Sikh, Vijayanagara, Mysore, Madurai- important examples

COURSREFERENCE BOOKS:

1) **George Mitchell**, "Architecture of the Islamic World - Its History and Social meaning",Thames and Hudson, London 1978.

2) **Robert Hillenbrand,** "Islamic Architecture- Form, Function and Meaning", Edinburgh University Press 1994.
3) **Percy Brown**, "Indian Architecture (Islamic Period)", Taraporevala and Sons, Bombay, 1983.
4) **Satish Grover**, "Islamic Architecture in India", CBS Pub, New Delhi, 2002.
5) 5.**R.Nath**, "History of Mughal Architecture", Vols I to III - Abhinav Publications, New Delhi,1985.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR222(C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	1	3	3	2	2	-	1	1	-	1	-	2	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	1	-	1	2	-	-	1	-	3
CO4	2	2	2	2	2	1	1	3	-	-	1	1	-	1	-	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	3	-	1	-	1	3
TOTAL	08	14	12	09	09	05	06	09	01	03	02	11	01	03	2	1	15

AR 223(C16) : DESIGN OF STRUCTURES - RCC-I

Periods / Week :4
Periods / Semester :72
Credits :4
Internal Assignments & Mid Exams :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Exam)

TIME SCHEDULE

S.No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I Design of Beam Flexure(Working Stress Method)	10	10	1	1
2.	Unit–II Moment Design For Flexure (Limit State Method)	10	8	-	1
3.	Unit–III Design Of Doubly Reinforced Beams	10	18	1	2
4.	Unit–IV Design Of Beam For Shear, Bond And Torsion (Limit State Method)	10	8	-	1
5.	Unit–V Design of T-Beam	15	10	1	1
6.	Unit–VI Design and Detailing of stair case, Lintel, Cantilever and Slab	10	10	1	1
7	Unit-VII Introduction, To Prestressed Concrete	10	10	1	1
	Total:	**72**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

This course focuses on structural design of different RCC elements

COURSE LEARNING OBJECTIVES:

- To learn and understand the Design of Beam Flexure.
- To learn the ways of design in different methods.
- To understand the design of different structural elements in stair case.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To identify the type of beam and design by working stress method
CO 2	To understand the requirements of beam in limit state method and analysis of beam loading conditions
CO 3	To understand the Situations where doubly reinforced beams are used, analysis and design
CO 4	To analysis and design of T-beam using Limit State method
CO 5	Design of stair case and lintels
CO 6	To understand the prestressed concrete, Pretensiong & Post tensioning methods

COURSE CONTENTS:

Unit – I

Design of Beam Flexure (Working Stress Method **)**

Introduction to RCC design, Design Philosophies: Working stress singly reinforced beam, Analysis and Design using working stress. Reinforcement Detail Sketch of beam

Unit – II

Moment Design For Flexure (Limit State Method**)**

Introduction to RCC design, Design Philosophies: limit state method, singly reinforced beam, Analysis and Design using limit state methods. Reinforcement Detail Sketch of beam

Unit – III

Design Of Doubly Reinforced Beams

Situations where doubly reinforced beams are used, analysis and design of doubly reinforced beam using limit state method only. Reinforcement Detail Sketch of beam

Unit – IV

Design Of Beam For Shear, Bond And Torsion (Limit State Method**)**

Design of beam for shear, Bond- Development length, details sketch of shear reinforcement

Torsion- introduction , effects of torsion, IS CODE provisions.

Unit – V

Design Of T-Beam

T-beams: introduction, analysis and design of T-beam using Limit State method only. Design of shear reinforcement for all types of beams with and without cranking (Limit State method only)

Unit-VI

Design and Detailing of The Following

Design of stair case (Dog-legged only) using working stress method.

Design of lintels and cantilever beams and slabs using limit state method only

Unit-VII

Introduction, to prestressed concrete, Pretensiong & Post tensioning methods, Problems of beams

REFERENCE BOOKS:

1) **A.K.Jain.** Reinforced Concrete: Limit State Design, 5th ed. New Chand and Bros., Roorkee, 1999.
2) **Ramamrutham. S. and Narayan, R.** Design of RCC Structures, 12th ed. Dhanpat Rai Pub. Co. Pvt. Ltd., Delhi, 1998.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR 223 (C16)	Program Outcomes Pos												Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2	1	-	1	-	1	1	-	-	-	1	3	-	-
CO2	1	2	2	2	2	-	1	-	-	-	-	-	-	3	-	-
CO3	2	3	2	2	2	-	-	-	-	-	-	-	1	3	-	-
CO4	1	3	3	2	2	1	1	-	-	-	-	-	1	3	-	-
CO5	1	3	2	2	1	2	1	-	-	-	-	-	-	3	-	-
Co6	2	2	1	2	3	1	2	-	-	-	-	-	-	-	-	-
Total	07	16	11	09	07	04	03	01	01	-	01	-	03	15	-	-

AR 224(C16) : BUILDING CONSTRUCTION – IV

Periods / Week :04
Periods / Semester :72
Credits :04
Internal Assignments & Mid's :50 Marks
External Examination :50 Marks
Total Marks :100 Marks
Duration of Exam :4 Hrs (University Exam, Drawing & Theory)

TIME SCHEDULE

S.No.	Major Topics	No. of periods	Weightage of marks	No of short ans. questions	No of essay ans. questions
1.	Unit_I Structural Steel Work	12	10	1	1
2.	Unit-II Steel Work Connections.	12	5	1	-
3.	Unit-III Steel Members	12	10	1	1
4.	Unit-IV Steel Roof Trusses	12	10	1	2
5.	Unit-V	12	5	1	1
6.	Unit-VI	12	10	-	1
	Total:	**72**	**50**	**5**	**6**

Note:

1) Duration of examination is for 4 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 6 essay questions out of which 4 to answer (2 are choice) and each carries 10 marks.

COURSE OVERVIEW:

The course work deals with principles, methods and construction practices of structural steel work.

COURSE LEARNING OBJECTIVES:

- Introduction to Steel: Understand the properties and characteristics of steel as a building material, including its strength, durability, and versatility. Building Codes and Standards: Gain an understanding of the relevant building codes and standards related to steel construction, including the American Institute of Steel Construction (AISC) standards and codes
- Welding and Joining: Learn about various welding and joining techniques used in steel construction, including arc welding, gas welding, and bolted connections.
- Steel Structures: Learn the principles of designing, analyzing, and constructing steel structures, including beams, columns, trusses, and frames.
- To design, analyze, construct and maintain various types of steel roof trusses.
- Understanding of the principles, practices and technologies related to lantern and dome light and to design analyze, install and maintaining lighting systems that are safe, sustainable and efficient.
- To understand the properties and characteristics, types of Portal frame, geodesic principle, cable net and tensile structures

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understanding the properties and characteristics of steel as a building material including its strength, durability and versatility and able to analyze, design of various types steel sections through technical drawings.
CO 2	Knowledge of Welding and Joining techniques, understanding of the various joining techniques used in steel construction such as arc welding, gas welding, bolted connections and riveted connections
CO 3	Ability to analyze and design Columns and sanctions, column bases , beam and griders, column and beamconnections plate girders , lattice or warren girder usage in a building to present the technical drawings.
CO 4	To design, analyze and construct various types of steel roof trusses and their technical drawings
CO 5	Understanding of the principles, practices and technologies related to lantern and dome light and to design analyze, install and maintaining lighting systems that are safe, sustainable and efficient
CO 6	To understand and develop the technologies of various types of Portal frame, geodesic principle, cable net and tensile structures their usage in building construction

Unit I

Structural Steel Work;

General principles and terms defined, Standard sections i.e. beams joints , angles , channels,tees, bolts, rivets and welding**.**

Unit II

Steel work connections :

Bolt connections, riveting and welding methods.

Unit III

Steel Members :

Columns and sanctions , stanchions or column bases , beam and griders, column and beamconnections plate girders , lattice or warren girder.

Unit IV

Steel Roof Trusses

Steel trusses, types for various spans, tubular steel roofs, monitor roof, north light roof truss,detail of steel –roof trusses

Unit V

Lantern light, dome light, structural steel practice and drawings as per IS Code.

Unit VI

Portal frame, geodesic principle, cable net and tensile structures.

Note:-

This Is a studio subject and students should be made to prepare construction drawings as a studio exercise along with the theoretical input. The studio work should be supplemented with appropriate site visits also.

COURSREFERENCE BOOKS:

1) **Bindera and Arora.** Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub, New Delhi, 2000.
2) **WB Mckay j.**k. building construction metric vol. 4, 4th ed. Orient Longman pvt .ltd, mumbai, 2002.
3) **Mitchell**. Advanced structure.
4) **Rangwala, S**.C Engineering material: material science, 31st ed.Charotar pub. Houe, anand, 2004.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR 224(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	2	1	1	2	1	-	1	3	2	1	1	-	-
CO2	1	3	1	3	1	2	1	1	-	1	-	2		1	1	-	-
CO3	3	2	2	3	1	2	1	1	1	1	1	3	1	2	3	-	2
CO4	3	2	2	3	2	1	1	1	1	1	1	3	1	1	2	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	2	-	1	1	-	1
CO6	1	2	2	2	1	-	1					1		-	-	-	-
Total	13	15	11	16	08	08	06	07	03	03	03	14	04	06	08	-	6

AR 225(C16) : BUILDING SERVICES: WATER SUPPLY AND SANITATION

Periods / Week : **03**
Periods / Semester : **54**
Credits : **03**
Internal Assignments & Mid's : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs. (University Exam)**

TIME SCHEDULE

S.No.	Major Topics	No. of periods	Weightage of marks	No of short ans. questions	No of essay ans. questions
1.	Unit – I Water Supply Engineering	10	18	1	2
2.	Unit – II Plumbing	08	10	1	1
3.	Unit – III Sewage Treatment	10	18	1	2
4.	Unit – IV Environmental Sanitation	10	18	1	2
5.	Unit-V Roads And Pavements	04	10	1	1
	Total:	**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2**)** Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

Understanding the significance, design and functioning of water and sewerage systems as essential components in building design and site planning.

COURSE LEARNING OBJECTIVES:

- To develop a conceptual understanding of various principles and appurtenance of water supply and sanitation systems.
- To develop skills in learning the integration of efficient water supply and drainage systems in building design.
- To learn to prepare water supply and drainage plans for site and building levels.
- To gain knowledge to prepare an estimation of quantities required for sanitary and water supply systems for buildings.
- To understand the significance, design, and functioning of water and sewerage systems as essential components in building design and site planning.

1. At the end of the course work, the students would be able to understand the importance of water supply and sanitation systems and their use in design and construction
2. The students will develop knowledge of the preparation of drawings for building services.
3. Learning the practical implication of water supply and sanitation systems in the buildings.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understand the fundamentals of water supply and sanitation systems of Architectural design in buildings taking into consideration the environmental context and sustainability.
CO 2	Analyze the different methods and systems used in water supply and sanitation to attain solutions to simple and complex design problems.
CO 3	Design the plumbing layouts for buildings through clear knowledge of design and execution to maintain health and life safety.
CO 4	Develop creative competence in design through understanding the construction of sewage systems and road drainage systems.
CO 5	Elaborate on the efficient treatment systems in plumbing to obtain solutions to complex problems that satisfy the function and aesthetics of design.
CO 6	Discuss the usage of software design tools to prepare the plumbing layouts from concepts to building modeling.

UNIT I

Water Supply Engineering

Water sources-surface& groundwater sources, Quantity and quality of water-demand projection, per capita consumption of water, Nature of impurities, water treatment systems, tests - Water Distribution Methods of Distribution, Systems of Supply of Water, Layout of Distribution Pipes-Internal water supply in Buildings Types of Pipes, Laying of pipes - Above & Below Ground, Jointing, Testing-Prevention of Water Wastage - Preparing Water Supply Schemes, standards for water supply.

UNIT II

Plumbing

House Drainage, Domestic Sanitary Installations, traps, various Systems of House Plumbing, Rain water harvesting and systems, Drainage of Sub-soil water, Layout of Drainage system, connection to sewers, Standards for Sanitary Conveniences.

UNIT III

Sewage Treatment

Primary treatment-Screens, Grit Chambers, Plain Sedimentation tanks or Skimming Tanks &Settling Tanks or Clarifiers, Secondary treatment - Filtration - Contact Beds, Intermittent & Trickling Filters and Activated Sludge Process, Disinfection, Disposal of Sewage-Disposal of sewage from isolated buildings - Septic Tanks, Disposal of sewage in Villages - water recycling. Different Sewerage treatments.

UNIT IV

Environmental Sanitation

Environmental sanitation-the importance of sanitation classification of waste, disposal of refuse, composition, collection, conveyance of refuse disposal systems in towns &recovery of refuse Sewerage system - sewage - definitions and importance of quantity of sewage, storm water and design of sewers-systems of sewerage-dry and water carriage systems, patterns of collection, sewers - materials used, shapes of sewers, construction & maintenance of sewers, sewer joints, sewer appurtenances.

UNIT V

Roads And Pavements

Different types, water bound macadam tar bitumen, asphalt and c.c. Roads, soils stabilization, murram, brick and stone paving, drainage of roads, sub drains, culverts, ditches and gutters.

REFERENCE BOOKS

1) Fair G.M., Geyer J.C. and Okun D.A., Water and Waste Engineering, Volume 2, John Wiley and sons, Inc. New York, 1968.

2) Manual on water and treatment, 2nd Edition, CPHEEO, Ministry of works and Housing, New Delhi, 1980.
3) Rangwala S.C., water supply and sanitary Engineering, Anand Charotar publishing house, 1981.
4) Venugopala Rao P., Textbook of Environmental Engineering, Prentice Hall of India Pvt. Ltd., 2002.
5) Water Supply & Sanitary Engineering – Duggal.
6) Water Supply & Sanitary Engineering – G.S.Birdi.
7) Husian S.K., Textbook of Water Supply and Sanitary Engineering, Oxford & IBH, 2006.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR225(C16)	Program Outcomes Po's													Program-Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	1	-	-	3	-	-	-	3	-	3	-	-	-
CO2	1	-	2	-	-	2	-	-	-	-	-	2	-	-	2	-	-
CO3	1	1	-	-	-	1	3	-	-	-	1	2	-	3	1	-	-
CO4	-	-	-	1	-	1	1	-	-	-	-	3	-	1	1	-	-
CO5	3	1	3	-	-	1	1	-	-	-	-	2	-	1	1	-	1
CO6	1	-	1	-	-	3	-	-	-	-	-	2	1	2	-	-	-
Total	08	03	06	01	01	08	05	03	-	-	01	14	01	10	05	-	01

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AR 226(C16) : COMPUTER APPLICATIONS - II

Digital Lab Periods/Week :4
Digital Lab Periods/Semester :72
Credits :4
Internal Assignments & Mid's :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3Hrs (Lab & Viva)

TIME SCHEDULE

S. No	Major Topics	No. of periods
1	Introduction to AUTO CAD	2
2	Basic Drawing Tools	8
3	Editing Tools	8
4	Appearing Tools(hatching, Dimensions, Layers etc.,)	8
5	Blocks	4
6	Advanced Techniques	8
7	Plotting	2
	Working with data (Practice)	30
	MID Exam	2
	Total	72

COURSE OVERVIEW:

This is a beginning course in the study of Computer Aided Drafting (CAD) with regard to Architecture. Students learn the commands necessary to produce construction documents for a building using the AutoCAD Software.

COURSE LEARNING OBJECTIVES:

This course is an introduction to AutoCAD software and its use in the field of architecture.
Students will learn the basics of 2D drafting and design, as well as architectural drawing standards and conventions.

They will also explore the use of AutoCAD in the creation of architectural plans, sections, and elevations.

COURSE OUTCOMES: By the end of this course, students will be able to:

CO 1	Create, modify and annotate 2D drawings in AutoCAD.
CO 2	Understand and apply architectural drawing standards and conventions.
CO 3	Create and edit architectural plans, sections, and elevations.
CO 4	Understand and apply the principles of scale, dimensioning, and layout.
CO 5	Use Auto CAD to prepare basic architectural drawings for presentation and construction.

COURSECONTENTS:

Unit I

Introduction to AUTO CAD, Exploring the AutoCAD for Windows User Interface. Setting Drawing Units Basic Drawing Tools - Drawing Lines and Rectangles, Canceling, Erasing, and Undoing. Using Coordinate Systems. Drawing Circles, Arcs, and Polygons. Filleting and Chamfering Lines. Grid and Snap. Ortho and Polar Tracking. Object Snaps

Unit II

Editing Tools, Creating Selection Sets. Move and Copy, Rotate and Scale, and Working with Arrays. Trim and Extend, Lengthen and Stretch, Offset and Mirror options Creating Selection Sets. Move and Copy, Rotate and Scale etc.,

Unit III

Appearing Tools, Setting,, Controlling Layer Visibility. Applying Line type. Specifying Hatch Areas. Associating Hatches with Boundaries. Hatching with Patterns, Hatching with Gradients. Styling ,Adding & Editing Dimensions

Unit IV

Blocks - Working with Global Blocks. Defining, Inserting, Editing Blocks & Redefining Blocks. Advanced Techniques. Navigating & Modeling 3D Models.

Unit V

Plotting Layouts and Exporting to an Electronic Format

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR 226 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	1	2	1	2	0	0	0	0	0	0	1	-	-	3
CO2	1	3	3	2	2		1	0	0	0	0	0	0	-	-	-	3
CO3	2	3	2	2	2	1	1	0	0	0	1	0	0	-	-	-	3
CO4	2	2	2	2	2	1	1	0	0	0	1	0	0	1	-	-	3
CO5	2	3	2	2	1	2	1	0	0	0	0	0	0	1	-	-	3
Total	10	15	12	09	09	05	06	0	0	0	02	0	0	03	-	-	15

AR 227(C16) : ARCHITECTURAL DESIGN- III

Periods / Week : **09**
Periods / Semester : **162**
Credits : **09**
Internal Assignments & Mid's : **200 Marks**
External Examinations : **200 Marks**
Total Marks : **400 Marks**
Duration of Exam : **Viva - Voce**

TIME SCHEDULE

S.No.	Major Activities	No. of periods			Weightage of marks	
		Major Problem-1	Major Problem-2	Total	Internal	External
Major Problems 2 No. s						
1.	Data Collection: Literature & Standards Study	04	04	08	30 (15 for each major problem)	---
2.	Desktop Study	04	04	08		
3.	Case Studies	13	13	26		
4.	Site Analysis and Area Statements	09	09	18	100 (50 for each major problem)	150
5.	Conceptual design proposals	09	09	18		
6.	Final Design Portfolio	36	36	72		
		Sub-total		150		
Minor Problem 1 No.						
7.	Time Problem (from one of the minor problems)			12	50	50
8.	Attendance				20	---
	Total:			**162**	**200**	**200**

Note:

1) At least two major problems and one minor design/time problems should be done by students.
2) The final submission shall necessarily include a model for at least one of the two major problems.

3) In the end exam which is a viva-voce the students are to present the entire semester work for assessment.

COURSE OVERVIEW:

This course focuses on buildings for residential use.

COURSE LEARNING OBJECTIVES:

- To enhance the understanding of the complexities of architectural design for residential needs and develop creative design solutions for good living environments.
- Organization of functional activities in relation to user requirements and the site.
- Relating the system of horizontal and vertical circulation, open spaces, parking etc.
- Responding to socio-economic factors such as income levels, privacy, territoriality, interaction
- Considering materials, structure and services in relation to the design proposal.
- Integration of plan forms and three dimensional compositions.
- Detailing for the specially abled and the elderly persons.

At the end of the course the students will be able to achieve different skills for creative thinking, understanding the importance of human measure and design according to it for various spaces in architectural design learning examples from the same.

COURSE OUTCOMES:

CO 1	Understanding about the analysis of various functional spaces in architectural design, through proper literature study and case study proposals,presentation in systematic review format.
CO 2	Analyzing and investigating the need of proper space design with functional, aesthetic and behavioral norms relating it to the activity analysis of individual human needs through communication with people required for different activities and understanding their requirements at different levels and places.
CO 3	Formulation of the knowledge acquired from existing studies, comparative analysis from the research done in literature and application of the same to the outcome to acquire solutions to complex design problems.
CO 4	Learning to produce solutions to the design through review process and designing concepts which would include logical thinking, involving the various factors of culture and context which would work for the wellbeing of the occupants, through drawing techniques and architectural illustrations in design.

COURSE CONTENTS:

Major Problems: (i) Holiday resort, (ii) Block of flats and residential complexes at a small scale, (iii) Housing for specific communities in urban such as home for the aged and (iv) Housing for specific communities in Rural areas such as fishermen, weavers, artisans housing etc.

Minor Problems: (i) Large guest house, (ii) Students hostel, (iii) Small hotel, (iv) Motel, (v) Form house and (vi) Row housing in a small area comprising for 200 population (20 dwelling units),

Necessary theoretical inputs to be given highlighting the norms and design issues. The topics not covered as design problems will have to be covered by the Studio faculty members through lecture/slide show sessions and site visits.

INTERNAL SUBMISSION:

- Study of Literature & Standards, Desktop existing relevant examples and Case studies on existing live examples are essential for every major & minor problem. And a comparative analysis of all the said studies projecting inferences.
- Site analysis, design methodology & conceptual design development including area statements to be prepared.
- Drawings of each design to be manually drawn with the required parameters which includes Designs showing detailed plans, sections, elevations, perspectives along with a model for one of the major problems.
- Each design problem to be submitted in the format given.
- At least 2 major and 1 minor / time problems to be done - Each design should be made as a portfolio for major & minor problems along with a scaled model for one of the major problems.

COURSREFERENCE BOOKS:

1) **Chiara Joseph de and Others.** Time Savers Standards of Building Types. McGraw – Hill, 1990.
2) **Neufert, Ernst. Ernst Neufert Architects Data**, Granada Pub. Ltd., London, 2000.
3) **Peloquin, Albert.** Barrier-Free Residential Design. McGraw-Hill, Inc., New York, 1994.
4) **Pevsner, Nikolaus.** A History of Building Types. Thames and Hudson, London, 1976.
5) **Shah, S. Charanjit.** Architects Hand Book Ready Reckoner. Galogotia Pub., New Delhi, 1996.
6) **Untermann, Richard and Snall, Robert.** Site Planning for Cluster Housing.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR227 (C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	2	1	2	2	-	2	2	1	1	1	1	-	3
CO2	3	3	3	2	2	-	1	2	-	2	-	1	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	-	-	1	-	2	-	1	-	3
CO4	2	2	2	2	2	1	1	-	-	-	1	-	1	1	-	-	3
Total	10	11	10	9	8	3	5	5	-	4	4	2	4	2	2	-	12

AR 311(C16) : BUILDING ESTIMATION, SPECIFICATIONS AND COSTING

Periods / Week : **4**
Periods / Semester : **72**
Credits : **4**
Internal Assignments & Mids : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs (University Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1	**Unit – I** Quantity Surveying	6	2	1	
2	**Unit – II** Detailed Building Estimation	8	10	1	1
3	**Unit - III** Detailed estimation for load bearing structures	12	16		2
4	**Unit – IV** Excavation to finishes.	12	8		1
5	**Unit – V** estimates for services	8	8		1
6	**Unit – VI** Rate analysis	8	10	1	1
7	**Unit – VII** Valuation	8	10	1	1
8	**Unit-VIII** Specifications:	10	10	1	1
Total:		**72**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists of 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course deals with various methods of quantity surveying, rate analysis of building and valuation and specifications for different materials used.

COURSE LEARNING OBJECTIVES:

- To deal with various methods of quantity surveying, rate analysis of building and valuation and specifications for different materials used.
- To develop estimation and costing skills and to enhance in the student ability in attending for estimation and costing jobs.
- Understanding the procedure and application also to know the market prices of various building materials to apply in their exercises of estimation and costing.
- To get the awareness of building material specifications & prices and its application in various types of construction techniques
- Techniques of estimating and costing and writing specification related to building construction.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understanding the basic terminology of Principles in estimation and costing following mathematical calculations for preparing approximate estimates which would be area based and relating it to different spaces in architectural design.
CO 2	Understanding the procedure to be adopted for making bill of quantities from formats of any one of the departments such as PWD / R&B working in urban level with different typology of buildings.
CO 3	Understanding how to do a detailed estimation to be done for a structure right from construction level costs to execution at design level.
CO 4	Exercises taken from field level in practical understanding of a complex design problem estimate to be made in detail, from construction details of structural systems, taking building envelope into consideration.

CO 5	Learning to prepare approximate estimates for services like Water supply Plumbing, Electrical work, Mechanical equipment, Air conditioning including equipment required for safety and security at construction level in design.
CO6	Understanding rate analysis in architectural practice, relating it to the selection of different materials used in construction, with understanding of practical limitations on site and economy in design.
CO7	Analysis of market value in architectural practice, relating it to the selection of different materials used in construction, with understanding of practical limitations on site and economy in design, issues and challenges that come across in diverse problems of design.
CO8	Understanding and learning the importance of specifications relating it to the needs of Detailing in construction materials used at different levels in functional and technical requirements pre and after installation of different products.

COURSE CONTENTS:

Unit I

Quantity Surveying: (i) Introduction (ii) Definitions and terms used (iii) Principles (iv) Units of measurements (v) Methods of preparing approximate estimates (a) Plinth area based and (b) Cubic content method (c) Basic differences and advantages between Plinth area and Cubic content methods.

Unit II

Detailed Building Estimation: (i) Methods of obtaining detailed quantities of building items (a) Center line method (b) Long wall and short wall methods (the procedure to be adopted from any one of the departments such as PWD / R&B)

Unit III

Detailed estimation: (i) Detailed estimation to be done for (a) load bearing structures and (b) RCC framed structures (for ground floor only)

Unit IV

Example and exercise in obtaining all items from excavation to finishes.

(A) Substructure – (a) Site clearance, (b) Excavation for Column foundations and Load bearing foundations, (c) Filling of excavated areas, (d) Laying of RCC foundations for columns and laying of columns, (e) Plinth beams, (f) Brick/Stone works, (g) DPC, (h) Filling and Consolidation of Plinth / Basement, (i) PCC beds) **(B) Super structure** –(a) Lintel level - Brick work, Doors, Windows and Ventilators, RCC Items such as lintel beams, sunshades, lofts (b) Above the Lintel and up to Roof Level – Brick work, RCC Columns, Beams, Roof slab, Plastering interior (Walls, Sills, Ceiling), Parapet walls, Water proofing treatment on terrace, staircase head room (brick work, roofing, door and window) Interior plastering. (c) Exterior plastering from bottom to top of all exterior items including exterior ceilings.

Unit V

Preparing approximate estimates for services: (i) Water supply (ii) Plumbing (iii) Electrical work (iv) Mechanical equipment (v) Air conditioning. (the approximate estimates to be done for a two bed residential building only of a single floor along with a staircase).

Unit VI

Rate analysis: (i) Cost of materials and labour for various works, (ii) data sheet for different items of works, (iii) different methods of execution i.e. (a) piece work, (b) daily basis, (c) lump sum, (d) labour rates and (f) percentage including labour and material etc

Unit VII

Valuation: (i) Introduction (a) state the purposes of valuation of building explain the (b) terms, (c) market value, (d) book value, (e) capital cost, (f) capitalized cost, (g) year's of purchase,(h) annuity (ii) list out various methods of estimating the depreciation of building properties,(a) calculate the value of the property by different methods.

Unit VIII

Specifications;(i) Definition, purpose and importance of specifications, General or brief specifications, Detailed specifications, (ii)Writing of specifications, for items like earthwork excavations, foundation, CRS masonry, DPC, PCC, RCC, brickwork, doors and windows (wooden), mortars, plaster, painting, flooring like terrazzo flooring and tiles, ceramic tiles, marble, granite, distemper, snow Sem, glazing, specification, writing to include materials, tests pre and post installation, modes of measurements.

COURSREFERENCE BOOKS:

1) **Datta, B.N.** Estimating and Costing in Civil Engineering: Theory and Practice, 23rd ed. UBS Pub. Distributors Ltd., New Delhi, 1993.
2) **Bride, G.S. Estimating and Costing,** 2nd ed. Dhanpat Rai and Sons, Delhi, 1982.
3) **Rangwala, S.C.** Valuation of real Properties, 6th ed. Charotar Pub. **6** House, Anand, 2003.
4) **Standard Specification and rates,** Government of Andhra Pradesh**,**Government Press, Hyderabad.
5) **Indian Standards Institution.** National Building Code of India. Indian Standards Institution, New Delhi.
6) **Lerrs, Jack.** Engineering Construction Specification.
7) **Macey, W. Frank.** Specification in Detail, 5th ed. Technical Press ltd, London, 1955.
8) **Lewis, R. Jack.** Building Construction Specifications. Prentice-Hall, Inc., New Jersey, 1975.
9) **Govt. of Maharashtra.** Standard Specifications, Government Press, Nagpur, 1972.
10) Estimating and Costing by Mahajan.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR311(C 16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	3	3	3	2	2	2	1	1	1	1	-	2	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	1	-	1	2	-	-	1	-	3
CO4	3	2	2	2	2	1	1	3	1	-	1	1	-	1	-	-	3
CO5	3	3	2	2	1	2	1	2	-	-	-	3	-	1	-	1	3
CO6	3	2	2	3	1	1	3	1	1	-	-	1	1	-	-	1	-
CO7	3	2	3	1	1	1	-	-	-	1	2	1	1	1	-	1	1
CO8	2	1	1	2	2	1	-	-	-	1	2	1	-	-	-	-	-
Total	22	16	14	12	10	08	09	10	04	03	02	12	02	03	02	03	16

AR 312(C16) : MODERN ARCHITECTURE

Periods / Week : 3
Periods / Semester : 54
Credits : 3
Internal Assignments & Midst : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I -Introduction	10	10	1	1
2.	Unit – II - Modernism	10	18	1	2
3.	Unit – III - Phenomenology And Post Modernism	12	18	1	2
4.	Unit – IV - Anti-Architecture and De-constructivism	12	18	1	2
5.	Unit – V - Neo-Modernism And Other Post Modern Reactions.	10	10	1	1
Total:		**54**	**74**	**5**	**8**

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The study should focus on the three dimensional forms, plan forms, façade organization, structural solution, construction methods and ornamentation. The study should focus on the general trends and not on specific examples of buildings.

COURSE LEARNING OBJECTIVES:

- To focus on the three-dimensional forms, art works, façade organization, structural solution, construction methods and ornamentation details followed in buildings of modern age.
- To Introduce the condition of modernity and bring out its impact in the realm of architecture
- To Study modern architecture as evolving from specific aspects of modernity-industrialization, urbanization, material development, modern art as well as society's reaction to them.
- To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.
- To Acquire knowledge to identify the common characteristics among the monuments of a particular style.
- To Acquire graphic skills to present a building, analyze its elements and explain the composition.
- To Acquire knowledge on good practices of architecture in the past.

At the end of the course work, the students would be able to understand about the importance of learning example of great art work from historical examples and and use the concept and typology their design work with the knowledge of evolution of building design according to context and requirement of the different era in accordance with material and new technology.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Study and analyze the theories examples from past buildings their functions and values, relation of their evolution according to context and diverse needs, challenges according to the situation and solutions arrived to design different structures from history.
CO 2	Understanding the evolution of different theories of structures arrived according to need and space availability ,response from socio cultural factors and learning from pioneers of architectural design ,their art works and strategies.
CO 3	Analyzing the aspects of design outcomes through different principles involved in bringing out a creative competence, understanding of the materials and construction techniques involved through the study of communication from different theories from architects and their aspects involved in design.
CO 4	Origin and influence of versatile architects and their application of theories, giving solutions to complex problems in design related to spatial aspects and various diversified demands and understanding the envelope of buildings in modern age with relation to the demand and availability at that time.
CO 5	Apply the knowledge of new techniques involved in design with the neo theories and works of different architects.

COURSE CONTENTS:

Unit I

Introduction: (i) Influence of Industrial Revolution on (a) building materials, (b) Construction Technology, (c) evolution of new building types and (d) increasing user requirements.

Unit II

Modernism - (i) Context of Origin; Characteristics; (ii) Key Movements –Art nouveau, (iii) Arts and Crafts, (iv) Chicago school of architecture, (v) Constructivism, (vi) Bauhaus, (vii) Expressionism, (viii) Minimalism and Brutalism. (ix) Works of notable conforming Architects: (a) Frank Lloyd Wright, (b) Ludwig Mies (c) Vander Rohe, (d) Le Corbusier, (e) Walter Gropius (f) Oscar Niemeyer and (g) Alvar Aalto.

UNIT III

Phenomenology And Post Modernism - (i) History of Origin; Aims and characteristics; (ii) Key themes – (a) Place, (b) Movement, (c) Regionalism, (d) Building materials in their sensory aspects, (iii) Dwelling; (a) Influence on Architectural practice-(b) Metaphoric architecture. (iv) Works of notable conforming Architects: (a) Charles Moore, (b) Peter Zumthor, (c) Philip Johnson and (d) Michael Graves.

UNIT IV

Anti-Architecture and Dconstructivism – (i) Origin and influences breaking away from (a) Modernism and (b) Postmodernism, (ii) Influences of (a) Analytical Cubism, (b) Constructivism and (c) futurism; (iii) De-constructivist philosophy – (a) Influence on Architectural practice, (iv) Works of notable conforming Architects: (a) Frank O Gehry, (b) Daniel Libeskind, (c) Rem Koolhaas, (d) Peter Eisenman and (e) Bernard Tschumi.

UNIT V

Neo-Modernism And Other Post Modern Reactions – (i) Origin and prevalence, Characteristics, Other associated movements: (ii) Metamodernism, Remodernism, Neo-futurism . Works of (a) Richard Meier, (b) I.M. Pei, (c) Tadao Ando, (d) ZahaHadid, and (e) Santiago Calatrava.

COURSREFERENCE BOOKS:

1) **Kenneth Frampton**, Modern Architecture: A Critical History, Thames and Hudson, London.
2) **Sigfried giedion**, .Space time and Architecture: The Growth of a New tradition, Harvard University Press.
3) **Tzonis Alexander, Santiago calatrova** , International Publications, January 2005, New York.
4) **Manfredo Tafuri**., "Modern Architecture", Harry N. Abrams Inc, 1980.
5) **Curtis,J.R.William**.Modern architecture since 1900.Prientice-hall,inc.,New Jersey,2002.

ASSIGNMENTS:

Writing Assignments from the questions framed from different units of syllabus, and sketching/model making of different examples of buildings.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR312(C 16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	1	3	3	2	2	-	1	1	-	1	-	1		-	-	-	3
CO3	2	3	2	2	2	1	1	1	-	2	1	-		-	1	-	3
CO4	2	2	2	2	2	1	1	1	-	1	1	-		1	-	-	3
CO5	3	3	1	1	2	-	2	-	-	1	-	-	1				
Total	10	15	12	09	09	05	06	-	-	07	02	04	02	03	02	-	15

AR 313(C16) : DESIGN OF STRUCTURES: RCC- II

Periods / Week :4
Periods / Semester :72
Credits :4
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Exam)

TIME SCHEDULE

S.No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I- Design of columns (Limit State Method)	10	10	1	1
2.	Unit–II-Design of one way Slabs (Limit State Method)	16	16	-	2
3.	Unit– III - Design of two way Slabs (Limit State Method)	10	8	-	1
4.	Unit–IV - Foundation Techniques – RCC	8	12	2	1
5.	Unit–V - Design of RCC Isolated footings	10	8	-	1
6.	Unit–VI – Defections & Crakings	10	10	1	1
7	Unit-VII - Advanced Construction Techniques in RCC	8	10	1	1
	Total:	**72**	**74**	**5**	**8**

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

This course focuses on structural design of different RCC elements (columns, footings,)
Formation of soil & foundation techniques & advanced construction techniques in RCC.

COURSE LEARNING OBJECTIVES:

- This course focuses on structural design of different RCC elements (columns, footings,)
- Formation of soil & foundation techniques & advanced construction techniques in RCC
- To develop the structural design skills in RCC elements

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To identify the type of columns and design of it
CO 2	To understand the requirements for RCC slab and design requirements
CO 3	To understand the Situations where doubly reinforced beams are used, analysis and design
CO 4	To understand the foundation techniques in soil and types of foundations
CO 5	Design of RCC Isolated Footings
CO 6	To understand the advanced Construction Techniques in RCC

COURSE CONTENTS:

Unit I

Design of Columns – (i) Design of RCC columns axially loaded subjected to BM about one and two axis using limit state method only.

Unit II

Design of One way - Slabs: (i) Introduction, (ii) Design of One way reinforced slabs (simply supported) by limit state method only.

Unit III

Design of Two Way Reinforced Slabs - Slabs: (i) Introduction, Design of two way reinforced slabs (simply supported, Restrained, continuous) by limit state method only.

Unit IV

Foundation Techniques – RCC – (i) Introduction, (ii) Soil Classifications, (iii) compaction of soils, (iv) Shallow foundations, (v) Deep foundations, (vi) Well foundations and (vii) Foundations in expansive soils.

Unit V

RCC Isolated Footings – (i) Design of RCC Isolated footings for columns (a) Square and (b) Rectangle) - working stress method only.

Unit VI

Defections & Cracking – (i) Span-effective depth ratio, (ii) Calculation of short term & long term Defections, (iii) Craking & Bar spacing controls.

Unit VII

Advanced Construction Techniques in RCC – (i) Introduction- (a) Basic concepts of prestresing, (b) Historical development, material need for high strength steel & high strength concrete, (ii) Advantages of prestresed concrete, prestressing systems (Freyssinet system, Lee-Mccall system & Gifford – Udall system)

REFERENCE BOOKS:

1) **A.K.Jain.** Reinforced Concrete: Limit State Design, 5th ed. New Chand and Bros., Roorkee, 1999.
2) **Ramamrutham. S. and Narayan, R.** Design of RCC Structures, 12th ed. Dhanpat Rai Pub. Co. Pvt. Ltd., Delhi, 1998.
3) **Prestressed concrete by N.Kirshna Raju**, Tata Mc Graw-Hill Publishing company limited, New Delhi.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR 313 (C16)	Program Outcomes Pos												Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2	1	-	1	-	1	1	-	-	-	1	3	-	-
CO2	1	2	2	2	2	-	1	-	-	-	-	-	-	3	-	-
CO3	2	3	2	2	2	-	-	-	-	-	-	-	1	3	-	-
CO4	1	3	3	2	2	1	1	-	-	-	-	-	1	3	-	-
CO5	1	3	2	2	1	2	1	-	-	-	-	-	-	3	-	-
Co6	2	2	1	2	3	1	2	-	-	-	-	-	-	-	-	-
Total	07	16	11	09	07	04	03	01	01	-	01	-	03	15	-	-

AR 314(C16) : BUILDING CONSTRUCTION-V

Periods / Week : **04**
Periods / Semester : **72**
Credits : **04**
Internal Assignments & Mid : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs. (University Exam, Drawing & Theory)**

TIME SCHEDULE

S. No	Major Topics/Units	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1	Unit – I: Failures	8	10	-	1
2	Unit – II: Timber	8	12	1	1
3	Unit – III: Bricks	8	10	-	1
4	Unit – IV: R.C. Concrete:	12	12	1	1
5	Unit-V: Methodical approach to Repairs	20	14	2	1
6	Unit – VI: Unusual problems	16	12	1	1
	Total:	**72**	**70**	**5**	**6**

Note:

1) **1.** Duration of examination is for 4 hours without any break and the questions to be framed as per the given table above
2) **2.** Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists of 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 6 essay questions out of which 4 to answer (2 are choice) and each carries 10 marks.

COURSE OVERVIEW:

Course focuses on issues related to failures in buildings, decay and damage, approaches for maintenance, repairs and renovation of buildings.

COURSE LEARNING OBJECTIVES:

To create awareness among the students regarding problems related to old buildings and methods to mitigate their problems.

COURSE OUTCOMES:

CO1	Students can understand a detailed study of building failures.
CO2	Students should be able to known fundamentals Factors reducing strength of timber, repair, Treatment.
CO3	Students should be able to learn Importance of strength reducing factors in brick work, construction defects Repair and maintenance.
CO4	Students should be able to reinforced concrete structure Mixing methods at site, their problems
CO5	Students should be able to known fundamentals of Methodical Approach to Repairs , - Unusual problems. and they create technical Drawings for Various types of Staircase. buildings available and to do documentation on the problems in old buildings

COURSE CONTENTS:

Unit I

Failures: (i) Introduction to building failures: (ii) Causes of decay and damage in old buildings, (iii) Issues of maintenance and repair. (iv) Preliminary inspection and general observation, (v) Decayed elements difference between decay and damage.

Unit II

Timber: (i)Moisture content, (ii) Treatment prior to installation, (iii) Factors reducing strength of timber, (iv) Approach to repair and to the timber roofing system.

Unit III

Bricks: (i)Strength reducing factors in brick work, (a) Effect of ageing, (b) Weathering, (c) Temperature variation of brick-work, (d) Joints and cracks, (e) construction defects, (f) Repair and maintenance

Unit IV

R.C. Concrete: (i) Mixing methods at site, (ii) Structural design for repairs, (iii) Causes of failure in concrete structures, (iv) Pressure-grouting.

Unit V

Methodical Approach to Repairs: (i) Cracks over openings, (ii) Sinking and sagging of balconies, (iii) Repairs to decayed floors and floor joints, example: (a) Jack arch roof, (b) Madras terrace roof, (c) Foundation sinking, and (d) Repairs to walls. (e) Propping, (f) Strutting and (g) Under pinning..

Unit VI

Unusual problems: (i) Repairs to large span rooms, (ii) Water proofing the roof terraces, (iii) Leakages from toilets & wet areas, (iv) Case study and site visits (a report has to submit on the case study done by the students following the note below)

REFERENCES BOOKS:

1) **Feilden, M**. Bernard. Conservation of Historic Buildings. Butterworth Scientific, London, 1992.
2) **McKay, W.B**. Failures and Repair of Concrete Structures Vol. IV.
3) **Raikar, R.N.** Learning From Failures: Deficiencies in Design. Construction and Service, R and D Centre, New Bombay, 1987.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR 314 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1									3		3	-	-	
CO2		2		1								3		3	-	-	3
CO3		2	1						1	3	1	1		3	-	-	
CO4	1	2		1								3		3	-	-	
CO5		1	1					1				3		3	-	-	3
Total	2	09	03	02				1	1	3	02	13		15	-	-	6

AR 315(C16) : BUILDING SERVICES: LIGHTING AND ELECTRICAL

Periods / Week : **03**
Periods / Semester : **54**
Credits : **03**
Internal Assignments & Mid : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3Hrs (University Exam, Drawing & Theory)**

TIME SCHEDULE

S. No	Major Topics/Units	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1	**Unit – I** Fundamental principles of Electricity	9	16	-	2
2	**Unit – II** Building Wiring System	9	10	1	1
3	**Unit – III** Electric layouts	3	10	1	1
4	**Unit – IV** Building lighting system	9	10	1	1
5	**Unit – V** Lighting Calculation	6	8	-	1
6	**Unit – VI** Principles of air-conditioning	9	10	1	1
7	**Unit – VII** Types of Air-conditioning	9	10	1	1
	Total:	**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 4 hours and the questions to be framed as per the given table above
2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &
(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

Study of Building Services and Utilities generally installed in buildings and their role in enhancing

utilitarian value of the buildings. The study to focus on understanding basic working, principles, terms and definitions, as well as practical aspects and solutions utilized in architecture.

COURSE LEARNING OBJECTIVES:

- To gain knowledge regarding layout of utilities and services in the building envelope, functioning of service and their applications in building.
- To understand the Building Services and Utilities generally installed in buildings and their role in enhancing utilitarian value of the buildings.
- To understand the basic working, principles, terms and definitions, as well as gain knowledge in practical aspects and solutions utilized in architecture.
- To gain knowledge of the Building lighting systems and lighting calculations
- To understand the Principles of Air-conditioning
- To provide students with the skills and knowledge needed to design, install, and maintain safe and effective lighting and electrical systems for buildings.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To demonstrate a comprehensive understanding of the fundamentals of electrical systems, including basic principles, circuits, wiring, and safety considerations.
CO 2	To understand the lighting design principles, including illumination levels, colour temperature and light distribution.
CO 3	To evaluate different types of lighting and electrical equipment, and select the most appropriate equipment based on the needs of the project.
CO 4	To understand and comply with building codes, standards, and regulations relating to lighting and electrical systems.
CO 5	To design and prepare drawings and specifications for lighting and electrical systems, including calculations and layouts.
CO 6	To understand the energy efficiency and sustainability issues related to lighting and electrical systems, and be able to incorporate appropriate measures into their designs

UNIT I

Fundamental principles of Electricity: (i)Voltage, Amperage, wattage, generation, and transmission of power (ii) Distribution in cities, HT and LT consumers, Transformers and load calculations, Single and three phase connections (iii) Indian Electricity rules., Types of Generators, UPS

UNIT II

Building Wiring System: (i) Service wires, metering, light and power circuits.(ii) electrical safety devices (iii) MCB, ELCB, distribution boards, wiring methods, ISI Codes and standard materials (iv) Conductors, switch boards, electrical points in general building, pipe earthing, plate earthing.

UNIT III

Electric layouts: (i) Electrical symbols (ii) NBC (iii) preparation of layouts for residences, offices (iii) construction and working of at least six domestic appliances, location in buildings (iv)Types of electric motors and pumps.

UNIT IV

Building lighting system: (i) Artificial illumination, various types of lamps, advantages and disadvantages (ii) Method of lighting, direct, semi direct, indirect, concealed lighting, spot lighting, task lighting, decorative lighting, rope lights, neon lights, flood lighting, yard lighting, under water lighting.(iii) Specific lighting design requirement of different buildings such as homes, offices, industrial, hospital, art galleries, museums and exhibitions, case study of at least one type of the building by each student.

UNIT V

Lighting Calculation: (i) NBC standards, nominal illumination levels in building interiors, lux, lumen, intensity, lighting schemes. (ii) Conservation of energy in lighting use of daylight, optical fiber lighting, LED in lighting and the emerging trends in lighting. (iii) Out door lighting: road lighting, high-mast lighting, tunnel lighting, landscape lighting, decorative lighting, facade lighting, spot lighting.

UNIT VI

Principles of air-conditioning: IAQ, comfort conditions, gas laws, refrigeration cycle, a/c equipment, compressor heat exchangers, condenser and evaporators

UNIT VII

Types of Air-conditioning: (i) single zone, multi zone, window air conditioners, split air conditioners, ductable air conditioners (ii)package system and central air conditioning,all air systems and chilled water systems and a/c plant room (iii) AHU's Building ducting, diffusers and grills, FC units.

COURSREFERENCE BOOKS:

1) Moore, Fuller. Concepts and practice of Architectural Day Lighting. Van Nostrand Reinhold co., New York, 1985.

2) **Valia, Anil.** Designing with light: A Lighting H.B. International Lightning Academy, Mumbai, 2002, Architecturl Physics: Lighting.

3) **Hopkinson R.G,** Her Majestrip stationery office, London.

4) **David Egan. M,** concepts in Architectural lighting Mc Grew Hill Book company, New York, 1983.

5) **Electrical wiring and Contracting (Vol.1 to Vol.4),** London The New era Publishing Company.
6) **Dr. Frith Abnwos and others,** Electrical Engineering hand Book.
7) **William. J. Guinnesss,** Mechanical and electrical Equipment for Buildings, New York: Willey.
8) **Bovay. H.E.,** Handbook of Mechanical and Electrical Systems for Buildings New York: MC Graw Hill.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR315(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	-	2	-	-	1	1	-	1	1	1	2	1	1	1	1	1
CO2	1	-	1	-	-	1	1	-	1	-	1	2	1	1	1	1	1
CO3	1	-	1	-	-	1	1	1	-	1	1	2	1	1	1	1	1
CO4	1	-	1	-	-	1	1	-	1	1	1	2	1	1	1	1	1
CO5	1	-	1	-	-	1	1	-	1	1	1	2	1	1	1	1	1
CO6	1	-	1	-	-	1	1	-	-	1	1	2	1	1	1	1	1
Total	6	0	7	0	0	6	6	1	4	5	6	12	6	6	6	6	6

AR 316(C16) : BUILDING CODES AND BYE LAWS

Periods / Week : 3
Periods / Semester : 54
Credits : 3
Internal Assignments & Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
	Unit-I – Introduction to Building Codes and Norms	6	8	-	1
	Unit-II - Study of Building regulations	8	10	1	1
	Unit – III - Norms for Vehicular Areas	6	8	-	1
	Unit-IV - Norms For Fire Protection	6	8	-	1
	Unit-V - Norms For Building Services	12	20	2	2
	Unit – VI - Requirements For Parts Of Buildings	6	10	1	1
	Unit – VII - Introduction To Local Building Byelaws	8	10	1	1
	Practical Exercise (compulsory):-	2	-	-	-
TOTAL:		**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above
2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE LEARNING OBJECTIVES:

- Understanding the legal requirements: Building codes and bylaws are enforced by law and are intended to ensure the safety and health of occupants. As an architecture student, you will learn about the legal requirements of building codes and bylaws and how to design buildings that comply with them.
- Ensuring safety: The primary objective of building codes and bylaws is to ensure the safety of occupants. By studying these regulations, you will learn how to design buildings that are structurally sound, fire-resistant, and safe for occupancy
- Enhancing accessibility: Building codes and bylaws also include regulations that ensure buildings are accessible to all individuals, including those with disabilities. As an architecture student, you will learn how to design buildings that meet accessibility requirements and provide equal access for all.
- Promoting sustainability: Building codes and bylaws also include regulations that promote energy efficiency and sustainability. As an architecture student, you will learn about these regulations and how to design buildings that are environmentally sustainable.
- Meeting client needs: Building codes and bylaws are essential considerations when designing buildings. Understanding these regulations will help you design buildings that meet the needs of your clients while also complying with legal requirements.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To Understand and interpret building codes and byelaws, terminology and rules of the various regions
CO 2	Analyze and evaluate the various building regulations
CO 3	Analyze and evaluate the various vehicular regulations
CO 4	To design buildings that are structurally sound, fire-resistant, and safe for occupancy

CO 5	To apply the principles and concepts of building services, design appropriate system and integrate building services with architectural design and communicate effectively with other professionals
CO 6	To understand and apply the various internal norms of the buildings
CO 7	To develop the various local, state and national regulations

COURSE CONTENTS:

Unit I

Introduction to Building Codes and Norms:-

(i) Need and nature of building codes, (iii) Basic Terminology used in Building Codes and Bye- Laws (iii) Standards and Regulations, (iv) Nature of Building Codes in Special Regions (such as

(a) Heritage Zones, (b) Air Funnels, (c) Environmentally Sensitive Zones, (d) Disaster Prone Regions, (f) Coastal Zones, (g) Hilly areas, (h) Introduction to Industrial Area Local Authority (IALA)/Special Economic Zone (SEZ) notified by Government. etc.

Unit II

Study of Building regulations:-

(i) General Land-use, (ii) Buildings Classifications and Permissible Uses; (iii) Norms for Exterior Open Spaces, (iv) Norms for Interior Open Spaces, (v) Setbacks and Margins, (vi) Norms for Building Projections into Open Spaces, (vii) Considerations in FAR, (viii) Guidelines for Open Green Areas.

Unit III

Norms for Vehicular Areas:-

(i) Means of access, **(ii)** Norms for Access Widths for Various Types of Buildings, **(iii)**Requirements of Parking Spaces, **(iv)** Standards For Turning Radius and If Ramps are provided their Slope / Gradient (for Motor Cycles, Cars, Buses and Lorries), **(v)** Access To Service Areas.

Unit IV

Norms for Fire Protection:-

(i) Overview Of Fire Protection Norms For Various Buildings Classified, (ii) Norms For Fire-Exit Ways And Building Materials, (iii) Concept Of Fire Zoning, (iv) Doorways, (v) Stairways,

(vi) Passages and Corridors, (vi) Fire Escapes Etc.

Unit V

Norms For Building Services:-

(i) Norms For Lighting And Ventilation, (ii) Introduction To Basic Terminologies, (iii) Components Of Daylight Factor, (iv) General Principles Of Openings For Good Lighting, (v) Considerations In Artificial Lighting; (vi) General Principles For Natural And Mechanical Ventilation, (vii) Overview Of Norms For Acoustical Installations And (viii) Over view of Norms for Electrical Installations.

Unit VI

Requirements for Parts of Buildings:-

(i) Plinth, (ii) Habitable Rooms, (iii) Kitchen, (iv) Wet Areas, (v) Mezzanine, (vi) Store Rooms, (vii) Basement (cellar) (viii) Stilt, (ix) Elevated Parts Like Chimneys, (x) Parapets, (xi) Staircase Head Rooms, (xii) Mechanical Lifts Machine Room, Etc.

Unit VII

Introduction to Local Building Byelaws (with reference to prevailing / Latest Government Orders (GOs from Ministry of AP Municipal Administration and Urban Development) :-

Study Of Local Administrative Provisions For Obtaining Building Permits, (ii) A Practical Exercise on Latest System / Method / Procedure of Obtaining Building Permit from Local Authorities, (iii) Architectural Control And Provision Of Building Services, (iv) Regulations For Super Structures, (v) Building Height Regulations, (vi) Regulations For Multi-Storied Buildings Etc.(vii) Regulations for Multiplex Malls and Entertainment complexes.

Practical Exercise (compulsory):- (Online Procedure / Pre DCR Procedure / any relevant software application applicable – a practical to be conducted calling a professional person as a resource person from outside who is having practice of doing the same which may be conducted either in the Institution or at the Office of the resource person in learning the application of the soft ware and requisites upload or feed for approval plans online and its procedure)

COURSREFERENCE BOOKS:

1) **Bhagiratha Rao, E.L.** Land Acquisition Manual In Andhra Pradesh.
2) **Buch, N. Mahesh.** Planning The Indian City.
3) **Chand, Mahesh And Puri, Vinay Kumar.** Regional Planning In India. Allied Pub. Ltd.,Bombay, 1990.
4) **Gallion, B. Arthur And Eisner, Simon.** Urban Pattern: City Planning And Design, 5th Ed. VanNostrand Reinhold, New York, 1986.

5) **Hyderabad Urban Development Authority.** Hyderabad Urban Development Authority, Huda,1981.
6) **Khosla, R.K.** Urban And Rural Development In India, Delhi: Indian Publishers & Distributors.
7) **Patterson, T. William.** Land-Use Planning Techniques Of Implementation.
8) **Rama Reddy, Padala And Srinivas Reddy, Padala.** Commentates On Land Reforms Laws InAndhra Pradesh.
9) **Rame Gowda, K.S.** Urban And Regional Planning. Univ. Of Mysore, Mysore, 1972. **Rangwala, S.C. And Others.** Town Planning, 18th Ed. Charotar Pub. House, Anand, 2003.**Singh, Alok Kumar, and Others (ed).** Strategies in Development Planning.
10) **Durga Prasad, M.V.** Law of Flats, Apartments and Buildings, 4th ed. Asia Law House,Hyderabad, 1997.
11) Hyderabad Municipal Bye laws.
12) **Indian Standards Institution.** National Building Code of India 2005. Indian StandardsInstitution, New Delhi,
13) **Scott, G. James.** Architectural Building Codes, New York: Vanstrand Reinhold.
14) **Latest GOs** on byelaws of Andhra Pradesh state by the Municipal Administration and Urban Development Department – Director of Town and Country Planning Department – Andhra Pradesh Capital Region Development Authority.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes : AR 316(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	1	2	3	1	3	2	2	1	3	3	2	1	1
CO2	2	3	3	2	1	1	3	-	3	1	-	2	3	3	2	1	1
CO3	3	3	2	3	1	1	3	-	3	1	-	1	3	1	2	-	1
CO4	3	3	2	2	1	2	3	2	3	1	2	2	3	2	2	-	1
CO5	2	3	2	2	3	2	2	2	3	1	1	2	3	2	3	-	1
CO6	3	3	2	2	1	1	3	-	3	1	-	2	3	2	2	1	1
CO7	3	3	2	3	1	2	3	1	3	2	1	1	3	3	3	1	1
Total	19	21	15	17	09	11	20	06	21	09	06	11	21	19	16	04	07

AR 317(C16) : COMPUTER APPLICATIONS - III

Digital Lab Periods/Week :4
Digital Lab Periods/Semester :40
Credits :4
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :2Hrs (Lab & Viva) Practical Exam

TIME SCHEDULE

S. No	Major Topics	No. of periods
1	Introduction to Digital Theory	10
2	3D Modeling and different methods	15
3	Scene setup	15
4	Building Information Modeling	22
5	3D Printing	10
	Total	72

Note: Examination Procedure:

1) Lab – Practical Examination.
2) 3 hrs duration.
3) The question paper to be set by external examiner in coordination with internal examiner (Paper setting remuneration shared equally by both).
4) Student's examination answers outcome from the system to be taken into hard copies mentioning only Hall Ticket Numbers and submit for valuation to the in-charge concerned for valuation.
5) Outcome of hard copies of the practical work done by the candidates will be evaluated as specified in the table given below.

S.No	Description of task	Marks Maximum	Marks Awarded
01	Procedure followed	10	
02	Final outcome of the work(s)	30	
03	Viva	10	
04	**TOTAL**	**50**	

COURSE OVERVIEW:

The subject focus is in the area of computational media techniques and technologies and their impact on architectural design and production.

COURSE OBJECTIVES:

- At the end of this part of the course the students should be able to create three dimensional objects in space, which can also be used for the purpose of presentation as well as visualization using different rendering techniques.
- EXPECTED SKILLS / KNOWLEDGE TRANSFERRED: Knowledge on software's required for architectural presentations, Revit Architecture, 3DS MAX, Photoshop, etc.,

COURSE OUTCOMES: By the end of this course, students will be able to:

CO 1	Create complex 3D models using advanced modeling techniques.
CO 2	Use rendering tools to create photorealistic images and animations of their models.
CO 3	Understand the principles of Building Information Modelling
CO 4	Analyze their models using advanced analysis tools to evaluate structural, environmental, and other performance factors.
CO 5	Develop advanced presentation skills using Adobe Creative Suite and other software tools.

COURSE CONTENTS

Unit I

Introduction to Advance rendering from Raster graphic tools and Vector tools Introduction to 3D Modeling Overview of 3D modeling software and techniques, Creating and manipulating 3D objects, Navigating in 3D space, Basic rendering techniques

Unit II

Advanced 3D Modeling, Advanced modeling techniques and tools, Creating and editing complex 3D objects, adding materials and textures to 3D models, Lighting and camera setup for 3D rendering

Unit III

BIM and Parametric Modeling Introduction to Building Information Modeling (BIM) Using BIM tools for design and construction documentation, Collaboration and file management with BIM software

Unit IV

Animation and Visualization, Introduction to animation software for architecture, Creating walkthroughs and flyovers of 3D models, Exporting animations for presentations. Techniques for creating compelling visualizations of architectural projects.

Unit V

Project Development and Critique, working on final projects, Refinement of projects based on feedback.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR 317 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	2	2	3	1	0	0	0	3	2	2	3	2	2	1
CO2	3	3	1	2	2	2	1	0	0	0	3	2	2	3	2	2	1
CO3	2	1	3	2	2	3	1	0	0	0	3	2	2	3	2	3	1
CO4	3	3	2	2	2	1	1	0	0	0	3	2	2	3	1	2	1
CO5	2	2	3	2	2	3	1	0	0	0	3	2	2	3	2	2	1
Total	10	12	12	8	8	12	6	0	0	0	15	8	10	15	7	7	5

AR 318(C16) : ARCHITECTURAL DESIGN – IV

Periods / Week : **09**
Periods / Semester : **162**
Credits : **09**
Internal Assignments & Mid's : **200 Marks**
External Examinations : **200 Marks**
Total Marks : **400 Marks**
Duration of Exam : **Viva – Voce**

TIME SCHEDULE

S.No.	Major Activities	No. of periods			Weightage of marks	
		Major Problem-1	Major Problem-2	Total	Internal	External
Major Problems 2 Nos						
1.	Data Collection: Literature & Standards Study	04	04	08	30 (15 for each major problem)	---
2.	Desktop Study	04	04	08		
3.	Case Studies	13	13	26		
4.	Site Analysis and Area Statements	09	09	18	100 (50 for each major problem)	150
5.	Conceptual design proposals	09	09	18		
6.	Final Design Portfolio	36	36	72		
		Sub-total		150		
Minor Problem 1 No						
7.	Time Problem (from one of the minor problems)			12	50	50
8.	Attendance				20	---
	Total:			**162**	**200**	**200**

Note:

1) At least two major problems and one minor design/time problems should be done by students.
2) The final submission shall necessarily include a model for at least one of the two major problems.
3) In the end exam which is a viva-voce the students are to present the entire semester work for assessment.

COURSE OVERVIEW:

This course focuses on the discipline of institutional design and detailing skills required for the design of institutions in urban contexts.

COURSE LEARNING OBJECTIVES:

1) Design exercises that explore Architecture as responding to various aspects such as contextual, social, economic, cultural and Standards issues.
2) To develop the design according to the user requirements with implementing innovation and aesthetics.
3) To design, keeping in mind the standard norms followed for each type of building.
4) Study of the physical, socio economic and cultural aspects of a selected place to Understand the settlement pattern and amenities that are existing or required
5) Nature of contemporary institution, correlation to urban structure.
6) Various attitudes to building in urban context.
7) Institutional character – from abstract to detail.
8) User behavior and requirements pertaining to the physically handicapped. Necessary theoretical inputs to be given highlighting the norms and design issues The topics not covered as studio faculty members through lecture/slide shows and site visits may cover design problems.
9) Exploration of spaces for study and interaction - Studying the function, circulation and zoning. Study of the quality of natural light under various circumstances and its transformation in interiors due to location, size and material – Use of high openings, clearstory, courtyards and other contraptions to bring light into the interior of buildings. To analyze spaces like corridors, lobbies, courtyards etc. that can be designed to foster interaction.
10) At the end of the course work, the students would be able to understand about the importance of designing with norms and trying to solve various design issues.
11) Learning and understanding the design response to various trends in architecture.
12) Integration to function and movement, climate, and sound, structure and services into group of buildings.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Develop an understanding of the history and theory of public architecture understanding public building design and its role in shaping communities and societies. Analyze and critique examples of public buildings and spaces, including their social, cultural, and political significance, and how they contribute to the built environment. Organization of functional activities in relation to user requirements and the site. Relating the system of horizontal and vertical circulation, open spaces, parking etc
CO 2	Understand the legal and regulatory frameworks that govern public building design, including accessibility, safety, and sustainability standards. Responding to socio-economic factors such as income levels, privacy, territoriality, interaction etc
CO 3	Develop design skills in the context of public architecture, including conceptualization, planning, and presentation. Understand the relationship between form, function, and aesthetics in public building design, and how to balance these factors in a design proposal. Considering materials, structure and services in relation to the design proposal
CO 4	Develop skills in collaborating with stakeholders, such as clients, users, and other professionals involved in the design and construction of public buildings. Develop skills in the use of digital tools and technologies to support the design and visualization of public buildings, including computer-aided design (CAD) software and virtual reality (VR) tools. Integration of plan forms and three-dimensional compositions. Design & detailing for the physically challenged and the elderly persons
CO 5	Understand the importance of sustainability and energy efficiency in public building design, including the use of renewable energy sources and green building practices. Develop skills in communicating design ideas and concepts effectively, including through verbal, written, and visual means.

COURSE CONTENTS

Major Problems:

Architecture college (ii) Business college (iii) Law college

Engineering college with Departments like Civil, Computer science, Mechanical, Electrical and Electronics

Arts college with Departments like Telugu, English, Hindi, History and Archaeology

Science college with Departments like Biotechnology, Biochemistry, Botany & Microbiology, Chemistry, and Mathematics

100 to 200 Bedded Hospital

Minor Problems:

Music and Dance school (ii), Moot court (iii) Telephone bhavan (BSNL)etc. (iv)
Reformatories and rehabilitation institutes for the disabled.

Necessary theoretical inputs to be given highlighting the norms and design issues. The topicsnot covered as design problems will have to be covered by the Studio faculty members through lecture/slide show sessions and site visits.

Internal submission:

1) Study of Literature & Standards, Desktop existing relevant examples and Case studies on existing live examples are essential for every major & minor problem. And a comparative analysis of all the said studies projecting inferences.
2) Site analysis, design methodology & conceptual design development including area statements to be prepared.
3) Drawings along with amodel for one of the major problems.
4) Each design problem to be submitted in the format given.
5) of each design to be manually drawn with the required parameters which includes Designs showing detailed plans, sections, elevations, perspectives

COURSREFERENCE BOOKS:

1) **Chiara Joseph de and Others.** Time Savers Standards of Building Types. McGraw – Hill, 1990.
2) **Neufert, Ernst. Ernst Neufert Architects Data**, Granada Pub. Ltd., London, 2000.
3) **Peloquin, Albert.** Barrier-Free Residential Design. McGraw-Hill, Inc., New York, 1994.
4) **Pevsner, Nikolaus.** A History of Building Types. Thames and Hudson, London, 1976.
5) **Shah, S. Charanjit.** Architects Hand Book Ready Reckoner. Galogotia Pub., New Delhi, 1996.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes: AR 318(c16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	2	3	2	3	3	2	2	1	3	2	3	3	3	3
CO2	3	2	2	3	2	3	3	3	3	2	1	3	2	3	2	3	3
CO3	3	3	2	2	3	2	3	3	2	2	1	3	2	3	3	3	3
CO4	3	2	2	3	2	3	3	3	3	2	1	3	2	3	2	3	3
CO5	3	3	2	2	3	2	3	3	2	2	1	3	2	3	3	3	3
Total	15	13	10	12	13	12	15	15	12	10	5	15	10	15	13	15	15

AR 321(C16) : GREEN BUILDING CONCEPTS

Periods / Week : **3**
Periods / Semester : **54**
Credits : **3**
Internal Assignments & Mids : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3 Hrs (University Exam)**

TIME SCHEDULE

S. No.	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit – I: Green Buildings	5	10	1	1
2	Unit – II: Introduction to Green Building council	5	10	1	1
3	Unit – III: Different Types of Renewable Energies and Goals of Green Buildings.	9	18	1	2
4	Unit – IV: Climate and its role in green buildings	9	10	1	1
5	Unit – V: Environmentally friendly building materials	10	10	1	1
6	Unit – VI: Building Resources	5	8	-	1
7	Unit – VII: Introduction to Sustainability	5	8	-	1
8	Case Study	7			
Total		**54**	**74**	**5**	8

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above
2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

GREEN CONCEPTS

The course focuses on understanding, developing the practices and Designing of Buildings that are environmentally responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction. These practices expand and complement the classical building design concerns of economy, utility, durability, and comfort. Green building is also known as a sustainable or high performance building. Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment. The emphasis is to gain an understanding with regard to the existing concepts, ideas and processes in Architecture and built environment and also recognize rapidly emerging building solutions and technological initiatives that complement current practices in order to attain human health and environmental goals.

COURSE LEARNING OBJECTIVES:

- To develop skills to promote ecofriendly characteristics in the area of Architecture and construction industry and identify crucial technologies, facilities and applications that help in developing green buildings.
- To address issues like water efficiency, energy efficiency, reduction in fossil fuel use in commuting, handling of consumer waste and conserving natural resources in the area of Architecture form planning, designing, construction and long run maintenance of the buildings and to enhance occupant health, happiness and well-being.
- To understand low impact construction practices, life cycle costs and alternative energy resources.
- To familiarize the students with the various rating systems for building practices.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To understand and develop the practices and Designing of Buildings that are environmentally responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction.

CO 2	To understand the green building rating systems such as LEED, GRIHA, BREEAM and TERI and to use these systems to evaluate and compare the environmental performance of buildings.
CO 3	To understand and evaluate green building materials and technologies, including renewable energy systems, low-emitting materials, and water-saving devices.
CO 4	To investigate and assess the environmental impact of buildings including their energy and water use, and the emissions generated by their construction and operation.
CO 5	To understand and analyse the policy and regulations related to green building, including local, state, and federal regulations. They should also know how to apply this knowledge to design and construction projects.
CO 6	To understand with regard to the existing concepts, ideas and processes in Architecture and built environment and also recognize rapidly emerging building solutions and technological initiatives that complement current practices in order to attain human health and environmental goals.

COURSE CONTENTS

UNIT I

Green Buildings:

1. Definition of Green Buildings.
2. Introduction to concept of Green
3. Why to go for Green Building How the green buildings Different from other buildings.
4. Benefits of Green Buildings.

UNIT II

Introduction to Green Building council

1. Various Green councils in the world, Aims & Objectives.
2. Indian Green Building Council.
3. Introduction to various Rating system – LEED, GRIHA, BREEAM, TERI etc.
4. Indian Green Building council Rating Systems.

UNIT III

Different Types of Renewable Energies and Goals of Green Buildings.

Renewable Energy sources that can be used in Green Buildings – Solar energy, Passive Solar Heating, Passive Solar collection, Wind and other renewable. A passive solar strategy, Photovoltaic's, Climate and Energy, Macro and Microclimate. Indian Examples.

Life cycle assessment, Siting and structure design efficiency, Energy efficiency, Water efficiency, Materials efficiency, Indoor environmental quality enhancement, Operations and maintenance optimization, Waste reduction, Reduce impact onto electricity network, Cost and payoff, Regulation and operation

UNIT IV

CLIMATE AND ITS ROLE IN GREEN BUILDINGS :

1. Macro and Micro climate, Elements of climate, weather, Water cycle, Carbon cycle, Environmental quality.
2. Micro-environment: Natural environment ,built environment, living environment Characteristics and components of Urban Ecosystem solar radiation, heat flow, air-movement, Land use, drainage and sanitation.
3. Local climatic conditions – temperature, humidity, wind speed and direction-impact of climate change on built environment .

UNIT V

Environmentally friendly building materials:

Natural Materials like bamboo, timber, rammed earth, stabilized mud blocks, hollow blocks, lime & lime- pozzolana cements, materials from agro and industrial waste, Ferro-cement and ferro-concrete, alternative roofing systems, various paints reducing the heat gain of the building, etc.

UNIT VI

Building Resources:

1. Green building Techniques – Various techniques for passive cooling and Passive energy system Design,
2. Thermal comfort and Principles of thermal design – means of thermal –light and lighting
3. Building acoustics- energy efficient lighting, Ventilation and air quality requirement, , garden roofs, case studies for passive cooling and.
4. Building envelope, orientation and components of building fabric and Shading, High rise buildings, modular building Construction, curtain walls, Sourcing and recycling of building materials, alternative Calcareous, metallic and non metallic, materials
5. Building Infrastructure: Active Energy Systems in buildings, Utilities and services, building automation. electro-mechanical systems, lifts and transportation, captive power plant and equipment, operation & maintenance.

UNIT VII

Introduction to Sustainability

1. Definition of Sustainability.
2. Introduction to concept of Sustainability
3. Relation and difference between the concepts of Green and Sustainability.

UNIT VIII

Case study and Report

1. A Detailed Case study has to be done comprising the Green building aspects of an Existing structure and premises which is rated by the IGBC and a report has to be submitted comprising Pictorial and User reviews in the portfolio format.
   (Note: This is a compulsory assignment which carries 25 marks and which will be considered among two assignments out of three assignments.)

REFERENCE BOOKS:

1) **Micheal J. Bednar. "Barrier Free Environments", Dowden, Hutchinson and Ross, Ive 1977.**
2) **Ministry of Urban Affairs and Employment. Central Public Works Department, India, "**Guidelines and Space Standards for Barrier Free Environment for Disabled and Elderly Person, 1998.
3) **Unnati.** "Design Manual for a Barrier – Free Built Environment", Handicap International, December, 2004.
4) **Green Building Technologies** - Godrej Centre CII a Madhapur, Hyderabad.
5) **Greening Building** – Green Congress, US.(web).
6) **HSMI. Sustainable Building Technology** – HUDCO, HSMI (Human Settlement Management Institution, New Delhi.
7) **Koenigsberger, O.H. and Others.** Manual of Tropical Housing and Building. Orient Longman, Chennai, 2003.
8) **Odum, P. Eugene.** Ecology and Environments, 2nd ed. Oxford and IBH Pub., New Delhi.
9) **TERI, The Building Energy Audit** – TERI (Tata Energy Research Institute).
10) **HMDA Hyderabad-** Green building guidelines.

Alternative building materials and technologies' by K.S. Jagadish, B.V. Venkatarama Reddy and K.S. Nanjunda Rao.

Non-Conventional Energy Resources' by G. D. Rai, Khanna Publishers.

- Handbook on Green Practices published by Indian Society of Heating Refrigerating and
- Air conditioning Engineers, 2009.
- Green Building Hand Book by Tomwoolley and Samkimings, 2009.

RECOMMENDED REFERENCE BOOKS:

- Complete Guide to Green Buildings by Trish riley
- Standard for the design for High Performance Green Buildings by Kent Peterson, 2009

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR321 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	2	2	1	1	2	1	1	1	1	-	2	1	3	1
CO2	2	2	2	1	2	2	1	2	1	1	1	1	1	2	2	2	1
CO3	2	2	1	1	-	-	1	-	1	1	-	3	-	2	2	2	1
CO4	2	2	1	1	1	-	1	1	1	1	-	1	-	2	2	2	1
CO5	2	2	2	1	-	-	1	-	1	1	-	1	1	2	2	2	1
CO6	2	2	1	2	1	-	1	1	1	1	-	1	-	2	1	1	1
Total	10	10	10	8	6	3	6	6	6	6	2	8	2	12	10	12	6

AR 322(C16) : CONTEMPORARY ARCHITECTURE

Periods / Week : 3
Periods / Semester :54
Credits : 4
Internal Assignments & Mids. :50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions Part-A	Essay Questions Part-B
			End Exam	End Exam	End Exam
1.	Architecture in Colonial India	12	18	1	2
2.	Post-Nehruvian modernist architecture	8	10	1	1
3.	Understanding the Contemporary trends in India.	12	18	1	2
4.	Post independent architecture	10	10	1	1
5.	Works of contemporary architects	12	18	1	2
Total:		54	74	5	8

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above
2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

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

COURSE LEARNING OBJECTIVES:

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

COURSE OUTCOMES: At the end of the course, the student will be able to

CO1	Students will develop an understanding of the principles of contemporary architecture, including the use of new materials, technologies, and sustainability.
CO2	Students will analyze and critique contemporary architectural works, and how they are influenced by social, cultural, economic, and political factors. including the work of famous architects and emerging talents
CO3	Students will learn to use architectural vocabulary, tools, and techniques to communicate their ideas effectively in writing, drawing, and modeling.
CO4	Students will develop critical thinking and problem-solving skills by examining complex design problems and proposing creative and innovative solutions.
CO5	Students will be able to apply their knowledge of contemporary architecture to real-world design problems and develop design proposals that are innovative, practical, and sustainable.

COURSE CONTENTS:

Unit I

Architecture in colonial India: 1)Early colonial period – Examples – (Eg.) St. Paul's Cathedral, Calcutta. 2)Architectural character of Indo-Saracenic and Classical revival (Eg)–University of Madras Senate House & Rippon Building, Central railway station Chennai. 3) Later Colonial period – Contribution of Edwin Lutyens & Herbert Baker to the lay-out and Architecture of New Delhi (Eg.) Rashtrapathi Bhavan & Parliament House.

Unit II

Post-Nehruvian modernist architecture: 1)Criticisms on the modern movement in India, countering the stigma of colonialism.2) The neovernacular, the community architectural movement. 3)Integrating the new and the old, revivalism and post-modernism.4) Theory of post modernism.

Unit III

Understanding of Contemporary trends in architecture in India Trends in architecture of India 1)Le Corbusier' works in India – Chandigarh and the Ahmadabad buildings - their influence on the modern rationalists.2) Louis Kahn's works in India - their influence on the empiricists. 3)Familiarization with the works of architecture at Auroville.4) Works of Laurie Baker.

Unit IV

Post independent architecture: Influences by post-independence Architects- 1) Architecture of Charles Corea-(Eg) British council Library Delhi, Kanchenjunga Apartments, Mumbai.2) Achuyut Kanvinde – (Eg)-IIT, Kanpur, Nehru science center, Mumbai.3) Anant Raje-(Eg) Bhopal Development Authority Headquarters, Institute for Forest Management, Bhopal.4) B.V. Doshi – (Eg)Sangath Office, Ahmedabad, IIM Bangalore.5) Raj Rewal – Pragati Maidan New Delhi, Asian Games village, New Delhi. 6) UttamC jain – (Eg)University of Jodhpur, Jodhpur, Neelam Cinema Theatre, Sanchore.7) Hasmukh C Patel's - Entrepreneurship Development Institute of India, Gandhinagar, Sabarmati River Front Development, Ahmedabad.

Unit V

Works of contemporary architects: 1)Architects and their ideologies and philosophies towards architecture – 1) Sanjay Mohe (Eg) – Lecturer hall block, IIM Bangalore, Karunashraya, Bangalore.2) Sanjay Puri- Mosaic hotel, Delhi CIE, Cochin CNT - Tata Dhan Academy, Madurai, Dr. Reddy's laboratory, Hyderabad.3) Morphogenesis- Pearl Academy of Fashion, Jaipur, PVR, Bangalore.4) Jaisim –C R Simha, Bangalore, IIPM, Bangalore, Bhooshan – Le olive Garden, The village, Mysore..

COURSREFERENCE 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's.

COURSE OUTCOMES VS PO_S AND PSO_SMAPPING:

Course Out Comes : AR 322 (C16)	Program Outcomes Pos												Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	1	3	3	2						2	1	-	3
CO2	3	2	1	2	2	3	1	2				3	1	1	-	3
CO3	2	3	1	2	1	2	3		3		1		2	1	-	3
CO4	1	1	2	1	2	3	1	3			1		1	1	-	3
CO5	2	3	2	3	1	2	1			3		2	1	1	-	3
Total	09	12	09	10	09	13	08	05	-		02	05	07	05	-	15

AR 323(C16) : DESIGN OF STEEL STRUCTURES

Periods / Week :4
Periods / Semester :72
Credits :4
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Exam)

TIME SCHEDULE

S.No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I - Introduction- Structural steel	10	10	1	1
2.	Unit–II - compression members	10	8	-	1
3.	Unit– III - Flexural members	10	8	-	1
4.	Unit–IV - Column Splices	8	12	2	1
5.	Unit–V - Sllab base and gusseted base	12	16	-	2
6.	Unit–VI - Grillage foundation	10	10	1	1
7	Unit-VII - Purlins	12	10	1	1
	Total:	**72**	**74**	**5**	**8**

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions, all 5 to answer, no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE LEARNING OBJECTIVES:

- To understand the fundamentals and design principles of steel structures.
- To understand the importance and failure methods of joints in steel structures.
- To be able to design the flexural elements in steel structures.
- To gain knowledge in calculating built-up sectional areas for built-up members and designing them for maximum efficiency
- To understand the Principles detailing steel structures.
- To provide students with the skills and knowledge needed to design, detail and execute the construction of a steel building.

COURSEOUTCOMES: At the end of the course, the student will be able to

CO1	To demonstrate a comprehensive understanding of the fundamentals of steel structures and their importance.
CO2	To understand the principle of design for compression members.
CO3	To evaluate different types of support conditions and failure modes in flexural members and design the flexural member.
CO4	To understand and apply the specific guidelines given in the code for connecting two elements.
CO5	To design and show the detailing of base plates and slabs in the design of steel structure.

UNIT I

Introduction - Steel Structures : (i) Introduction; (ii) Definition , (a) Scope of Steel Structures , (b) Structural steel, (c) Products of structural steel, (d) Standards; (iii) Codes and Specifications, (a) Fatigue, (b) Brittle fracture, (c) Corrosion protection of steel structures; (iv) Design philosophies; (v) Methods of structural analysis, (a) Plate (Local) buckling; (vi) Classification of sections **(**vii) Structural steel fasteners, (a) Introduction, (b) Welding, (c) Bolting; **(**viii) Tension members, (a) Introduction, (b)Net area, (c)Shear-lag, (d) Design of tension members.

UNIT II

Compression Members: (i) Compression members, (ii) Introduction; (iii) Euler's buckling theory, (a) Behavior of real columns, (b) Types of sections; (iv) Design of columns, (a)Validity of design strength calculations; (v) Design of compression members, (a) Design Procedure; (vi) Built-up compression members

UNIT III

Flexural Members : (i) Beams Introduction ; (ii) Flexural behavior of beams which does not undergo lateral buckling; (iii) Flexural behavior of beams which undergo lateral buckling; (iv)

Shear behavior; (v) Web buckling and Crippling; (vi) Design strength in bending; (vii) Design strength in shear, (a) Limit state serviceability – Deflection

UNIT IV

Column Splice: (i) Beam-columns, (a) Introduction; (ii) Analysis of beam-columns; (iii) Modes of failure, (a) Design specifications; (iv) Column Splices and Bases, (a) Introduction, (b) Column splices, (c) Column bases.

Unit V

Slab Base and Gusseted Base: (i) Design of slab base and gusseted base for axial loads (without moments) for different columns.

Unit VI

Grillage Foundation: (i) Design of grillage foundation for isolated columns only

Unit VII

Purlins : (i) Purlins; (ii) Introduction, (a) Dead load, live load and wind loads;

(iii) Design of angle purlin and 'I'-section Purlins.

REFERENCE BOOKS:

1) **Ram Chandra**.Design of Steel Structures Vol. I, 10th ed. Standard Book House, Delhi, 1999.
2) **Dayaratnam, P.** Design of Steel Structures. Wheeler Pub., Allahabad, 1992.
3) **Ramamrutham, S. and Narayanan, R.** Design of Steel Structures, 4th ed. Dhanpat Rai and Sons, Delhi, 1995.

COURSE OUTCOMES VS PO_S AND PSO_SMAPPING:

Course Out Comes : AR323(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	-	-	1	-	-	1	1	1	2	1	1	1	1	1
CO2	1	-	4	-	-	-	-	1	3	-	1	2	2	1	1	1	1
CO3	1	2	4	-	-	-	-	1	3	-	1	2	2	1	1	1	1
CO4	1	-	4	-	-	-	-	1	3	-	1	2	2	1	1	1	1
CO5	1	3	1	-	-	1	-	-	1	1	1	2	1	1	1	1	1
Total	5	7	14	0	0	2	0	3	11	2	5	10	8	5	5	5	5

AR 324(C16) : ARCHITECTURAL ACOUSTICS

Periods / Week :3
Periods / Semester :54
Credits :3
Internal Assignments & Mid exams :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam : 3Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I Fundamentals of Acoustics	6	10	-	1
2.	Unit – II Sound Absorption	9	8	1	1
3.	Unit – III Acoustics of enclosed spaces	9	10	1	2
4.	Unit – IV Noise Control	9	16	1	1
5.	Unit – V Acoustics In Building Design And Construction	9	10	-	1
6.	Unit – VI Speech Privacy	6	10	1	1
7.	Unit – VII Electronic Sound Systems	6	10	1	1
Total:		54	74	5	8

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

Providing knowledge on Acoustics as a determinant of built form with emphasis on the application to architecture.; intended to provide brief background knowledge about the architectural acoustics in practice for various building types.

COURSE LEARNING OBJECTIVES:

- To provide knowledge on acoustics as a determinant of built form with emphasis on the application to architecture.
- To intend to provide brief background knowledge about the architectural acoustics in practice for various building types.
- To analyze various aspects related to acoustic systems and understand the techniques involved in acoustic design.
- To emphasize the importance of materials and construction techniques required for acoustical treatment of buildings.
- To undertake the study of architectural acoustics and its comparison in different buildings.
- At the end of the course the students will be able to grab the knowledge of specific acoustic requirements of different spaces, and learn the skills to deal with acoustic problems within buildings.

COURSE OUTCOMES

CO 1	Learning about the fundamentals of acoustics and its pioneers, relate building science with the science of hearing and basics of sound as a medium.
CO 2	Analyze the theory of sound, relate it to the building design and human needs, design according to scale factor and diverse needs of people, writing down clear notes about scale factor and challenges in design.
CO 3	Evaluating the factors of acoustical design in architecture merging with the space, considerations taken at site level and structural systems, case study and understanding of an example related to architectural design.
CO 4	Analysis of sources and types of noise- in and around buildings characteristics and effect of noise impact on human beings/ behavior, effect of it on the environment and urban design and its impact on people and wellbeing.
CO 5	Understanding the techniques of construction using different materials and application on buildings, using different techniques and mathematical calculation using formulas and structural analysis to interpret in design, making an effective report to evaluate acoustical design.

CO6	Learning about the characteristics of speech and audibility intelligence of sound, distribution of energy in speech and music frequencies, application of the same knowledge in architectural design.
CO7	Understanding how noise control can be done in buildings through effective use of building materials and construction techniques, applications and limitations of the same in architectural design.

COURSE CONTENTS:

Unit I

Fundamentals of Acoustics: (i)Need to study acoustics. (ii) pioneers and their works. (iii) Acoustics examples from the past: (a) methods used for good acoustics. (iv) Physiology of hearing and psychoacoustics- (a)Human ear,(b)Loudness perception, (c) subjective effects, (d) characteristics of sound in speech and music, (e) A-weighted sound levels.

Unit II

Sound Absorption: (i) Theory of sound: (a)generation, (b)propagation, (c)transmission, (d)reception of sound, (e)sound waves, (f)frequency, (g)intensity, (h)wavelength, (i)sound (j)pressure, (k)measurement of sound, (l) scales- decibel scale. (ii) Sound absorption: (a)absorption co-efficient and their measurements, (iii) Absorbing materials used and their choices, (iv) exercises involving reverberation time and absorption co-efficient. (v) Sound insulation and materials.

Unit III

Acoustics Of Enclosed Spaces - (i)Room Acoustics - (a)shaping of room enclosures (b) the selection and distribution of construction assemblies (c) finish materials to enhance the loudness, richness and natural tonal qualities of voices or musical instruments. (ii) (a)Ray-diagrams, (b)sound paths, (c)effect of geometry and shapes, (d)sound adsorption, (e)sound absorption coefficients, (f)Sabine's formula, and resonant panels. (iii) Acoustic design process and different types of buildings: (a)Auditoriums, (b)concert halls, (c)cinema halls, (d)Seminar rooms, (e) lecture halls, (f)class rooms and open offices.

(iv) Case study of an auditorium with a report containing drawings and calculations of reverberation time etc. (v)Detailed acoustic design for any one type of building.

Unit IV

Noise Control : (i) Sources and types of noise- in and around buildings: (a)characteristics and effect of noise impact on human beings/ behavior,(b) noise curves,(c) transmission of noise, (ii) noise control for buildings- (a) laws and legislation, (b) regulations. (iii) Sound amplification and distribution: (a)sound reinforcement of different rooms. (iv) Environmental acoustics- legislature – related to (a) transportation, examples- airports, railway stations, railway tracks, MRTS etc. (v)

Design of room enclosure systems, (vi) selection of construction assemblies and detailing of building systems such as HVAC to prevent the spread of unwanted sounds throughout the building.

Unit V

Acoustics In Building Design And Construction : (i) Design: (a) Site selection, (b)shape, (c) volume, (d) treatment for interior surface, (e) basic principles in designing open air theatres, cinemas, broadcasting studios. (ii) Constructional detailing, relation to (a) walls (b)partition, (c) floor (d) ceiling (e) opening (f) windows (g) doors. (iii) Insulating fittings and gadgets machine mounting and installation of machinery.

Unit VI

Speech Privacy: (i) Characteristics of speech: (a) Characteristics of speech, (b) music and hearing (ii) distribution of energy in speech and music frequencies, (iii) intelligibility of speech, (iv) high fidelity reproduction of music.

Unit VII

Electronic Sound Systems - (i) electronic sound reinforcement or amplification to enhance the listening experience of speech, music or media program. (ii) Noise Control - (a) creating noise to actively cancel noise, (b) applications and limitations.

Assignments

for each unit to be submitted for scheduled date. (ii) Students shall make a report and presentation on study of architectural acoustics and **Internal Submission shall include:**

(i) Written its comparison in different buildings. (iii) A case study on materials and structure in terms of acoustics to be submitted in report. (iv) The course shall include acoustic proposals in the major architectural design problem.

REFERENCE BOOKS:

1) **An introduction to Building Physics**- Kabeer printing works, Chennai -5 Dr.V. Narasimhan S.L.Suri.
2) **Acoustics Design and Practice**, Asia Publishing House, New York, 1963
3) **Detailing for architectural acoustics** - Peter Templeton & Saunders. Architectural press, 1994
4. Acoustical design of auditoriums- IS2526 –ISI –1963.
4) **Elements of acoustics** – John Wiley & sons, 1975
5) 6.**Heat pumps and Electric Heating,** E.R. Ambrose, John and Wiley and Sons Inc, New York, 1968.
6) 7.**Environmental Acoustics,** Poella. L. Lestie.
7) 8. **Design of Good Acoustics,** Moore, J.E, The Architectural press, London, 1961.
8) 9.**Acoustics for the Architect,** Burris, Harlod
9) 10. **The Architecture of Sound**: Lord, Peter and Templetion, Duncan.
10) 11. **Architectural Acoustics,** Egan, David, MC Graw-Hill Book company, New York, 1988.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR324(C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	1	2	-	-	1	1	1	1	1	3
CO2	3	3	3	2	2	-	1	-	1	1	-	1	2	-	-	-	3
CO3	2	3	2	2	2	1	1	1	1	1	1	1	2	-	1	1	3
CO4	2	2	2	2	2	1	1	-	1	1	1	1	1	1	-	-	3
CO5	2	3	2	2	1	2	1	1	-	2	-	1	1	1	-	1	3
CO7	2	3	2	1	2	-	-	-	-	2	-	1	1	1	1	1	1
Total	14	17	14	10	09	05	06	02	03	02	02	-	02	03	02	03	15

AR 325(C16) : ENVIRONMENTAL STUDIES

Periods / Week : 3
Periods / Semester : 54
Credits : 2
Internal Assignments & Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Environmental studies – Introduction	3	10	1	1
2	Environmental and Natural Resources	9	10	1	1
3	Basic Principles of Ecosystems Functioning	6	10	1	1
4	Biodiversity and its conservation	6	10	1	1
5	Environmental Pollution	6	10	1	1
6	Social Issues and the Environment:	9	08		1
7	The Environment Impact Assessment	6	08		1
8	Field work	9	08		1
Total:		**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above
2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

. A compulsory subject for all the undergraduate students of various discipline highlights significance of maintaining balance and sustainability of various components of the environment.

COURSE LEARNING OBJECTIVES:

- To reintroduce the topic after primary education and understand its need, importance of environment in today's world.
- To sensitize the students towards sustainable environment.
- Analyze the interrelationship between living organism and environment.
- Understand the importance of environment by assessing its impact on the human world.
- Enrich the knowledge on themes of biodiversity, natural resources, pollution control and waste management. Understand the constitutional protection given for environment.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	define and understand the scope and importance of Environmental Studies as an interdisciplinary field that involves the study of natural and human-made environments, their interactions, and their impact on human health and well-being. identify and apply various environmental development indicators used to measure the progress of sustainable development like biodiversity, ecosystem health, greenhouse gas emissions, water quality, and others. develop and propose sustainable solutions to environmental problems and challenges, using interdisciplinary approaches that consider economic, social, and environmental factors.
CO 2	Understand the concept of renewable and non-renewable resources. Identify the natural resources and associated problems such as depletion, degradation, and pollution.
CO 3	Identify the structure and function of an ecosystem and learn the roles of producers, consumers, and decomposers, energy flow, ecological succession and characteristics of in different types of ecosystem.
CO 4	Understand the concept of biodiversity and its importance, Learn about India's status as a mega-diversity nation, Develop an understanding of conservation strategies for biodiversity.

CO 5	Understand the definition, causes, effects, and control measures of various types of pollution. causes, effects, and control measures of urban and industrial solid waste, as well as the role of individuals in preventing pollution. Understand disaster management strategies for floods, earthquakes, cyclones, and landslides, and their impacts on the environment and human health.
CO 6	Understand the concept of sustainable development and identify the challenges faced in achieving it. analyze urban problems related to energy and identify solutions. explore water conservation methods, including rainwater harvesting and watershed management. Understand the provisions of the Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, and Forest Conservation Act.
CO 7	Definition, significance and framework, Methodologies-checklist, components EIA, EIA developing countries, Social cost benefit analysis, Sources and acquisition of environmental information and be able to analyze and evaluate the effectiveness of EIA in different contexts.
CO 8	Acquire knowledge of how all the animals are competing with their food requirements and also understand the various trophic levels in the food chain. Acquire the genetic diversity, species and ecosystem diversity through various cases.

COURSE CONTENTS

Unit I

Environmental studies – Introduction: -1).Definition, scope and importance, Measuring and defining environmental development indicators.

Unit II

Environmental and Natural Resources:1.) Renewable and non-renewable resources - Natural resources and associated problems - Forest resources - Use and over - exploitation, deforestation,case studies - Timber extraction – **2**).Mining, dams and other effects on forest and tribal people -Water resources - Use and over utilization of surface and ground water - Floods, drought, conflicts over water, dams - benefits and problems -3). Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies

Unit III

Basic Principles of Ecosystems Functioning: 1). Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in theecosystem Ecological succession. - Food chains, food webs and ecological pyramids. **.2**). - Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Unit IV

Biodiversity and its conservation: 1). Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values of *Biodiversity* at global, National and local levels… . **2).** India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemicspecies of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit V

Environmental Pollution: 1). Definition, Cause, effects and control measures of: A.) Air pollution B).Water pollution ,C). Soil pollution D). Marine pollution E) Noise pollution F) Thermal pollution G).Nuclear hazards

2). Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

Unit VI

Social Issues and the Environment: **1**).From unsustainable to sustainable development - Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns..**2**) Case Studies -Environmental ethics: Issues and possible solutions. Climate change, global warming,

id rain, ozone layer depletion, nuclear accidents and holocaust. **3).**Case Studies. - Wasteland reclamation. -Consumerism and waste products. -Air (Prevention and Control of Pollution) Act.

-Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest ConservationAct -Issues involved in enforcement of environmental legislation. -Public awareness

Unit VII

EIA (Environmental Impact Assessment):1) Definition, significance and framework, Methodologies-checklist, components EIA, EIA developing countries, Social cost benefit analysis, Sources and acquisition of environmental information, **2**) Environmental land use classification, EIA studies of development projects, advantages and disadvantages of EIA.

Unit – VIII:

Field work: **1**). Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems pond, river, hill slopes, etc

COURSREFERENCE BOOKS:

1) **Erach Bharucha,** A Text Book of Environmental Studies for Undergraduate
2) Courses, University Grants Commission.
3) P.D. Sharma, Ecology and Environment.
4) N.S. Subramanian and A.V.S.S. Sambamurty, Ecology.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR 325 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	3	3	2	3	2	3	3	2	2	3	1	3	3	1	3	3
CO2	2	3	1	3	3	1	3	3	2	1	3	1	3	3	1	3	3
CO3	1	2	1	2	3	2	2	3	2	1	1	1	3	3	1	3	3
CO4	1	3	1	3	3	2	2	3	1	1	2	1	3	3	1	3	3
CO5	3	3	2	3	3	2	3	3	2	2	2	2	2	3	2	3	3
CO6	3	3	3	3	3	2	2	3	1	2	3	2	3	3	2	3	3
CO7	2	3	2	3	3	2	2	3	2	2	2	1	3	3	2	3	3
CO8	1	3	2	3	3	1	2	3	1	1	1	1	3	3	1	3	3
Total	15	23	15	22	24	14	19	24	13	12	17	10	23	24	11	24	24

AR 326(C16) : WORKING DRAWINGS AND DETAILS

Periods / Week : **06**
Periods / Semester : **108**
Credits : **06**
Internal Assignments & Mid's : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **Viva-Voice**

TIME SCHEDULE

S.No.	Major Topics	No. of periods	Weightage of marks	No of short ans. questions	No of essay ans. questions
1.	Unit – I Preparation of plans, sections and elevations	18	15	-	-
2.	Unit – II Preparing of marking plan,centre-line plan,	18	8	-	-
3.	Unit – III Details of elevation and section	12	5	-	-
4.	Mid-1	3	25	-	-
5.	Unit – IV Sanitary and electrical layout	12	10	-	-
6.	Unit – V Architectural elements	12	4	-	-
7.	Unit –VI Detailing of doors and windows	12	4	-	-
8.	Unit – VII Barrier free environment	6	4	-	-
9.	Mid-2	3	25	-	-
	Total:	**108**	**50**	-	-

COURSE OVERVIEW:

The focus of the course is to impart skills related to the preparation of drawings meant for construction work on the site and to improve the student's ability of detailing.

COURSE LEARNING OBJECTIVES:

- To impart training in the preparation of working drawings for buildings with specific reference to code of practice as per IS Code No. 962 of 1969 and incorporating specifications as complementary to the working drawings.
- To sensitize the students in preparing finer design details required for buildings.

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COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Ability to create accurate technical drawings that depict objects or structures using various drawing techniques
CO 2	Understand the principles and conventions of technical drawings, line types, scales, annotation and apply in drawings
CO 3	To create assembly and details drawings, material specification and various lists
CO 4	To design the services drawings of the designed structure.
CO 5	To develop the internal details through technical drawings of the buildings.
CO6	To design the Miscellaneous drawings and schedule of openings
CO7	To create and develop the barrier free designs through drawings

COURSE CONTENTS:

Unit I

Preparation of working drawings: Suitable scales of drawings, methods of giving dimensions: on plans, sections, elevations and other standards.

Unit II

Preparation of Plans Building marking plan, centerline plan, foundation plan, column centerlinesdrawings, floor plans, terrace floor plan.

Unit III

Elevation and Sections - Detailed elevations, detailed sections – at least one through staircase and onethrough toilet, typical wall profile sections and elevations.

Unit IV

Details - Layout for Sanitation: and detailed plans, Electrical layout: plans and details, details ofstaircases, toilets and kitchens.

Unit IV

Detailing for walls, floors, ceilings through detail drawings to large scale in the form of plans, sections,elevations. Surface Treatment; Cladding, texture treatment.

Unit V

Detailing of architectural elements such as staircase, balcony, verandah, shading devices vertical andhorizontal components of the building.

Unit VI

Detailing of Doors, windows, storage shelves for frames, shutters, joinery of frame to shutter, shutter topanelling etc. and other fixing details.

Unit VII

Design details appropriate for creating Barrier Free Environment.

*Note: - Students shall prepare at least two working drawing sets, one for a small residence and one for alarge building.

COURSREFERENCE BOOKS:

1) **Lerrs, Jack.** Engineering Construction Specification.
2) **Liebing, W. Ralph and Raul, Ford Mimi.** Architectural Working Drawings, 2nd ed. John Wiley andSons, New York, 1983.
3) **Macey, W. Frank.** Specification in Detail, 5th ed. Technical Press ltd, London, 1955.
4) **Shah, M.G., and Others.** Building Drawing: with an integrated approach to build environment, 3rd ed.Tata McGraw Hill Pub., co. Ltd, New Delhi,1996.
5) **Standard Specification of Government of Andhra Pradesh State.**
6) **Lewis, R. Jack.** Building Construction Specifications. Prentice-Hall, Inc., New Jersey, 1975.
7) **Govt. of Maharashtra.** Standard Specifications, Government Press, Nagpur, 1972.
8) **Datta, B.N.** Estimating and Costing in Civil Engineering: Theory and Practice, 23rd ed. UBS Pub. NewDelhi, 1993.
9) **Wakita, Osamu A. & Linde, Richard M.** The professional practice of architectural detailing, 2nd ed.New York: Wiley, 1987.
10) **Robert, C. Mc Hugh.** Working Drawing Hand Book, New York: VNR, 1977.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR 326 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	1	3	3	1	3	2	2	3	3	3	2	1	1
CO2	2	3	3	2	1	3	3	-	3	1	-	3	3	3	2	1	1
CO3	3	3	2	3	1	3	3	-	3	1	-	3	3	1	2	-	1
CO4	3	3	2	2	1	3	3	2	3	1	2	3	3	2	2	-	1
CO5	2	3	2	2	3	3	2	2	3	1	1	3	3	2	3	-	1
CO6	3	3	2	2	1	3	3	-	3	1	-	3	3	2	2	1	1
CO7	3	3	2	3	1	3	3	1	3	2	1	3	3	3	3	1	1
Total	19	21	15	17	09	21	20	06	21	09	06	21	21	19	16	04	07

AR 327(C16) : ARCHITECTURAL DESIGN-V

Studio/Drawing Periods/Week : 9
Studio/Drawing Periods/Semester : 162
Credits : 9
Internal Assignments :200 Marks
External Examinations :200 Marks
Total Marks :400 Marks
External Jury : Viva Voce

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Internal Marks	Weightage of External Marks	Viva voce
			Internal review	External jury	External jury
1.	Unit – I Design for passive recreation	50	70	75	75
2.	Unit – II Design for large span buildings for public use	66	70	75	75
3.	Unit – III Design of multi-purpose gathering spaces	46	40	50	50
4.	Attendance		20		
	Total:	**162**	**200**	**200**	**200**

Note: (a) For assessment:

1) 1.From all the units as a whole - At least three design problems should be given for the semester, one design problem from each unit.
2) 2.Sufficient theoretical inputs need to be given highlighting the norms and standards of design parameters.
3) Overall internal submission should have two major designs and one minor design.
4) The final Design proposal submission shall necessarily include digital model/walkthrough/ a scaled model for one of the major designs.
5) The students must submit the entire portfolio of three designs for the final internal submission after which they can attend the external end exam.

6) In the end exam which is viva voce, the students are required to present the entire semester work.

COURSE OVERVIEW:

This course is intended to provide skills for designing a multiple use, large span and multi storey buildings with the requirement provided and also aims at teaching the design of buildings in terms of passive recreation for public uses.

COURSE LEARNING OBJECTIVES:

- To understand Design vocabulary, enhancement and sensitization in design preparation and its relation to structural systems.
- To Design exercises that explore Architecture as responding to various aspects such as contextual, social, economic, cultural and political issues.
- To develop the design according to the user requirements with implementing innovation and aesthetics.
- To design, keeping in mind the standard norms followed for each type of building.

1) At the end of the course work, the students would be able to understand about the importance of designing with norms and trying to solve various design issues.
2) The students will develop knowledge of the preparation of drawings for various building typologies.
3) Learning and understanding the design response to various trends in architecture.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To develop the design according to the user requirements with implementing function, innovation and aesthetics.
CO 2	Analyze the different methods and procedures used in practical development of design to attain solutions to simple and complex design problems.
CO 3	Design, exercises that explore Architecture as responding to various aspects such as contextual, social, economic, cultural and Standards issues.
CO 4	Learning and understanding the design response to various aspects like climate, Building services, barrier-free environment in architecture.
CO 5	To design and present the technical requirements of design using software tools for drawing representation.
CO 6	Study of the physical, socio economic and cultural aspects of a selected place to Understand the settlement pattern and amenities that are existing or required.

COURSE CONTENTS:

Unit I

Design for passive recreation (i) as response to the context of a place along with exploration of design solutions at the level of site and building.(ii) Study of the physical, socio economic and cultural aspects of a selected place to understand the settlement pattern and amenities that are existing or required. (iii) The Design exercise shall include the facility required such as

- Infotainment center.
- Convention Centre.
- Cultural Centre.

The minimum no. of drawings to be submitted for the design shall include: (i) conceptual drawings (ii) Site plan & two site sections,(iii) detailed floor plans,(iv) Two sections; one cut through vertical circulation,(v)Two Elevations (6) one view

Unit II

Design for large span buildings for public use – (i) Studying the function, circulation and zoning Study under various circumstances and its transformation due to (a) location, (b) size, (c) material (d)construction. (ii) To analyze parking spaces, (iii) driveways,(iv) corridors, (v) lobbies, (vi) building services that can be designed to foster public use – (v) The design exercise shall include the facility required such as

- Bus terminals.
- Multiplex.
- Auditorium Complex.

The minimum no. of drawings to be submitted for the design shall include: (i) conceptual drawings (ii) Site plan & two site sections,(iii) detailed floor plans,(iv) Two sections; one cut through vertical circulation,(v)Two Elevations (vi) one view

Unit III

Design of multi-purpose gathering spaces – (i) Study of socio-economic culture aspects & their manifestations, architectural expressions. (ii) To understand the linkages between Occupants and building. (iii) Design exercise may include the facility required such as

- kalyanamandapam
- Civic Centre
- Community Centre.

The minimum no. of drawings to be submitted for the design shall include: (i) conceptual drawings (ii) Site plan & two site sections,(iii) detailed floor plans,(iv) Two sections; one cut through vertical circulation,(v)Two Elevations (vi) one view

Design issues of all the major and minor designs should address the following:

- User behavior and requirements.
- Utility and space enhancement.
- Form and function.
- Circulation: horizontal and vertical.
- Site Planning and Landscape detailing.
- Structural details such as beam framing and Building Services
- Design detailing considering the barrier free environment.
- Socio-economic profile of user group.
- Parking details and standards for large scale designs.

INTERNAL SUBMISSION:

i) Drawings of each design to be submitted manually or digital with the required parameters.
ii) Each design problem to be submitted in the given format.
iii) All the designs should have literature, case studies and comparative analysis before the final design is done.
iv) Each design should be made as a portfolio.

COURSREFERENCE BOOKS:

1) Chiara Joseph de and Others. Time Savers Standards of Building Types. McGraw – Hill, 1980.
2) Dawes, John. Design and Planning for Swimming Pools. The Architectural Press, London, 1979.
3) Ruknitein, M. Harvey. Central City Malls.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR327(C16)	Program Outcomes Po's													Program-Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	1	1	1	1	1	1	-	1	2	1	1	1	-	-
CO2	1	1	3	1	-	3	1	1	1	-	1	1	1	1	3	1	1
CO3	-	2	-	1	3	-	2	2	1	-	1	-	-	3	-	-	2
CO4	2	1	-	1	1	1	1	-	-	-	1	2	-	1	2	-	1
CO5	1	1	-	3	1	3	-	1	-	-	1	1	-	1	-	1	1
CO6	-	1	-	1	3	-	3	1	-	-	1	1	1	2	-	-	2
Total	06	08	04	08	09	08	08	06	03	-	06	07	03	09	06	02	07

AR 411(C16) : URBAN DESIGN THEORY

Periods / Week	**:**	**3**
Periods / Semester	**:**	**54**
Credits	**:**	**3**
Internal Assignments & Mids	**:**	**50 Marks**
External Examinations	**:**	**50 Marks**
Total Marks	**:**	**100 Marks**
Duration of Exam	**:**	**3 Hrs (University Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit-I. Introduction to Urban Design	8	10	1	1
2	Unit-II. Elements of Urban Design	12	18	1	2
3	Unit-III. Typologies and Procedures	14	18	1	2
4	Unit-IV. Urban Design and Sustainability	10	10	1	1
5	Unit-V. Urban Design Implementation	10	18	1	2
TOTAL		**54**	**74**	**5**	8

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above
2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course focuses on creating awareness in the term Urban, its importance in the modern context and understanding of interrelation between growth, development, architecture, planning and how its different at micro and macro levels. It focuses on Understanding the terms Urbanization, Socio Economic conditions, need for Urban Infrastructure as a part key players in any Urban development.

COURSE LEARNING OBJECTIVES:

- To introduce Urban design as a professional discipline and acts as interface between architecture, landscape and urban planning .
- To sensitize the students about the concept of public realm, understanding of the city as a three dimensional entity and perception of spacesat multiple scales.
- To familiarize with the implementation processes through various statutory and non-statutory guidelines for planning & development .
- To provide an understanding of Planning & Design development theories and the historical circumstances in which they evolved.
- To bridge the historical path of urbanization as a process and examines the spatial correspondence between urban patterns through space and time and connected development paradigms focusing on pre-industrial settlements and urban centre's.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Classify the Context and apply the knowledge on the disciplines of Architecture and Urban. Explain the origin & Fundamentals of Urban Design its principles and Theories and interpret the subjects Urban forms and spaces at various spatial scales.
CO 2	Interpret The elements of Design in basic and at Urban Scale Design , Organize and articulate of Design Elements. Identify and proceed on the concepts of Public and Open Spaces, Image of the City Identify Street Scape's , Urban Square, City Centers, Promenades.
CO 3	Differentiate and Act on Public and Private Spaces Judge what type of Design Intervention is required. Do Advocacy Planning and inclusive Design in both Democratic and Authoritarian Situations. Identify and Redesign , Redevelop and Revitalize of the Case.
CO 4	Understand concept of Sustainability and importance and Need and Apply in his work. Understand the disciplines Economics, Environmental, Social and implement in the

	design. Design the cities in compact , healthy and walk able with development along the transportation Corridor.
CO 5	Understand the scope and limitations, Institutional arrangements and procedures and execute. Gain Complete knowledge on the Instruments of Planning, various types of plans and Zoning Guideline to design an efficient and sustainable City

COURSE CONTENTS

Unit I

Introduction to Urban Design

Relationship between Architecture, landscape, Urban Design and Urban Planning; Brief review of the evolution of the urban design as a discipline, basic principles and theories. Broad understanding of urban forms and spaces at various spatial scales through examples from historic cities.

Unit II

Elements of Urban Design

Understanding the city as a three dimensional element; Urban form as determined by interplay of masses, voids, order, scale, harmony, symmetry, color and texture; Organization of spaces and their articulation in the form of squares, streets, vistas and focal points; Concept of public and open space; Image of the city and its components such as edges, paths, landmarks, street features.

Unit III

Typologies and Procedures

Concepts of public and private realm; understanding different types and procedures of urban design interventions, their scale; relationships; constraints and challenges of urban design in democratic versus authoritarian settings. Concepts of Urban Re-design, Urban Renewal, Urban Redevelop and Urban Revitalization.

Unit IV

Urban Design and Sustainability

Sustainability concept; Relationship of urban design with economic, environmental and social sustainability; Urban renewal and urban sprawl; Concepts of Transit Oriented Development, Compact City, Healthy City and Walk able City.

Unit V

Urban Design Implementation

Urban design and its control; Institutional arrangements for design and planning, their roles, powers and limitations; Types of planning instruments, structure plans, master plans and local area plans and zoning guidelines; Design communication and role of public participation;_ Studio component of the semester may be integrated with Architectural Design of the current semester.

REFERENCES BOOKS:

1) Larice, M. and Macdonald, E. Ed. (2013). The Urban Design Reader. 2nd Ed. The Routledge Urban
2) Reader Series, Abingdon, Oxon : Routledge.
3) Carmona, M., Heath, T., Oc, T. and Tiesdell, S. (2010). Public Places Urban Spaces. Oxford : Architectural Press.
4) Marshall, S. (2009). Cities design and evolution. New York : Routledge.
5) Lang, J. T. (2005). Urban Design: A Typology of Procedures and Products. Oxford :
6) Elsevier/Architectural Press.
7) Moughtin, C., Cuesta, R., Sarris, C. and Signoretta, P. (2003). Urban Design - Methods and
8) Techniques. Oxford : Architectural Press.
9) Watson, D., Plattus, A. and Shibley, R. (2003). Time-Saver standards for urban design. New York : McGraw Hill.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR 411(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
Total	15	15	15	15	15	10	15	15	15	15	15	15	15	15	15	15	15

AR 412(C16) : HUMAN SETTLEMENTS AND TOWN PLANNING

Periods / Week : 4
Periods / Semester : 72
Credits : 4
Internal Assignments & Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit-I. Evolution of Human Settlements, Its Importance & Types, and Growth of Human settlements through Historical Periods	12	18	1	2
2	Unit-II. Human settlements and Their Characteristics and Political expression	16	10	1	1
3	Unit-III. Human Settlements in Changing World	16	10	1	1
4	Unit-IV. Principles of Town planning, Necessity, Origin & Growth of Town Planning, Land use & Forms, Town Planning Schemes & Factors to be considered in planning a town.	14	18	1	2
5	Unit-V. Town Planning Surveys Data collection - Zoning, Housing, Residential buildings, Slums Recreation Areas, Industries, Public buildings, Building bye laws ,Development plan and Master plan, Urban Roads	14	18	1	2
	Total	**54**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above
2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course focuses on the Detailed review of Origin of Human Settlements and Town planning , its determinants and their evolution through the Course of History from different parts of the world in different periods and Town planning and settlement patterns of ancient towns in India.

COURSE LEARNING OBJECTIVES:

- To understand the concept of human settlements and their patterns form past to present scenario.
- To understand the sociological aspects of the then settlements and their influence
- To understand the importance of basic shelter and elements in the settlement.
- To understand the concept of town planning form the history to today'srapidly being urbanized and highly populated towns and cities.
- To study the characteristics of human settlements and manifestation of settlements as expression of Politicalaspirations.
- To Understand the Changing scenario in the concept of Globalization.
- To understand the evolution of planning its objectives and need, Types of towns .
- To make the students Familiar with various tools of gathering the urban data.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Learn how the formation of basic settlements happen Factors or determinants that affect in the formation o f settlements & architecture of the region. Learn about sociological aspects and characteristics of both Rural and Urban Settlements and Patters in India

CO 2	Understand The Settlements of Various Parts of the world Gain Knowledge by understanding the contributions of Various pioneers of Planning
CO 3	Learn the role played by trade commerce and Information Understand how the Transportation and communication played important role in transformation of the settlements to today's modern towns and cities and the way forward. Study the Processes of Urbanization and the Problems associated to clearly understand and formulate new ways to solve it.
CO 4	Understand and Interpret The basic principles in town planning by studying the origin and growth of towns Learn The patterns and forms of planning ,list the requirements and planning of new towns by understanding various schemes
CO 5	Learning of Various surveys and how to use them in extracting data and the creation of data bank, zoning Basic knowledge on various types of housing and its role, slums and the role of recreational areas, Industries Making of Master plan Objectives, Importance and Procedure and type of roads and Its Importance in growth of any settlement.

COURSE CONTENTS

Unit I

Evolution of Human Settlements, Its Importance & Types, and Growth of Human settlements through Historical Periods.

Historic Evaluation: Brief review of the origin of early human civilization and its effect on Human settlements, Determinants of Human Settlements, Development of various settlement forms. Settlements in Ancient ,Medieval, Renaissance ,Industrial and Post Industrial ages.

Sociological aspects: Essential elements of society. Rural and Urban Communities, Growth of Socio-cultural thought through the ages. Types of settlements (urban and rural) and their characteristics & Pattern. Ancient towns in India.

Unit II

Human settlements and Their Characteristics and Political expression

Importance of Shelter and Its form and Scale in city, concepts of land Marks, Axis and Orientation, City as Living commercial, cultural and Functional Entities.

Understanding the settlements of Washing ton DC, Brazilia , New Delhi, Chandigarh, and Contributions of Ebenezer Howard, Lewis Mumford, Patrick Geddes, C.A. Doxiadis.

Unit III

Human Settlements in Changing World

Global City & City Origin; Global Economy and Trade, Information;

Importance of Transportation & Communication- potential and limitations of roadways, railways, airways and waterways in the development of a settlement; Technology and its Impact on cities,

Concept of Urbanization - Associated Problems; Cities of Future and Future Cities, Sustainable cities; Satellite Towns

Unit-IV

Evolution of planning; objectives of town planning, economic justification for town planning;

Principles of town planning:

a) Green Belt, housing,
b) public buildings,
c) recreational centers,
d) Road systems transportation facilities
e) zoning

Necessity of town planning;

Origin and growth of towns: topographical features and functional aspects;

Distribution of land use:

a) Town centers,
b) Industrial Area,
c) residential area,
d) Open Spaces,
e) town Peripher

Forms of planning:

a) local planning, b) country, planning c) regional planning	a) National planning and b) international planning

Requirements of a new town: function of the town; Welfare of the people

Planning of a modern towns and factors to be considered:

a) Density of development,
b) employment,
c) function, housing,
d) social grouping,
e) status of individual,
f) workplaces

Town planning schemes;

Town planning in ancient India; Indus Valley Civilization, Mohenjo-Daro, Lothal.

Unit V

Town Planning Surveys- Types of surveys and use of surveys;

Data collection - Methods, Analysis, Presentation and Report making;

Zoning-Introduction to zoning its objectives, principles advantages and importance.

Brief introduction to various topics:

a) **Housing** and types; **Residential buildings**-classification and design of a residential area,
b) **Slums -** characteristics and effects;
c) **Recreation Areas -** Types; Parks and Playgrounds and classification of parks;
d) **Industries -** classification , importance and requirement of industries and design of industrial township;
e) **Public buildings -** classification and design principles of public buildings.
f) **Building bye laws -** definition of standard norms regulations byelaws and laws objectives and importance of bye laws
g) **Development plan and Master plan**- Objectives, Importance and Procedure.
h) **Urban Roads -** importance and necessity urban roads under classification and types of street systems and traffic management and objectives; different traffic surveys; road junctions and intersections.

REFERENCES BOOKS:

1) John Radcliffe, An Introduction to Town and Country Planning , Hutchinson 1981.
2) Text book of Town Planning, A.Bandopadhyay, Books and Allied, Calcutta 2000
3) Rangwala, S.C. & Others. Town Planning, 29th ed. Charotar Pub. House, 2016.
4) N.V.Modak, V.N.Ambedkar, Town and country planning and Housing, orient longman,1971
5) G.K.Hiraskar, Town Planning
6) Buch, N. Mahesh. Planning the Indian city.
7) Doxiadis, C.L. Ekistics: Introduction to the science of Human Settlement.
8) Gallion, B. Arthur & Eisner, Simon. Urban Pattern: City Planning & Design, 5th ed. VanNostrand Reinhold, New York, 1986.
9) Khosla, R.K. Urban and Rural Development in India.
10) Patterson, T. William. Land-use Planning Techniques of Implementation.
11) John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
12) Rappoport, Amos. House, Form and Culture.
13) N.V.Modak, V.N.Ambedkar, Town and country planning and Housing, orient longman, 1971.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes :AR 412(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	1	3	2	2	3	3	3	1	1	3	3	3	3	3
CO2	2	3	2	2	3	2	2	3	3	3	2	1	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3	3	1	2	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total	14	15	12	12	15	13	13	15	15	15	10	10	15	15	15	15	15

AR 413(C16) : ADVANCED SERVICES

Studio Periods/Week	**:3**
Studio Periods / Semester	**:54**
Credits	**:3**
Internal Assignments & Mids	**:50 Marks**
External Examinations	**:50 Marks**
Total Marks	**:100 Marks**
Duration of Exam	**:3 Hrs.**

TIME SCHEDULE

S.NO	Major Topics	No. Of Periods	Weightage of Marks	Short Answer Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit I (Fire Safety in buildings & lifts)	12	10	1	2
2	Unit – II (Electronic Systems in Buildings/Automation)	11	10	1	1
3	UnitIII (Swimming pools)	11	8	1	2
4	UnitIV (Environmental services)	10	10	1	2
5	Unit – V (Special services in High rise buildings)	10	18	1	2
	Total	54	74	5	8

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course supplements the previous theory of building services and to introduces the advanced developments in them. The students are expected to understand the theory and Practical application of Advancement in buildings, connecting it to electrical and water supply services.

COURSE LEARNING OBJECTIVES:

- The course is intended to develop the techniques of Architectural rendering, Graphic skills.
- required for effective presentation techniques.
- To impart the skills of composition, rendering and presentation.
- To focus on the Principles that regulate how well a composition of lines and shapes conveys the Illusion.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Analysis the techniques and types of shadows with angles.
CO 2	Knowing the types and techniques of renders in it.
CO 3	Getting to know about the logo design and digital presentation skills

COURSE CONTENTS:

Unit I

Fire Safety in buildings: portable firefighting equipment, NBC standards, built in wet riser system, sprinkler system, fire hydrant, class of fire and occupancy, Fire safety design, planning for fire protection, Fire detection & fire fighting, Different firefighting methods to be adopted in buildings.

Lifts &Escalators, their requirements (space and parts), types of lifts, standard requirement as per Norms and capacity calculations.

Learning Outcomes:

The students will be able to

Classify different equipment's required and related to various fire issues.

Understand rules to be followed for keeping fire safety in buildings.

Understand the use of various types of lifts and placement according to area and requirement.

Unit II

Electronic Systems in Buildings: Telephone and communication, networks in buildings EPABX, importance of BAS (building automation Systems), Security systems, Burglar alarms, video surveillance, access control, access flooring, server rooms, IOT, DTH Internet and Television Network.

Learning Outcomes:

The students will be able to

Understand different modes of communication and systems required for the same.

Analyze the latest technology used in a smart building.

Understand various services required for buildings which use Internet or computer based work.

Unit III

Swimming Pools: Pool tank design, patio, finishes, Water circulation, cascades, channels, filtration and water treatment, Water quality and disinfection, balancing tank. Hotel services: Specialty services required for hospitality industry, ex: hotel: Laundry services, Kitchen services, Channeled Music, Internet.

Learning Outcomes:

The students will be able to

Understand the design requirements of a swimming pool and its placement.

Analyze the different types of services required for a hotel and design according to that

Unit IV

Environmental services: waste generation in buildings, various types of waste, solid, liquid, gas, treatment and disposal facilities, waste management in hospital buildings. Alternative energy sources for buildings: hot water solar energy system, applications of photo voltaic cells, biomass digesters, wind energy.

Learning Outcomes:

The students will be able to

Understand the importance of learning waste management strategies and propose methods to reduce pollution related to waste disposal.

Compare conventional and nonconventional sources of energy and specify their appropriate.

Unit V

Special services in High rise buildings: vertical transportation, plumbing and sanitary systems, Lightning arresters, Electrical distribution, Garbage Chutes, Cooking gas distribution

in High-rise buildings.

Learning Outcomes:

The students will be able to

Understand the term" highrise"and the importance of learning services required for a such building, rules to be followed while deigning and construction of the same.

REFERENCES BOOKS:

1) Faber, Oscar and Kell, J.R. Heating and Air-Conditioning of Building. Architectural Press, Surrey, 1945.
2) Prasad, Manohar. Refrigeration and air-conditioning, 5thed. New Age Intl. Pub., New Delhi, 1996.
3) Tiwari, Satish. Water and Energy resources.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR 413(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	2	1	1	2	1	-	1	3	2	1	1	-	-
CO2	1	3	1	3	1	2	1	1	-	1	-	2		1	1	-	-
CO3	3	2	2	3	1	2	1	1	1	1	1	3	1	2	3	-	2
CO4	3	2	2	3	2	1	1	1	1	1	1	3	1	1	2	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	2	-	1	1	-	1
CO6	1	2	2	2	1	-	1					1		-	-	-	-
Total	13	15	11	16	08	08	06	07	03	03	03	14	04	06	08	-	6

AR 414(C16) : ADVANCED CONSTRUCTION& STRUCTURAL SYSTEMS

Studio Periods/Week :4
Studio Periods / Semester :72
Credits : 4
Internal Assignments & Mids. :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Drawing Exam)

TIME SCHEDULE

S. No.	Major Topics	No. of Periods	Weightage of Marks	Short Answer Questions	Essay Questions
			End Exam	End Exam	End Exam
1	UnitI (Advanced construction methodsin RCC)	10	10	1	1
2	UnitII (Folded plates)	10	8	–	1
3	UnitIII (Advance Construction techniques for long span structures)	12	18	1	2
4	UnitIV (Curtain walls)	10	8	–	1
5	UnitV (Advanced Building Materials)	10	10	1	1
6	UnitVI (Relation between structure and architecture)	10	10	1	1
7	UnitVII (Prefabrication Systems for Buildings)	10	10	1	1
	Total	72	74	5	8

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course introduces to the methods and techniques of construction of structures using different advance materials. The course supplements the previous courses on theory of structures and building construction while introducing the advanced development in the building forms. The students are expected to understand the theory behind these structural forms and not expected to solve numerical problems. They are also expected to understand the theory and Practical nuance of Advanced Construction Practices.

COURSE LEARNING OBJECTIVES:

1) To develop an understanding of the different forms of arches, domes, and various geometrical forms of shell and plate structure.
2) Introduction of advanced construction materials, and adaptation in various architectural buildings.
3) Introduction to pre-engineered Concrete structures, and adaptation in large-span structures.
4) Study of Glass systems and their adaptation in buildings.
5) Study of advanced building materials and their application in the building industry.
6) To make the students understand the recent developments in structural forms.
7) To increase the student's ability to identify the structural forms suitable for architectural expression.
8) To encourage students to adapt effectively to architectural design development.
9) To familiarize students with the various support systems for the execution of a structure.

1) At the end of the course work, the students would be able to understand the importance of various structural and construction techniques and methods for practical designs.
2) The students will develop knowledge of the preparation of technical drawings for various small and long-span structures.
3) Learning and understanding the materials, structure, and construction through various trends in architecture.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To understand the use of advanced materials in construction and learn their fundamental principles of application.
CO 2	Analyze and gain knowledge about recent developments and advanced concepts in structural forms.
CO 3	Analyse and understand the nature of stresses that are developed in the major elements of advanced types of structures.
CO 4	Explore and enhance knowledge about various advanced structural systems.

CO 5	Develop the ability to use these structural systems in architectural design development and explore the advanced materials that can be used for construction through various surveys and market analysis.
CO 6	To understand the theory behind these structural forms and expected to solve numerical problems.

COURSE CONTENTS:

Unit- I

Advanced construction methods in RCC- pre-stressed concrete beams slabs frames, lift slab construction post tensioning, uses of rapid-hardening cement, ready mix concrete [RMC} , light weight concrete surface finishes of cement.

Unit- II

Folded plates - RCC Folded plates like V-type, trough type, pyramidal, prismatic and RCC geometrical staircases, hyperbolic paraboloids, grid systems; Introduction to shell structures

Unit- III

Advance Construction techniques for long span structures- Erection of suspended roofs,.Types and forms of roofing in steel and RCC, their applications to factories sheds, halls, Hangers, canopies, Patent Glazing, Introduction to Membrane structures.

Unit- IV

Curtain walls: types of curtain walls, components, structural solutions, construction and erection. glass wall system-glass; sheet metal wall systems.

Unit- V

Advanced Building Materials- PVC, metals, synthetic boards, fire proof/ resistant boards/tiles, acoustic materials, glass, composite panels and their applications, non- load bearing gypsum blocks

Unit – VI

Relation between structure and architecture: Geometry of form and structural function, Aesthetic theories of the expression of structural function in architectural form.

Unit – VII

Prefabrication Systems for Buildings -The concept – Principles — Floor Systems & Walls

– Prefabrication in Developing Countries. Introduction – Properties of Indian standard rolled steel sections – Types of loads – Permissible stresses in tension, compression and shear as per IS code.

COURSREFERENCE BOOKS:

1) Krishna Raju, "Prestressed Concrete", Tata McGraw - Hill Publishing Co. Ltd., New Delhi, 1997. 2. Orton, Andrew "The way we Build Now, Form, Scale & Technique," E & FN SPON, London, 1994.
2) Candela, Felix. Architecture and Structuralism. 1963.
3) Lane, Allen. Developments in Structural Form. Penguin Books ltd, London, 1975.
4) Macdonald, J. Angus. Structure and Architecture, 2nd ed. Architectural Press,Oxford, 2003.
5) Michaels, Leonard. Contemporary Structures in Architecture. 1950.
6) Schall, Rolf. Curtain Walls: Design Manual. Reinhold Pub., New York, 1962.
7) Siegel, Curt. Structure and Form in Modern Architecture. Crosby Lockwood and son Ltd., London, 1962.
8) Subramanian, N. Principles of Space structures. Wheeler and Co., Allahabad, 1983.
9) Zannos, Alexander. Form and Structure in Architecture: The role of statical function. Van Nostrand Reinhold Co., New York, 1987.
10) James Ambrose, Building Construction Enclosure System 1990.
11) Andrea deplazes (ED), Constructing Architecture: Materials processes structures-A hand Book Second Extended edition.
12) Robert E Fischer, Engineering for Architecture 1989.
13) R Barry, The construction of Buildings Volume 4 4th Edition.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR414(C 16)	Program Outcomes Po's													Program-Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	-	-	1	-	-	-	-	-	-	-	3	-	-	1	-	-
CO2	-	-	2	1	-	1	-	-	-	-	1	1	-	-	1	-	1
CO3	-	-	2	1	-	1	-	-	-	-	1	1	-	-	1	-	-
CO4	-	-	3	1	-	1	-	-	-	-	1	1	-	-	1	-	-
CO5	-	-	1	-	-	-	-	-	-	-	2	-	-	2	-	-	1
CO6	1	-	2	-	-	1	-	-	-	-	1	-	-	-	2	-	-
Total	02	-	10	04	-	04	-	-	-	-	06	06	-	02	06	-	02

AR415.1(C16) : HOUSING (ELECTIVE-1)

Periods / Week : 4
Periods / Semester : 72
Credits : 4
Internal Assignments & Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3Hrs (University Exam)

TIME SCHEDULE

S.NO	Major Topics	No. Of Periods	Weightage of Marks	Short Answer Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit-I Introduction To Housing	12	10	1	1
2	Unit-II Housing Standards	12	10	1	1
3	Unit-III Housing Schemes	16	18	1	2
4	Unit-IV Housing Agencies	16	18	1	2
5	Unit-V Housing Development & Design	16	18	1	2
	Total	72	74	5	8

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course introduces the basic concepts and issues related to urban and rural housing.

To enable the students to understand the fundamentals of housing needs, housing finance and housing techniques with relation to social and environmental effect.

COURSE LEARNING OBJECTIVES:

1) To outline the Issues concerning housing in the Indian Context and the various agencies involved in the production of housing.
2) To outline factors that influence housing affordability and to familiarize students with various schemes and policies of the government in the housing sector.
3) To inform about the standards and guidelines for housing
4) To inform about the various housing design typologies and the processes involves in housing project development.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To know the importance of housing and how the settlements developed from past to present.
CO 2	To understand the various guidelines and standards to design the housing development.
CO 3	To understand and familiarize with various schemes and policies of the government in the housing sector.
CO 4	To understand how the various housing agencies plays a major role in the housing development.
CO 5	To understand and acquire knowledge on various housing categories through practical experience (i.e., case studies).

COURSE CONTENTS

UNIT I

Introduction To Housing

Housing Need and Demand in India -Present and Future.

House, Housing and Settlement, Evolution of housing

Net & Gross Residential Density, Perceived Density

Major elements of housing policy: land, finance, material, technology & legislation

Unit II

Housing Standards

Housing design & standards, UDPFI – guide lines, standard and regulations

Units of housing design form and structure of housing as shaped by socio economic and physical parameters,

Housing systems & sub systems.

Housing demand and policy analysis.

Unit III

Housing Schemes

Understanding of various housing schemes-

Jawaharlal Nehru National Urban Renewal Mission (JNNURM),

Rajiv Aawas Yojana (RAY),

Basic Services for the Urban Poor (BSUP),

Integrated Housing & Slum Development Programme (IHSDP), and

Site & Services Scheme.

Unit IV

Housing Agencies

Housing demand and supply – National Housing Policy

Housing agencies and their role in housing development (HUDCO,NHB, State Housing Board.,)

Impact of traditional life style – Rural Housing, urban housing.

Unit V

Housing Development & Design

Understanding of various Housing categories through case studies e.g., Traditional housing, row housing, cluster housing, Affordable housing, Slum development, low cost housing – apartments and high rise housing relating to Indian situations

Understanding of Neighbourhood. Exercises of moderate magnitude on Neighbourhood Planning.

COURSREFERENCE BOOKS:

1) **Leuris (S),** Front to back: "A Design Agenda for Urban Housing", Architectural Press, 2006.
2) **Mohanty. L.N.P., Mohanty. S,** "Slum in India" APH Publications. 2005.
3) **Saxena A. K.** "Sociological Dimensions of Urban Housing and Development ", Common wealth Publications, 2004.
4) **Alexander, Christopher.** Pattern language: Towns, Buildings, Construction. Oxford University Press, New York.

5) **Chiara, De Joseph and Others.** Time savers standard for Housing and Residential development, 2nd ed. McGraw Hill, Inc, New York.
6) **Desai, A.R. and Pillai, Devadas.** Slums and Urbanization, Popular Prakashan Pvt. Ltd.
7) **HUDCO.** Housing for the Low Income.
8) **Poulose, K. Thomas.** Reading Material on Housing. Institute of Town Planners, New Delhi.
9) Cedric Prgh (1990) Housing and Urbanisation, Sage Publication New Delhi.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR415.1 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	-	1	-	-	1	-	1	-	-	-	-	1	1	1	1	1	-
CO2	1	1	-	-	-	-	-	-	2	-	-	-	1	1	1	-	-
CO3	-	2	-	1	-	2	1	-	2	-	-	-	-	1	1	1	-
CO4	-	1	-	-	-	-	-	1	1	-	-	-	-	1		1	-
CO5	1	1	-	3	-	-	1	-	1	-	1	1	-	2	1	1	-
Total	02	06	-	04	01	02	03	01	06	-	01	02	01	06	04	04	-

AR 415.2(C16) : INTERIOR DESIGN (ELECTIVE – I)

Periods / Week : 4
Periods / Semester : 72
Credits : 4
Internal Assignments & Mids. : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3 Hrs (University Exam)

TIME SCHEDULE

S. No.	Major Topics	No. of Periods	Weightage of Marks	Short Answer Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit-I Introduction and Principles of Interior Design	8	16	_	2
2	Unit-II History of Interior Design	12	18	1	2
3	Unit-III Enclosing elements of Interior Design	10	12	2	1
4	Unit-IV Colours and Landscape in Interior Design	12	10	1	1
5	Unit-V Interior Lighting	6	10	1	1
6	Space Programming study and Business Perspectives of Interior Design	24	8	_	1
	TOTAL	72	74	5	8

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course provides a frame work of the discipline by addressing to the theoretical, social, historical, technological, professional aspects of Interior Design.

COURSE LEARNING OBJECTIVES:

1) To study the Interior Design principles and their applications in interiors and to foster creative ability and inculcate skills to understand and conceive architectural design.
2) To understand the theoretical, social, historical, technological, professional aspects of Interior Design.
3) To understand and implement the knowledge in interior design with regard to construction, lighting, furniture.
4) To understand the relationships between furniture – function – space, and product – function and to consider different materials, such as wood and metal and glass, other new materials, and relate these to their own design.
5) To focus on finding a personal approach in creative processes.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To understand and apply the fundamental principles of design such as proportion, scale, balance, rhythm, and unity in interior spaces.
CO 2	To work effectively in teams, communicate ideas clearly and effectively, and collaborate with other design professionals.
CO 3	To inculcate and be familiar with the properties, characteristics, and appropriate applications of various materials and finishes used in interior design along with an effective lighting scheme that enhances the functionality, ambience, and aesthetic appeal of interior spaces.
CO 4	To design and understand the importance of sustainable design practices and incorporate sustainable principles into their design solutions.
CO 5	To understand the professional practice of interior design, including project management, budgeting, and client communication.
CO 6	To understand the legal and regulatory requirements for designing interior spaces, including safety, accessibility, and environmental regulations.

UNIT I

Introduction and Principles of Interior Design:

Definition of Interior Design, Themes and Concepts: Elements and Principles Of Design- An Overview And Their Applications In Interior Designing.

The Profession Of Interior Design: Role Of An Interior Designer- Past And Present; Scope Of Services; Interior Design Process.

UNIT II

History of Interior Design:

Brief study of the history of interior architectural design through the ages relating to historical context, design movements and ideas etc.

Art and Interior Design: Purpose and Relevance Of Art, Development Of Art, Exploration of Art Forms, Study of Ornament In Interior Design, Introduction to Heritage Interiors, Basic Furniture Vocabulary. Styles of Interiors: Italian, English, French, Japanese Styles Etc.An Overview of Historical Perspective of Furniture and Styles, Accent Pieces and Accessories from Egyptian Period to the Present.

UNIT III

Enclosing Elements of Interior Design:

Introduction to various elements of interiors like floors, ceilings, walls, staircases, openings, interior service elements, incidental elements etc.

Materials: (Masonry, Timber, Cane, Bamboo, Wood, Paints, Varnishes (Oil and Spirit), Glass and their applications; Furnishings. Working Process of: Etched Glass, Wooden Carving, Plaster Work like POP, Gypsum

Methods of construction in order to obtain certain specific functional, aesthetic and psychological effects.

UNIT IV

Colours and Landscape in Interiors:

Colour Theory, Effect Of Light On Colour, Various Colour Schemes Like Analogues, Complementary, Triadic Etc. Colour Symbolism. Psychology Of Colour,

Industrial Colour Codes. International Standards. Role Of Landscape In Interiors

Elements Of Landscape Design In Interiors

UNIT V

Interior lighting:

direct and indirect lighting, location and light grid systems.

types of luminaries, quality of lighting. Ambient, task and accent lighting.

Exposure to eminent interior designers' works indian and international.

UNIT VI

Space programming studyand business perspectives of interior design:

Interior space planning and human dimensions. Focuses on physical, psychological behavioural and human factors, study of proxemics, behavioural settings.

Business perspectives of interior design – an overview of practice of interior design In india.

Design projects on residential, commercial and office interiors.

REFERENCES BOOKS:

1) **Archi world. Interior best collection:** residence, commerce, office, restaurant asia i-iv.
2) Archi world co., korea, 2003.
3) **Friedmann, arnold and others. Interior design**: an int. To architectural interiors. Elsevier, new york, 1979.
4) **Miller, e. William.** Basic drafting for interior designers. Van nostrand reinhold, new york, 1981.
5) **Kurtich, john and eakin, garret.** Interior architecture, van nostrand reinhold, new york,
6) 1993.
7) **Rao, m. Pratap.** Interior design: principles and practice, 3rd ed. Standard pub., 2004.
8) **Ching, f. D. K.** (1987). Interior design illustrated. New york : v.n.r. publications.
9) **Doshi, s. (ed.)** (1982). The impulse to adorn - studies in traditional indian architecture. Marg publications.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR415.2 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	-	2	1	-	2	-	-	-	1	-	1	-	2	1	1	1
CO2	2	-	2	1	-	-	2	-	-	1	1	1	-	2	0	1	1
CO3	3	-	2	2	-	-	-	-	1	3	1	3	2	2	0	1	1
CO4	2	-	2	1	-	2	-	-	1	1	1	1	-	2	1	1	1
CO5	2	-	2	1	-	2	2	-	1	2	1	1	-	2	1	1	1
CO6	2	-	2	1	-	-	2	2	-	1	1	1	-	2	1	1	1
Total	13	-	12	7	-	6	6	2	3	9	5	8	2	12	4	6	6

AR415.3(C16) : LANDSCAPE DESIGN

Periods / Week : 4
Periods / Semester : 72
Credits : 3
Internal Assignments & Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3 Hrs (University Exam)

TIME SCHEDULE

S. No.	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I (design with landforms in a site)	20	18	1	2
2.	Unit – Ii (hard and softscape elements in detail)	20	20	2	2
4.	Unit – III (site planning principles and techniques)	18	18	1	2
5.	Unit – IV (urban landscape and contemporary concerns)	14	18	1	2
	TOTAL:	**72**	**74**	**5**	**8**

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer no choice and each one carries 2 marks &
2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

This course introduces students to landscape design and site planning and relate it to design and planning of built environments. It provides an overview of development of landscape design, site studies, plant studies and application of the knowledge at various levels of design.

COURSE LEARNING OBJECTIVES:

1) To introduce the students to landscape design and site planning and relate it to design and planning of built environments.
2) To provide an overview of development of landscape design, site studies, plant studies and application of the knowledge at various levels of design.
3) To develop a conceptual understanding of landscape design and site planning principles.
4) To develop skills in integrating landscape design with built environments.

At the end of the course work, the students would be able to understand about the importance of site planning, and use it in their design work with the introduction of elements related to landscape, learning about proper indication of lines related to site planning and indication of trees in site and how to plan a site on the basis of factors present on the site or to be brought out.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Learn to Classify different types of landforms and working with a site having contours, with proper analysis of design factors.
CO 2	Understand in detail about the elements of hard and softscape in detail in site analysis and its application in architectural design, relation to representation of it in terms of drawing.
CO 3	Analyze about how zoning can be done in site in relation to internal streets in urban context and parking and other external factors representing architectural design
CO 4	Understand how design of landscape has brought changes in contemporary context. Understand Concerns and points to be noted down while designing landscape on an urban level.

COURSE CONTENTS:

Unit I

DESIGN WITH LANDFORMS IN A SITE

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

Learning Outcomes:

The students will be able to

Classify different types of landforms and working with a site having contours.

Unit II

ELEMENTS OF HARD AND SOFTSCAPE IN DETAIL

Hard landscapes: design of paths, roadways streets, terraces etc. and use of land form effectively.

Soft landscapes: design of lawns, shrubs, hedges, trees – in relation to buildings and other landscape elements.

Design concepts related to use of sculpture, outdoor lightings, Architectural feature, street furniture and grouping them into meaningful compositions for visual and functional effects

Learning Outcomes:

The students will be able to

Learn in detail about the elements of hard and softscape in detail and use of hard and softscape and its application in field, drawings related to that.

Unit III

SITE PLANNING PRINCIPLES AND TECHNIQUES

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.

Irrigation systems – sprinkler trickle irrigation, drip irrigation and laying irrigation networks.

Construction of structure in landscape circulation roads, parking, paths, level changes – walls, steps lamps, construction of screens, trellis, wall fences gales decks, pools etc.

Learning Outcomes:

The students will be able to

Analyze about how zoning can be done in site in relation to internal streets, parking and other external factors representing design.

Unit IV

URBAN LANDSCAPE & CONTEMPORARY CONCERNS.

Contemporary concepts and concerns related to landscape design.

Contemporary attitude to development and design of open spaces – Urban landscape and understanding the context today.

Learning Outcomes:

The students will be able to

Understand how design of landscape has brought changes in contemporary context.

Understand Concerns and points to be noted down while designing landscape on an urban level.

Assignments:

Written assignments related to the units above or, answer to the related questions given on the topic.

Collection/field identification of minimum 20 common Indian trees and 25 common Indian shrubs

Studio exercise emphasizing relationship between built form and outdoor areas and site planning issues. / preparation of a proper site plan/sheet presentation.

Design of a small area, related to any of the architectural design in the current semester with all details related to landscape.

COURSREFERENCE BOOKS:

1) **Blake, Alan.** Landscape Construction and Detailing. B.T. Bats ford Ltd., London, 1996.
2) **Colvin, Brenda.** Land and Landscape.
3) **Hacheat, Brian.** Planting Design.
4) **Harris, C.W. and Dines, T. Nicholas.** T.S.S for Landscape Architecture. McGraw Hill, New York, 1995.
5) **Laurie, Michael.** An Introduction to Landscape, 2nd ed. Prentice Hall, New Jersey, 1986.
6) **Lynch, Kevin.** Site Planning. MIT Press, Massachusetts, 1962.
7) John l.Mutloch. Introduction to Landscape Design, ,2nd ed.John Wiley & Sons,Inc,New york,2001

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR 415.3 (C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	3	3	3	2	2	-	1	1	-	1	-	2	-	-	-	-	3
CO3	3	3	2	2	2	1	1	1	1	-	1	2	-	-	1	-	3
CO4	3	2	2	2	2	1	1	3	-	-	1	1	-	1	-	-	3
Total	12	11	10	07	08	05	05	07	01	03	02	13	02	03	02	03	12

AR 415.4 (C16): BUILDING CONSTRUCTION & MANAGEMENT

(ELECTIVE – I)

Periods / Week :4
Periods / Semester :72
Credits :4
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I Introduction	8	8	-	1
2.	Unit–II Management Techniques:	12	12	2	1
3.	Unit– III construction equipment's	12	16	-	2
4.	Unit–IV Construction Safety Management:	10	10	1	1
5.	Unit–V Economics of Project Management	10	10	1	1
6.	Unit–VIBudgetary Control Systems:	12	10	1	1
7	Unit-VII Programming Techniques	8	8	-	1
	TOTAL:	**72**	**74**	**5**	**8**

Final exam question paper consists of PART-A for 10 marks which consists 5 short questions all 5 to answer no choice and each one carries 2 marks & PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

To introduce the importance of construction management in the field of architecture.

COURSE LEARNING OBJECTIVES:

1) To provide students with a basic understanding of the principles and practices of building construction, including building materials, methods, and technologies.
2) To introduce students to the various aspects of building design, including structural, mechanical, electrical, and plumbing systems.
3) To familiarize students with the legal and regulatory requirements for building construction, including building codes and permits.
4) To develop students' skills in project management, including budgeting, scheduling, and risk management.
5) To prepare students to work effectively with contractors, architects, engineers, and other professionals involved in the building construction process.
6) To encourage students to think critically and creatively about building design and construction, and to develop innovative solutions to construction challenges.
7) To promote ethical and sustainable practices in building construction and management, including environmental considerations, safety, and social responsibility.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understand the significance of construction in India and its role in national development. Recognize the importance of management in construction and how it contributes to successful project completion. Describe the role of a construction manager in overseeing and coordinating construction activities. Identify the various members of a construction team and their roles and responsibilities. Understand the authorities and responsibilities of a construction manager in an organization.
CO 2	construction projects, advantages of planning and the stages involved in planning. scheduling, methods of scheduling. Understanding the concept of project management through networks, including its objectives, advantages, and the different types of networks used. Ability to define project management through networks, such as events, activities, paths, and critical path. Knowledge of the rules for drawing a network.Understanding the difference between PERT and CPM and their applications in construction project management. Familiarity with critical path in a project network and its importance in project management.

CO 3	Understand the types of construction equipment used in large scale projects, characteristics and performance of different types of construction equipment equipment in different stages of a construction project. Estimate the manpower required at different stages Understand the materials , Estimate materials procurement requirements and maintain inventory and stock control quality control in construction projects . Understand and use quality assurance techniques to ensure the quality of a construction project.
CO 4	understand the provisions of the Payment of Wages Act and its applicability to the construction industry, able to explain the provisions of the Migration Act, the provisions of the Contract Labor Act, Workmen's Compensation Act, Construction Safety Management etc.
CO 5	Economic analysis of projects, cost-benefit analysis, cost-effectiveness analysis, and return on investment analysis, Sensitivity analysis, Cost estimating principles, cost estimates, including labor, materials, equipment, and overhead costs, Cost concepts, Cost analysis for control.

COURSE CONTENTS

Unit I

Introduction :

Construction in India; its role in development, importance of Management in Construction, role of Construction Manager, Construction team, responsibilities and authorities of Construction Manager Organization.

Unit II

Management Techniques:

Planning for Construction Projects: Principles, objectives, advantages of planning, stages ofplanning. scheduling: Definition, advantages

Methods of Scheduling: Bar chart, Milestone chart, Controlling, Life cycle cures. Job layout,work break down structure

Project Management through Networks

Introduction, objectives, advantages, terms and definitions, types of networks, rules for drawing anetwork, Fulker son's Rate of numbering the events.

Introduction to PERT, CPM, difference between PERT and CPM, finding critical path.

Unit III

Introduction to construction equipment's, performance, characteristics and usage of equipmentused in large scale projects.

Human Resource management: manpower estimation at various stages, recruitment, training,under and over manning.

Materials Management: Materials of construction, classification codification, ABC analysis, estimation of materials procurement, inventory / stock control, purchase procedure, stores management.

Quality control in Construction: Importance of quality, elements of quality, organization for quality control, quality assurance techniques.

Unit IV

Labor Legislations pertaining to construction industry, payment of wages act, migration Act, Factories Act, Contract Labour Act, Labour Welfare Fund Act, Workmen's Compensation Act.

Construction Safety Management: Importance of safety causes of accidents, safety measures,safety benefits to employees, employees and customers.

Unit V

Economics of Project Management: Economic analysis of projects, economic studies, sensitivity analysis. Cost estimating principles, parameter estimation, detailed estimates, costconcepts, classification of costs, elements of costs, and cost analysis for control.

COURSREFERENCE BOOKS:

1) **Gupta, B.L. and Gupta, Amit.** Construction Management, Machinery and Accounts, 3rd ed.Standard Pub, 2005.
2) **Loraine, R.K.** Construction Management in Developing Countries. Thomas Telford,London, 1993.
3) **Srinath, L.S.** PERT and CPM Principles and Applications, 3rd ed. Affiliated East-West Press,New Delhi, 2003.
4) **Singh, Harpal.** Construction Management and Accounts 14th ed. Tata McGraw-Hill Pub., NewDelhi, 1981.
5) **Gould, E. Frederick and Joyce, E. Nancy.** Construction Project Management. Prentice Hall,New Jersey, 2000.
6) **Shrivastava, U.K.** Construction Planning and Management, 3rd ed. Galgotia Pub., New Delhi,2004.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes : AR 415.4(C 160	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	1	3	3	3	3	2	3	3	3	3	3	2	3	3
CO2	1	3	2	1	3	1	3	3	1	3	3	2	3	3	2	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	1	3	1	3	3	1	1	3	1	2	2	1	3	3	2	3	3
CO5	1	3	1	3	3	1	1	3	1	2	2	1	3	3	2	3	3
Total	9	14	9	11	15	9	11	15	8	13	13	10	15	15	11	15	15

AR 416(C16) : ADVANCED DESIGN STUDIO

Studio/Drawing Periods/Week : 9
Studio/Drawing Periods/Semester : 162
Credits : 9
Internal Assignments : 200 Marks
External Examinations : 200 Marks
Total Marks : 400 Marks
External Jury : Viva Voce

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Internal Marks	Viva voce Weightage of External Marks
			Internal review	External jury
Major problem: (from one of the major problems)				
1.	Data collection: Literature study, case study	27	20	20
2.	Site Selection and Documentation	45	40	50
3.	Site analysis and conceptual design proposals	63	60	70
4.	Model		10	10
Total			130	150
Minor problem				
4.	Time problem(from one of the minor problems)	27	50	50
5.	Attendance		20	
	Total:	**162**	**200**	**200**

COURSE OVERVIEW:

This course is intended to provide skills for designing large scale projects in commercial, industrial and recreational projects with the requirement provided in the course.

COURSE LEARNING OBJECTIVES:

- To document heritage precincts and buildings and enumerate their historic context
- To design and suggest conservation measures, extensions and adaptive reuse of derelict heritage buildings
- To enable the students to study the existing built environment in urban settings, to understand Human behavioural, character of the place, including socio-cultural aspects.
- Evolve a methodology of documenting heritage buildings
- To develop skills for a comprehensive design in areas of campus design, industrial designs and recreational spaces for making a complete design portfolio from the brief to tender drawings.

COURSE OUTCOMES:

CO 1	Analyzing the aspects of architectural design in heritage and research on the evolution of the buildings which are being sustained from cultural and architect's point of view in terms such as materials, construction techniques, and aspects of structure, envelope and aesthetic factors.
CO 2	Understanding the value of heritage buildings through learning grading and documentation as a research analysis making them learn the importance of conservation and its techniques relating it to the historical aspects of the place be it an urban or rural context,
CO 3	Formulation of the knowledge acquired from existing studies, comparative analysis from the research done in literature and application of the same to the outcome to acquire solutions to complex design problems, which would include environmental and energy efficient systems of design.
CO 4	Learning to produce solutions to the design through review process and designing concepts which would include logical thinking, involving the various factors of culture and context which would work for the wellbeing of the occupants, through drawing techniques and architectural illustrations in design.

COURSE CONTENTS:

Major Problems: 1) Heritage Design

The course encourages students to evolve design strategies to adaptively re-use heritage buildings, like palaces, medieval museums, colonial buildings in disuse and disrepair, colonial era railway stations, historic institutions etc

Projects could also involve adoptive reuse or addition / to an existing building having significant architectural characteristics; Students are introduced to urban development control; codes and bye laws; Special zoning guidelines related to heritage conservation;

Exercises in articulation and manipulation of programmed needs, design methodology, criticism and evaluation of alternative concepts are to be performed.

2) Campus Design:

Issues to be addressed for the design project pertaining to campus design:

- Issue in preparation of master plan for institutions: academic, administrative, staff housing, student hostel etc.,
- Environmental considerations
- Phases of development
- Scope for expansion for future developments
- Details pertaining to be disabled

Minor problems:

1) Sports academy: i) Indoor Sports Complex (Billiards, Cards room Etc.,)
   ii) Tennis Center
   iii) Basket Ball Park
   iv) Football Stadium
2) Industrial projects : Small Scale Industries (Building Material Manufacturing , Interior Furnishings industries etc.,)
3) Landscape project with inclusion of energy efficiency systems.

Internal submission:

- The designs should have literature, case studies and comparative analysis before the final design is done.
- Site analysis, design methodology and conceptual design development inciuding area statements.
- Drawings of design to be submitted manually or digital with the required parameters.
- Design problem to be submitted in the given format.
- One major design exercise and one minor design /timeproblem should be given

COURSREFERENCE BOOKS:

1) Chukwunyere C. Ugochukwu, Urban Neighborhood Revitalization and Heritage Conservation: The Architecture of Urban Redesign,) Edwin Mellen Press Ltd. 2006.
2) James Strike, Architecture in Conservation: Managing Development at Historic Sites, Routledge, 2012.
3) Kenneth Williamson, Development and Design of Heritage Sensitive Sites: Strategies for Listed Buildings and Conservation Areas 1st Edition, Routledge, 2010.
4) AylinOrbasli, Philip Grover, Architectural Conservation: Principles and Practice John Wiley & Sons, 2007.
5) Richard.d.dober.campus architecture:building in the groves of academy.mcgraw hill,new York,19.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR416(C 16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	2	-	3	-	3	3	1	1	-	3
CO2	3	3	3	2	2	-	1	1	-	3	1	2	1	-	-	-	3
CO3	3	3	2	2	2	1	1	1	-	3	-	1	1	-	1	-	3
CO4	3	2	2	2	2	1	1	1	1	3	-	1	-	1	-	-	3
TOTAL	12	11	10	7	8	3	5	5	1	12	1	7	5	2	2	-	12

AR421(C16) : BUILDING ECONOMICS AND SOCIOLOGY

Periods / Week : 3
Periods / Semester : 54
Credits : 3
Internal Assignments &Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I	11	18	1	2
2.	Unit – II	10	10	1	1
3.	Unit – III	10	18	1	2
4.	Unit – IV	11	10	1	1
5.	Unit – V	12	18	1	2
Total:		54	74	5	8

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

To introduce the economics and sociological aspects in architecture.

COURSE LEARNING OBJECTIVES:

1) To introduce students to the basic principles of micro and macro economics as they apply to the building industry.

2) To help students understand how economic factors such as supply and demand, cost minimization, profit maximization, and market competition affect the building industry.
3) To equip students with a comprehensive understanding of the cost concepts and their development in the construction industry, Urban land utilization, Housing Analysis and services.
4) To help them evaluate and understand the efficiency of buildings in terms of their cost-effectiveness and resource efficiency, Building life cycle and opportunities for cost reduction and different financial sources & planning authorities.
5) Understanding the social and cultural factors that shape the formation and functioning of families in different societies, impact of social and economic changes on families, role of media and technology
6) Understand the relationship between culture, lifestyle, and architectural design impact of cultural norms and values on housing design.
7) Understanding of various social problems like isolation, privacy etc and how to design any project which is universally accessible and understand the power structure in the society for proposal and approval of a project in Government.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understand & Analyze the fundamental principles of micro and macro economics and how they apply to the building industry
CO 2	Understand the basic inputs required for building construction, including land, labor, capital, and materials, and how these inputs interact with each other in the construction process. Concept of urbanization its impact, utilization of urban land, Housing analysis, Services and the challenges associated with creating sustainable and livable communities.
CO 3	Analyze the life cycle of a building and its costs, including planning, construction, maintenance, and demolition, building efficiency and cost reduction through the design of building components, the use of new materials, and innovative construction techniques, Building Acts, Project Funding, zoning laws and building codes.
CO 4	Understand Concept of family as the basic unit of society, differences in lifestyles that arise due to regional background, religions, caste, income group, etc., and their implications in shaping the design of housing units. Sociological aspects that have influenced the evolution of housing/shelter forms throughout history and understanding of the relationship between architecture and society.
CO 5	Students will be able to understand key sociological concepts such as interaction, isolation, privacy, accessibility, conflict, and alienation, and how these concepts are related to building design by overcoming them. To analyze power structures in society, including local, government, and administrative structures

COURSE CONTENTS

Unit I

Brief introduction of general economics through micro and macro economics as applicable to building Industry. Micro economics: The market, budget constraint, choice, demand and supply,Uncertainties equilibrium, technological constraints, profit maximization and cost minimization, Monolopy and Oligopoly.

Macro Economics: GNP, NNP, inflation, interest rate, employment, saving and investment, monitory and fiscal systems and policies.

Unit II

General economics of the basic inputs into building construction – Land, Labour, Capital and Materials. Study of cost concepts and development – Urbanization and planning Urban Land utilization Housing analysis, public Housing, Urban public utility services – problems and perspective.

Unit III

The Economics of Building costs. Building efficiency, Building life cycle and cost reduction through planning design of building components, Use of new materials and innovative construction techniques etc. Rent and other Building Acts. Financing of Projects, Agencies and institutions influencing economics aspects of project.

Sociology:

Unit IV

Family as the basic unit of society. Differences in lifestyles due to regional background, religions, caste, income group etc., and their implication in Architectural design of the housing units. Sociological aspects in the history of the evolution of housing/shelter forms.

Unit V

Sociological problems of interaction, isolation, privacy, accessibility, conflict, alienation related to planning and design of different buildings with the references to the people of different age groups of population. Power structures in society- local, Government, administrative structures- Structure of decision making process related to building projects.

COURSREFERENCE BOOKS:

1) Building economics for Architects – T.Mann
2) Economics for engineers – M.L.Gupta.
3) Modern Economic theory – K.K.Dewett.
4) Ferry J.D & Brahdan S.P(1994), Cost planning of buildings, BSP Professional Books.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes :AR 421(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	1	3	3	3	3	2	3	3	3	3	3	2	3	3
CO2	1	3	2	1	3	1	3	3	1	3	3	2	3	3	2	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	1	3	1	3	3	1	1	3	1	2	2	1	3	3	2	3	3
CO5	1	3	1	3	3	1	1	3	1	2	2	1	3	3	2	3	3
Total	9	14	9	11	15	9	11	15	8	13	13	10	15	15	11	15	15

AR 422(C16): DISSERTATION

Studio/Periods/Week :4
Studio/Periods/Semester :72
Credits :4
Internal Assignments : 100 Marks
External Examinations : -
Total Marks : 100 Marks
Internal Jury : Viva Voce

TIME SCHEDULE

S. No.	Major Topics	No. of periods	Viva voce Weightage of Marks Internal jury
1.	Topic selection	8	15
2.	Study/Research work	48	
3.	Paper presentation	8	50
4.	Internal Viva-Voce	8	25
5.	Attendance		10
	Total:	**72**	**100**

Note: (a) For assessment:

1) Final assessment of the students' work is be based on written Paper as well as oral communication.
2) Students need to write a paper on selected topic in structured manner.
3) After submission of the paper the department at its convenience will arrange for the
4) conduct of the viva-voce examination.
5) The paper will be evaluated at a viva-voce by a jury consisting of One External, one internal and head of the department or his nominee.

COURSE OVERVIEW:

The course provides students with a framework to understand some emerging concepts in architecture and projects of design complexity and equip the student with adequate architectural design research methods for the realization of thesis concept. During the course of study, the subject of the thesis is developed and the project articulated.

COURSE LEARNING OBJECTIVES:

1) To understand Design vocabulary, presentation in research preparation and its relation to Architecture.
2) To Design research exercises that explore Architecture as responding to various aspects such as contextual, social, economic, cultural and political issues.
3) To develop the research topics according to the user requirements with implementing methods of research for obtaining practical solutions.
4) To prepare the research, keeping in mind the standard norms followed for types of research.

1) At the end of the course work, the students would be able to understand about the importance of research in architecture as a way to solve various design issues.
2) The students will develop knowledge of the preparation of reports and research publications for various architectural topics or issues.
3) Learning and understanding the relation of theorical and practical approaches in design through detailed research studies.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Enable students to establish a strong fundamental theoretical foundation, clarity of thought and also to orient the students to structured research in a focused manner.
CO 2	To conduct in depth analysis and objective research on a topic of their interest understanding the human needs, buildings and environment.
CO 3	Design, research exercises that explore Architecture as responding to various aspects such as contextual, social, economic, cultural and Standards issues.
CO 4	Learning and understanding the design response to various aspects through research studies making detailed reports and effective presentations.
CO 5	To review and research complex design problems related to architecture to satisfy function, aesthetics and technical requirements.
CO 6	Study of the physical, socio economic and cultural aspects of a selected place to Understand the settlement pattern and amenities that are existing or required.

COURSE CONTENTS:

Students may choose a topic related to Architecture and allied subjects. The topics must be vetted by the faculty. Emphasis must be on critical understanding, logical reasoning and structured writing.

Students may be encouraged to select the topic which may eventually culminate in the Architectural Design Thesis of the subsequent semester.

Students are expected to present the progress of the study at various stages of the semester. Final assessment of the students' work may be based on written Paper as well as oral communication. However, greater weightage may be given for writing skills and research content of the study.

INTERNAL SUBMISSION:

Students need to submit paper with not less than 3500 words. Standard referencing conventions and technical writing norms must be adhered to.

COURSREFERENCE BOOKS:

1) Anderson, J. and Poole, M. (1998). Thesis and assignment writing. Brisbane : John Wiley. Borden, I. and Ray, K. R. (2006). The dissertation: an architecture student's handbook. 2nd Ed. Oxford : Architectural Press.
2) Fink, A. (1998). Conducting research literature reviews: from paper to the Internet. Thousand Oaks : Sage.
3) Murray, R. (2005). Writing for academic journals. Berkshire:Maidenhead, Open University Press.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR422(C 160	Program Outcomes Po's													Program-Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	-	1	-	-	1	-	-	-	3	-	-	1	-	1	1	-
CO2	-	-	1	-	-	1	1	-	-	3	-	-	-	-	1	1	-
CO3	-	1	-	-	3	-	2	-	1	2	-	-	1	2	-	1	-
CO4	-	2	-	1	1	-	2	1	-	3	-	-	-	1	3	1	1
CO5	2	-	2	-	-	2	-	-	-	1	-	-	-	1	1	-	2
CO6	-	-	1	2	-	1	-	-	-	1	1	-	-	-	2	1	1
Total	03	03	05	03	04	05	05	01	01	13	01	-	02	04	08	05	04

AR 423(C16) : ADVANCED COMMUNICATION SKILLS

Periods / Week : 3
Periods / Semester : 54
Credits : 3
Internal Assignments &Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods
1	Unit-I: Presentation Skills	12
2	Unit-II: Employability Skills	12
3	Unit-III: Professional Writing Skills	10
4	Unit-IV: Personality Development & Soft Skills	10
5	Unit-V: Descriptive Skills	10
Total		**54**

COURSE LEARNING OBJECTIVES:

- To enhance the students ability to communicate effectively.
- To develop reading competencies for academic and competitive requirements.
- 3.To write effectively to meet the professional needs.
- To develop employability skills.
- To improve character traits and Interpersonal skills.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO1	To define the fundamentals of speaking skills and enhance effective presentation skills in students.
CO2	To analyze the importance of employability skills among the students by practicing speeches, group discussion, handling conversations.

CO3	To explain the importance of professional writing skills which helps them to write effective reports, documents, emails etc.
CO4	To Improves non-verbal communication skills like body language eye contact and facial expressions to build confidence credibility. Develops leadership qualities, negotiation skills and stress management skills and team management skills which helps them to survive in architectural community.
CO5	TO enhance the descriptive skills like describing a project, building plans, structures, layouts, complex architectural designs effectively in their profession.

Unit I

Presentation Skills

a) Paper Presentation or Oral Presentation

b) Debate

c) Extempore

Learning Outcomes:

The students will be able to

- Analyse the importance of presentation
- Identify the various stages of presentation
- Prepares them to give a good effective presentation.

Unit II

Employability Skills

a) Resume Preparation

b) Group Discussion

c) Interview Skills

Learning Outcome:

- Able to prepare their own resume.
- Improves their thinking level at various situations.
- Enables the student to become a professional.

Unit III

Professional Writing Skills

a) Job Application Letters or Covering Letters

b) Methods of Data Collection

c) Interpretation and Report Writing

Learning outcomes:

- Explains the importance of letter writing.
- Identify various data collection methods/tools.
- Explains various types of reports and improves writing skills.

Unit IV

Personality Development & Soft Skills

a) Body Language

b) Negotiation Skills

c) Stress Management

Learning outcomes:

- Explains importance of body language in day to day communication.
- Enables them to keep prepare for meeting.
- Enhances them to improve collaboration and teamwork.
- Enables them to identify their own emotions.

Unit-V – Descriptive Skills

a)Process Description

b)Picture Description

Learning outcomes:

- Improves students writing skill.
- Improves vocabulary level of the student.

Assignments: 1. Oral and Power-point presentations
2. Mock Interviews
3. Research paper/Report writing
4. Data Collection
5. Review writing

MODE OF END EXAM – Record Submission, LAB & VIVA

COURSREFERENCE BOOKS:

1) 1. Communicate to Conquer: A Handbook of Group Discussions and Job Interviews with CD, PHI Publications.
2) The ACE of Soft Skills: Attitude, communication and Etiquette for Success, by Pearson Publications.
3) Communication Skills, LeenaSen, 2nd Edition, PHI, 2007.
4) Communication Process and Product,by Pearson Publication 8th edition Sharon Gerson& Steven Gerson.
5) Organizational Behavior, Stephen P. Robbins and Timothy A. Judge, 13th Edition, PHI, 2009.
6) Business Communication, Meenakshi Raman and Prakash Singh, Oxford University Press, 2006.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR 423 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	-	-	-	-	-	3	-	-	-	-	2	-	-
CO2	-	-	2	-	-	-	-	-	-	3	2	-	-	--	-	-	-
CO3	-	-	-	2	-	-	-	--	-	3	-	2	-	-	-	-	-
CO4	-	2	-	-	1	-	2	-	-	3	-	-	-	-	-	3	-
CO5	-	-	-	1	2	-	-	-	-	3	-	-	-	-	-		-
Total	2	3	2	3	3	-	2	-	-	15	2	2	-	-	-	5	-

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AR 424(C16) : STRUCTURAL DESIGN PROJECT

Periods / Week : 7
Periods / Semester : 126
Credits : 7
Internal Examinations : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Internal Exam : Viva - Voce
External Exam : Viva - Voce

TIME SCHEDULE

S. No.	Major Topics	No. of Periods	Weightage of Marks
			Internal Exam
1	Introduction to Structural Thesis	16	5
2	Literature Study, Desktop Study and Case Study	30	8
3	Theory & Methodology	30	12
4	Experimental Work/Model Work	40	15
5	Result and Conclusion	10	10
	Total	**126**	**50**

COURSE OVERVIEW:

To Understand the Structural design concepts of multistoried buildings.

COURSE OBJECTIVES:

To provide knowledge in Structural behavior concepts and designs of RCC and Steel.

EXPECTED SKILLS / KNOWLEDGE TRANSFERRED: To Understand the Basics in structures and the importance and its role in the Construction industry, Designing and Developing of a structural detailing required for an architect to be well equipped in the Competitive Industry.

COURSE LEARNING OBJECTIVES:

1) To understand the fundamentals structural planning.
2) To understand the importance of failure modes in buildings.
3) To be able to mark up the structural framing.

4) To gain knowledge in calculating and assigning various loads as per IS codes to the elements in the buildings
5) To understand the analysis method for extracting the ultimate effects of loads on various elements.
6) To provide students with the skills and knowledge needed to design, detail and execute the construction of a building.

COURSEOUTCOMES: At the end of the course, the student will be able to

CO1	To demonstrate a comprehensive understanding of the fundamentals of structural framing in a building.
CO2	To understand the application of loads on the structure.
CO3	To evaluate different types of support conditions and failure modes in structural and analyze the members.
CO4	To understand and apply the specific guidelines given in the code for design of structural elements.
CO5	To show the detailing of all the structural elements.

Design Project should address the following Structural elements:

- Foundations
- Beams
- Columns
- Slabs
- Steel sections
- Frames
- G+1 Structures, Multistoried Buildings

Each student is expected to prepare a structural design thesis which includes any structure either in RCC/Steel which would contain the design of all the basic structural elements of a structure based on the Literature work under an approved guide/adviser by the department.

The Thesis shall comprise of Structural design for a component of Structural Elements the Component of Design for which structural design is to be provided will be chosen with the help of faculty in charge of structural design subject. The student will also be required to produce a project feasibility report for the specific design undertaken for the Structural Project.

Thesis should reflect the knowledge gained from the course learnt in the previous semesters

The particulars of schedule, content, presentation, format etc., is to be decided by the department, from time to time and shall be strictly followed. At the end of the semester, each student is expected to submit all original Reports / drawings prepared as per the department's specifications. Three copies of the report in the specified format along with a model submitted to the department, after obtaining the approval of the respective guides / advisers.

The department shall schedule the final viva-voce, at its convenience, only after the receipt of the thesis submission by a student. For End exam, viva-voce is to be conducted by a jury comprising of an external examiner, one internal examiner and head of the department or his nominee.

For the structural design project and Project Feasibility report a separate External Viva voce will be conducted. A total of 50 internal Marks and 50 external marks shall be allotted for the same out of total 100 marks.

Note: In end exam which is a viva-voce the students have to present the entire semester work for assessment. After submission of the report the department at its convenience will arrange for the conduct of the viva-voce examination.

COURSE OUTCOMES VS PO_S AND PSO_SMAPPING:

Course Out Comes AR 424 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	1	4	-	-	1	-	2	1	1	1	1	1	1	1	1	1
CO2	-	-	4	-	-	1	-	1	1	-	1	1	2	1	1	1	1
CO3	-	-	4	-	-	1	-	1	1	-	1	1	2	1	1	1	1
CO4	-	-	4	-	-	1	-	1	1	-	1	1	2	1	1	1	1
CO5	3	-	-	-	-	1	-	-	1	1	1	1	2	1	1	1	1
Total	4	1	16	0	0	5	0	5	5	2	5	5	9	5	5	5	5

AR 425(C16): URBAN DESIGN STUDIO

Studio/Drawing Periods/Week : 9
Studio/Drawing Periods/Semester : 162
Credits : 9
Internal Assignments : 200 Marks
External Examinations : 200 Marks
Total Marks : 400 Marks
External Jury : Viva Voce

TIME SCHEDULE

S. No.	Major Topics	No. of Periods	Weightage of Internal Marks	Viva-Voce Weightage of External Marks
			Internal Review	External Jury
1	Unit – I Introduction to Urban Design	18	20	20
2	Unit – II Site Selection and Documentation	63	70	80
3	Unit – III Site analysis and Interventions	81	90	100
4	Attendance		20	
	TOTAL	**162**	**200**	**200**

Note: (a) For assessment:

1) Sufficient theoretical inputs need to be given highlighting the norms, standards and design parameters.
2) The students have to identify an Urban area of minimum 1.5 KM in radius.
3) Overall internal submission should have site documentation, analysis, ward level strategies and detailed drawings of individual interventions.
4) The students need to produce existing physical scale model at the time of documentation.
5) The final Design proposal submission shall necessarily include a physical scale model and digital model/walkthrough.

6) The students must submit the entire portfolio for the final internal submission after which they can attend the external end exam.
7) In the end exam which is viva voce, the students are required to present the entire semester work.

COURSE OVERVIEW:

To enable student understand how architecture is related to urban design in planning process; how cities have aesthetic and visual impacts, analysis of various implementation techniques and involving public in the process.

EXPECOURSE LEARNING OBJECTIVES:

- To create an understanding of urbanism and urban morphology as rising from various forces through history. .
- To introduce the components of the modern city and their interdependencies.
- To introduce the scope and nature of urban design as a discipline.
- To create awareness of contemporary urban issues and how they are addressed.
- To give exposure to ways of perceiving, documenting and analysing cities.

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COURSE OUTCOMES:

CO1	Students should have a thorough understanding of the concepts and principles of urban design, including the history, theories, and approaches used in urban design..
CO2	Students should be able to analyze urban spaces, including streets, public spaces, and buildings, using different analytical methods to identify the strengths and weaknesses of a particular space.
CO3	Students should be able to evaluate the impact of design proposals on different aspects of urban life, such as social, cultural, economic, and environmental impacts.
CO4	Students should be able to use different technology and software tools to support their design work, such as computer-aided design (CAD), and 3D modeling software.
CO5	Students should be able to collaborate with different stakeholders, including community members, city officials, and other design professionals, to create design proposals that are responsive to local needs and interests.

COURSE CONTENTS:

Unit I:

Introduction to Urban Design Enable student understand the meaning, definition and relationship between Architecture and Urban design. Basic theories and techniques in Urban Design Surveying methods and techniques: conducting and urban design survey. Learning Outcomes: This unit gives the basic idea of Urban design and its relation with Architecture.

Unit II:

Site Selection and Documentation Critically evaluate how spaces have been organized and articulated in cities documentation and analytical methodologies which would include user group analysis, direct involvement with stakeholders, mapping. Learning Outcomes: Students will learn the criteria for site selection and process of documentation.

UNIT III :

Site analysis and Interventions– Detailed analysis of the delineated area.Strategies at concept level to be drawn as a group at ward level.Students are expected to identify their individual study area for demonstrating their proposals with respect to their inferences drawn from their initial studies that are conducted at ward level.Diagnose implications of the recommended interventions. Urban design policies – Formulation of policies for various components like landscape, infrastructure and built forms.

REFERENCE BOOKS:

1) **Alexander, Christopher**. Pattern language: Towns, Buildings, Construction. Oxford University Press, New York.
2) **Newman, Oscar** and Others. Defensible space: People and Design in the Violent City. Architectural Press, London, 1972.
3) **Bacon, N. Edmund.** Design of Cities. Penguin Books, New York, 1976.
4) **Moughtin, Cliff and others**. Urban Design: Ornament and Decoration. ButterworthHeinemann, London, 1995.
5) **Moughtin, Cliff**. Urban Design street and square.
6) **Sprelregen, Paul.** Urban Design: The Architecture of Towns and Cities.
7) **Lynch, Kwin**, The Image of the City Cambridge mass:MIT press, 1965.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes ; AR 425(C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	3	2	1	3	1	2	-	-	-	1	-	-	1	-	-	3
CO2	1	2	1	3	2		3	-	-	-	-	3	-	1	-	-	3
CO3	2	2	1	3	1	3	3	-	1	3	1	-	1	1	-	-	3
CO4	1	1		1		3	1	-	-	-	-	-	-	-	-	-	3
CO5	2	3	2	3	1	2	1	1	-	-	-	1	2	1	-	-	3
Total	07	11	6	11	07	09	10	1	1	3	02	4	3	04	-	-	15

AR 511(C16): PRACTICAL TRAINING

Training Periods/Week : **40**
Training Periods/Semester : **640**
Credits : **40**
Internal Assignments : **200 Marks**
External Examinations : **200 Marks**
Total Marks : **400 Marks**
External Jury : **Viva Voce**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Internal Marks	Viva voce
				Weightage of External Marks
			Internal review	External jury
1.	Mentor Evaluation	640	100	200
2.	Monthly Reports	–	25	–
3.	Interim Evaluation	–	25	–
4.	Internal Viva	–	50	–
	Total:	**640**	**200**	**200**

Note: (a) For assessment:

1) The internal assessment shall be evaluated at the end of fifth year first semester Semester and shall be conducted by the faculty deputed by the department in the institute.
2) The period of Internship shall be not less than 16 weeks in the semester.
3) For practical training in fifth year first semester shall be evaluated for 400 marks.
4) Among 400 marks, 200 marks are allotted to internal evaluation and 200 marks for external evaluation.
5) In internal evaluation out of 200 marks 100 marks are evaluated by the mentor where internship was carried for the work done. In remaining 100 marks, 25 marks are allotted to the interim evaluation/feedback report given by the faculty who visits the firm where student is working, 25 marks are allotted to the monthly reports sent by the student and remaining 50 marks are allotted to internal viva voce conducted by head and two senior faculty members.

6) The external evaluation be evaluated for the detailed report and drawings prepared during practical Training by students will at a viva-voce by a jury consisting of one external, one internal and head of the department or his nominee.
7) Inspection by an officer not below the rank of Assistant Professor for the work done by the student trainee during his/her practical training.
8) Only two students are allowed to work in one office.
9) Students must get pre-approval of the firm from the Architect who has minimum 5 years of experience after Council of Architecture registration and submit the same in college prior to joining.

COURSE OVERVIEW:

Internship for a period of not less than 16 weeks in the semester.

COURSE OBJECTIVES:

- To provide experience in Architectural Practice.
- To let the student learn the skills required for an architect to grow into a complete professional.
- Orientation under an architect that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings.
- Development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.
- To facilitate the understanding of the evolution of an architectural project from design to execution.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understanding Architecture as a profession and working on architectural design projects in diversified firms of different specialization and specification.
CO 2	Relating the difference between study and practical knowledge, working with different teams and collaboration of types of works required for technical and design knowledge.
CO 3	Understanding the importance of using design tools used in making presentation drawing's which would help in achieving good values and learning ethical practices under an experienced firm.

COURSE CONTENTS:

Every student must work in an Architect's Office as a full-time trainee for a period of 16 calendar weeks in approximate 4 months (excluding Viva-voce) from the date of commencement of training. The Chief Architect in the firm should be registered with the Council of Architecture and have a minimum of five years of practical/professional experience after her/his Council registration. The student should involve herself/himself in various aspects of work in an office like working drawings, presentation drawings, quantity and cost estimation, site supervision, municipal drawings, etc.

Note*:* Attendance in Practical Training should not be less than 90%. No condonation procedures are applicable. Detailed instructions given by the University regarding the training, the frequency of reporting to the department, etc. will be issued at the end of the eighth semester, which the student must strictly follow.

Inspection by an officer not below the rank of Assistant Professor for the work done by the student trainee during his/her practical training:

i. In the middle of the practical training /internship one or two faculty members must visit the architecture firms within the country where student is doing their training and must submit feedback report. Feedback report carries 25% of weightage in total marks allotted to internal viva voce exam. If they are outside the country interaction can be carried by video conference.

ii. Each student must submit monthly report containing number of days undergone training and a brief note on work progress. These monthly reports are given 25% of weightage in total marks allotted to internal viva voce examination.

Submission:

After completion of training, every student will have to submit a detailed report with a set of drawings of the projects on which she/he has worked during the practical training period.

After submission of the report the department at its convenience will arrange for the conduct of the viva-voce examination.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR511(C 16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	3	3	3	2	2	-	1	1	-	1	-	2	-	-	-	-	3
CO3	3	3	2	2	2	1	1	1	1	-	1	2	-	-	1	-	3
TOTAL	09	09	09	05	06	02	04	04	01	03	02	07	01	01	2	1	9

AR 521(C16) : DESIGN THESIS

Studio/Drawing Periods/Week : 22
Studio/Drawing Periods/Semester : 396
Credits : 22
Internal Assignments : 200 Marks
External Examinations : 200 Marks
Total Marks : 400 Marks
External Jury : Viva Voce

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Internal Marks	Viva voce Weightage of External Marks
			Internal review	External jury
1.	Primary & Secondary studies	44	30	30
2.	Site study & analysis	44	30	30
3.	Design development & details	286	100	100
4.	Physical Model	22	20	40
5.	Attendance		20	
	Total:	**396**	**200**	**200**

Note: (a) For assessment:

1) Each student is expected to submit all original drawings prepared as per the department's specifications.
2) Three copies of the report in the specified format along with a model submitted to the department, after obtaining the approval of the respective guides / advisers.
3) Basic physical model must submitted for internal assessment and detailed model must be submitted for external Viva-voce
4) At the end, viva-voce is to be conducted by a jury comprising of an external examiner, one internal examiner and head of the department or his nominee.

COURSE OVERVIEW:

Thesis should reflect the knowledge gained from all the courses undertaken by the student in all the previous semesters.

COURSE LEARNING OBJECTIVES:

- To understand Design vocabulary, enhancement and sensitization in design preparation and its relation to individual design project.
- To explore Architecture as responding to various aspects such as contextual, social, economic, cultural and political issues.
- To develop the design according to the user requirements with implementing innovation and aesthetics.
- To design, keeping in mind the standard norms followed for each type of building.

1) At the end of the course work, the students would be able to understand about the importance of designing with norms and trying to solve various design issues.
2) The students will develop knowledge of the preparation of drawings for various building typologies.
3) Learning and understanding the design response to various trends in architecture.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To develop the design thesis according to the user requirements with implementing function, innovation and aesthetics.
CO 2	Analyze the different methods and procedures used in practical development of design to attain solutions to simple and complex design problems.
CO 3	To explore Architecture as responding to various aspects such as contextual, social, economic, cultural and Standards issues.
CO 4	Learning and understanding the design response to various aspects like climate, Building services, barrier-free environment in architecture.
CO 5	To design and present the technical requirements of design project using software tools for drawing representation.
CO 6	Study of the physical, socio economic and cultural aspects of a selected place to Understand the settlement pattern and amenities that are existing or required.

COURSE CONTENTS:

Each student is expected to prepare a design thesis based on the preliminary work undertaken in the Dissertation, under an approved guide/adviser by the department.

The design Thesis shall comprise of Architectural Design proposals, Structural design for a component of architectural design proposal. The Component of Design for which structural design is to be provided will be chosen with the help of faculty in charge of structural design subject. The student will also be required to produce a project feasibility report for the specific design undertaken for the design thesis.

Thesis should reflect the knowledge gained from the course learnt in the previous semesters

The particulars of schedule, content, presentation, format etc., is to be decided by the department, from time to time and shall be strictly followed. The performance sheet submitted by the advisor and the thesis committee should be the basis for allowing the student to appear for the final viva- -voce.

Internal submission:

1. Students need to submit all the drawings as per specifications.
2. Students need to submit three copies of the report in the specified format along with a model submitted to the department, after obtaining the approval of the respective guides / advisers.
3. Basic physical model must submitted for internal assessment.

COURSREFERENCE BOOKS:

1) **Mukhi, H.R.** Technical Report Writing: Specially prepared for Technical and Competitive Examinations, New Delhi: Satya Prakashan, 2000.
2) **Barrass, Robert.** Writing At Work \b a guide to better writing in administration, business and management, London: Routledge, 2003.
3) **Seely, John.** The Oxford guide to effective writing and speaking, 2nd ed., Oxford ; New York : Oxford University Press, 2005.
4) **Jo Ray McCuen, Anthony Winkler.** Readings for writers, 9th ed., Fort Worth : Harcourt Brace College Publishers, 1998.
5) **Treece, Malra.** Effective reports, 2nd ed., Boston: Allyn and Bacon, 1985.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR 521(C16)	Program Outcomes Po's													Program-Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	1	1	1	1	1	1	-	1	2	1	1	1	-	-
CO2	1	1	3	1	-	3	1	1	1	-	1	1	1	1	3	1	1
CO3	-	2	-	1	3	-	2	2	1	-	1	-	-	3	-	-	2
CO4	2	1	-	1	1	1	1	-	-	-	1	2	-	1	2	-	1
CO5	1	1	-	3	1	3	-	1	-	-	1	1	-	1	-	1	1
CO6	-	1	-	1	3	-	3	1	-	-	1	1	1	2	-	-	2
Total	06	08	04	08	09	08	08	06	03	-	06	07	03	09	06	02	07

AR 522(C16) : PROFESSIONAL PRACTICE

Periods / Week	**:**	**3**
Periods / Semester	**:**	**54**
Credits	**:**	**3**
Internal Assignments &Mids.	**:**	**50 Marks**
External Examinations	**:**	**50 Marks**
Total Marks	**:**	**100 Marks**
Duration of Exam	**:**	**3 Hrs. (University Exam)**

TIME SCHEDULE

S. No.	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Architects role in society & Professional Ethics	12	10	1	1
2	Architects Duties & COA Regulations	10	10	1	1
3	Details on Contract, Arbitration, Easement rights	10	18	1	2
4	Preliminary knowledge on Registration, GST, COA on Architectural Education	12	18	1	2
5	Architects office, Role of Consultants, NBC & Fire prevention etc	10	18	1	2
	TOTAL	**54**	**74**	**5**	8

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course provides overview and specific conditions of COA regulations, Architects Act 1972 in Architectural practice.

COURSE LEARNING OBJECTIVES:

- To impart awareness and technicalities of code of conduct, and the significance of Architects Act 1972 in Professional Practice.
- To make the students confident on how he has to start consultancy service and in detail about Statutory Acts applicable from designing a project till completion.
- To let the student understand the challenges to be faced after completion of graduation as an architect.
- Detail studies about various aspects of the profession in real life as an Architect on his own as consultant or as an employee.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Understanding the control projects in architectural design. from start to finish to ensure high quality, innovative and functional design.
CO 2	Provide Essential for knowledge and skills in field communication and relationship skills ethical values, accountability's passion.
CO 3	Evaluating the level of performance with professional standards, in society and understanding the wellbeing of different people with diverse culture, maintaining communication between them.
CO 4	Understanding the Promotion of aesthetic, scientific and practical expertise, efficiency in the profession.
CO 5	Learning the importance of professional ethics like honesty, trustworthiness, transparency, confidentially, accountability objectivity, respect, obedience to law and loyalty and economy.

COURSE CONTENTS:

Unit I

Role and responsibility of architect in society; architectural profession as compared to others professions; difference between profession and business; architect's registration, COA, IIA and other organizations related to architectural profession.

Architects approach to works; ways of getting works; types of works, works partly executed by other architect; various precautions to be taken before taking up the work; conditions of engagement between the architect and client; commencement of work.

Learning Outcomes: The unit makes the student to understand Architecture Profession in detail to start private practice or in employment.

Unit II

Architect's duties; drawings to be prepared; Architects relation with other parties connected with works such as client, contractor, sub-contractors, consultants, municipal and public authorities.

IIA Code professional conduct; COA Architects Professional conduct Regulations 1989 Scale of charges; units and mode of measurements - clerk of work and his duties; Inspection of work: during 'construction; certificate of payment to contractor; bill of quantities; Schedule of rates, tenders; public, limited and negotiated tender documents and allied formalities.

Learning Outcomes: Student can learn about how to deal with projects from planning to execution as per COA & IIA norms.

Unit III

Contracts; types of contracts such as item rate, lumpsum, cost plus percentage etc.

General principles of Indian contract Act; Building contracts, conditions and forms of contract, study of standard contract of the Indian Institute of Architects. Administration of contract. Principle of Arbitration, Indian Arbitration act 1940, Powers and duties of arbitrators, revoking authority; umpire, award cost fixedfee, cost with penalty, labour day work, piece work Daily

Easement: definition; various types of easements; Dominant, and servient owners; essential conditions for enjoyment of easement; Fire insurance's definition, cover note; insurance for new work and additions; insurable value of property, claim fordamage due to fire**.** Insurance of completed and pied building.

Learning Outcomes: Student will learn how to execute project from calling tenders to completion including Arbitration, Easement rights, Insurances etc.

Unit IV

Preliminary knowledge of transfer of property Act; registration, stamp duty under registration and Govt. Power.Income tax, wealth, land acquisition Acts; general information about land acquisition procedures.

Accidents during progress of work and after completion, damage to persons and properties affected; workmen's compensation Act with regards to the affected persons and properties.

Consumer protection Act and related acts on Architects.

(Act 20 of 1942) Architects Act 1972; Professional Practice Regulation and architectural education regulations under the Architects Act.

Learning Outcomes: Here student learns about various Statutory regulations & Acts in property dealings from registration to acquisitions and acts on workman's compensation in the case of affected persons etc.

Unit V

Types of offices for architectural practice; staff structure; filing of records; correspondence and drawings; maintenance of accounts; presentations in meetings, recording minutes of meeting.A small report to be prepared by each student after visiting an architect's office.

Role of consultants and Co-ordination between different consultants on a big project.

Study of building byelaws to enable to design and prepare drawings for submission to concerned bodies.National building code, Fire prevention and safety measures.

Learning Outcomes: Here students learn about how to run Architectural Consultancy office & its framework in detail.

COURSREFERENCE BOOKS:

1) **Banerjee, D.N.**Principles and Practice of Valuation, 5th ed. Eastern Law House, Calcutta, 1998.
2) **Dalton, J. Patrick.** Land Law, 4th ed. Pitman Pub., London, 1996.
3) **Indian Institute of Architects.**H.B.Professional Practice.The Architects Pub.Bombay.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR522(C 16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	3	3	3	2	2	2	1	1	1	1	-	2	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	1	-	1	2	-	-	1	-	3
CO4	3	2	2	2	2	1	1	3	1	-	1	1	-	1	-	-	3
CO5	3	3	2	2	1	2	1	2	-	-	-	3	-	1	-	1	3
Total	16	14	14	12	10	08	09	10	04	03	02	12	02	03	02	03	15

AR 523.1(C16) : ARCHITECTURAL JOURNALISM (ELECTIVE-II)

Periods / Week : **4**
Periods / Semester : **72**
Credits : **4**
Internal Assignments & Mids. : **50 Marks**
External Examinations : **50 Marks**
Total Marks : **100 Marks**
Duration of Exam : **3Hrs (University Exam)**

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1.	Unit – I Introduction to journalism	14	10	1	1
2.	Unit – II Photo Journalism	15	18	1	2
3.	Unit – III Development of writing skills	15	18	1	2
4.	Unit – IV Regional, National and International discussion forums	14	18	1	2
5.	Unit – V Interviewing techniques	14	10	1	1
Total:		72	74	5	8

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The Course prepares ground for the students to gain an understanding into the fundamental issues in architectural journalism and develop the skill to create Articles/presentation capturing the essence through the writing and photography.

COURSE LEARNING OBJECTIVES:

- To develop an understanding on writing skills and their application into architecture.
- Introduction of articles and blog writings in architecture.
- Study and understand research and report writing skills.
- Study of photo journalism and its use as social documentation.
- To make the students understand the discussion forums in architecture like interviewing moderating and presentation.

1) At the end of the course work, the students would be able to understand about the importance of research and writing in architecture.
2) The students will develop knowledge of the preparation of reports, blogs and research publications for various architectural topics or issues.
3) Learning and understanding importance of documentation in design through detailed study on photojournalism.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	Enable students to ability to use journalism media in architecture to establish a strong fundamental explanation towards the key concepts like research, writing and photography.
CO 2	To conduct in depth analysis of issues and challenges in architecture through various skills in journalism like research, photography and report writing.
CO 3	Develop report writing and photo documentation that explore Architecture as responding to various aspects such as contextual, social, economic, cultural and Standards issues.
CO 4	Learning and understanding the physical and physiological aspects through research studies making detailed reports and effective presentations and law-legal boundaries, issues in terms of practices.
CO 5	To review and research complex design problems related to architecture through journalism skills to satisfy function, aesthetics and technical requirements.
CO 6	To illustrate various issues of architecture through effective writing and presentation skills and know the techniques used in conducting interviews, panel discussions and any kind of information investigation in architecture.

COURSE CONTENTS:

Unit I

Introduction to journalism - key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism - Journalism skills: research, reporting, writing, editing, photography, columnists, public relationships, criticism.

Unit II

Photo Journalism - Brief History - Photographs as social Documentaries - Birth of modern Photo Journalism since 1950s. Introduction to software needed in journalism and photography, video coverage, walk-through of buildings, production of contemporary architectural journalism.

- Visual survey - EDFAT methods in using the camera - Equipment required for Photo Journalism - the picture Editor - Editing practices, creating drama - Photo editing Approach to Photo Journalism - Design elements: Page make -up - Layout - color scheme - Font - Blurb - Pictures - Ads etc- Other magazines - Documenting of Places - Rural- Urban - Public relations.

Unit III

Development of writing skills: Usage of language and Vocabulary and grammar- introduction to methodology of writing essays, news writing, precise writing, Documentary-evolution of the word document-methods and techniques. Writing in architectural blogs; listening comprehension,

Analyze talks and information gathered .Understanding the individual demands in the context of newspapers, radio, film, and television. Role of the Editor - Editing of Articles, Features and other stories - Editing for online newspaper and magazines - Text preparation, Mode of presentation, Standards and Guidelines for documentation, Code of ethics,

Unit IV

Regional, National and International discussion forums - Discussions on topics needed in an architectural journal and current issues - types of journals, works of key architectural journalists. 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.

Unit V

Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking. Awards for Architectural Journalism and some of the important recipients. People journalism and law- legal boundaries-issues libel and invasions of privacy-ethics-the photo journalist on scene

Assignments should include an article based on ability to originate, plan, research, present and produce a piece of architectural journalism. The techniques and processes used in the production should be identified by the student.

COURSREFERENCE BOOKS:

1) Kopelow, Gerry. How to photograph buildings and interiors, 3rd ed. New York: Princeton Architectural Press, 2002.
2) De Mare, Eric Samuel. Architectural photography, London: Batsford, 1975.
3) Busch, Akiko. The photography of architecture: twelve views, New York: Van Nostrand Reinhold Co., 1987.
4) Mehta, Ashvin. Happenings: \b a journal of luminous moments, Vapi, Gujarat: Hindustan Inks, 2003.
5) Mohd, Al Asad. Architectural Criticism and Journalism
6) Sommer, Robert. Tom Wolfe on Modern Architecture
7) Edward Jay Friedlander and John Lee, "Feature Writing for Newspapers and Magazines", 4th edition, Longman, 2000.
8) Fuller, David & Waugh, Patricia eds., "The Arts and Sciences of Criticism", Oxford: Oxford University Press, 1999
9) Foust, James, Online Journalism,"Principles and Practices of News for the Web", Holcomb Hathaway Publishers, Scottsdale, AZ, 2005
10) M. Harris, "Professional Architectural Photography", Focal Press, 2001.
11) M. Harris, "Professional Interior Photography", Focal Press, 2002
12) Huckerby, Martin., The Net for Journalists: A Practical Guide to the Internet for Journalists in Developing Countries. UNESCO/Thomson Foundation/ Common wealth Broadcasting Association, 2005.
13) Ward, S. J. A. "Philosophical Foundations of Global Journalism Ethics." Journal of Mass Media Ethics., Vol. 20, No. 1, 3-21, 2005
14) .M . Heinrich, "Basics Architectural photography", BikhauserVerlag AG, 2008. 4. Gerry Kopelow, "Architectural Photography: the professional way", 2007

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Courses Out Comes AR 523.1(C-16)	Program Outcomes Po's													Program-Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	-	1	-	-	1	-	-	-	3	-	-	1	-	1	1	-
CO2	-	-	1	-	-	1	1	-	-	3	-	-	-	-	1	1	-
CO3	-	1	-	-	3	-	2	-	1	2	-	-	1	2	-	1	-
CO4	-	2	-	1	1	-	2	1	-	3	-	-	-	1	3	1	1
CO5	2	-	2	-	-	2	-	-	-	1	-	-	-	1	1	-	2
CO6	-	-	1	2	-	1	-	-	-	1	1	-	-	-	2	1	1
Total	03	03	05	03	04	05	05	01	01	13	01	-	02	04	08	05	04

AR523.2(C16) : FURNITURE AND PRODUCT DESIGN (Elective II)

Periods / Week : 4
Periods / Semester : 72
Credits : 4
Internal Assignments & Mids : 50 Marks
External Examinations : 50 Marks
Total Marks : 100 Marks
Duration of Exam : 3 Hrs (University Exam)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Furniture and product design – Introduction	16	18	1	2
2	Evolution of furniture and Classification based on social use	12	18	1	2
3	Basic Principles of Furniture and product design	10	10	1	1
4	Introduction of various manufacturing processes in Furniture and product design	12	10	1	1
5	Signage and Graphics In Furniture and product design	04	08	-	1
6	Detailed study involving the design aspects	18	10	1	1
Total:		**72**	**74**	**5**	**8**

Note:

1) Duration of examination is for 3 hours and the questions to be framed as per the given table above

2) Final exam question paper consists as follows:

(i) PART-A for 10 marks which consists 5 short questions all 5 to answer, no choice and each one carries 2 marks &

(ii). PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

The course provides a framework in understanding the Theoretical, historical functional and human issues of the subject.

COURSE LEARNING OBJECTIVES:

- To apply knowledge of historic furniture design styles accurately through the creation of furniture design.
- To use critical thinking in the Classification based on social use.
- To get the knowledge in Principles of universal design and ergonomic considerations.
- To demonstrate craftsmanship skills in the presentation of materials and they will get the knowledge in manufacturing processes.
- To implement knowledge in furniture and product design with regard to construction, materials and production.
- To understand the relationships between furniture – function – space, and product – function.
- To consider different materials, such as wood and metal, other new materials, and relate these to their own design.
- To find a personal approach in creative processes and communicate through their drawings and sketches.

COURSE OUTCOMES: At the end of the course, the student will be able to

CO 1	To analyze and apply the principles of design to furniture and product design, including form, function, aesthetics, and usability.
CO 2	To understand how furniture and products interact with human users, and be able to design products those are safe, comfortable, and easy to use.
CO 3	To understand the impact of furniture and product design on the environment, and be able to design products that are environmentally responsible and sustainable and ability to work effectively in teams, communicate their design ideas, and collaborate on projects.
CO 4	To generate a range of design concepts for furniture and products, and communicate these concepts through sketches, renderings, and prototypes.

CO 5	To understand the properties and characteristics of different materials commonly used in furniture and product design, as well as the manufacturing processes used to produce them.
CO 6	To develop proficiency in using software tools such as 3D modeling software, CAD, and Adobe Creative Suite.

Unit I

Furniture and product design – introduction:

Understanding of the functional and formal issues in design – study and evaluation of popular dictums such as "Form follows function", form and function are one", "Less is more", "God is in details" etc.

Evaluation of visual design for functional objects.

Gestalt theory of design: Law of closure, law of proximity, law of continuity etc.

Unit II

Evolution of furniture and classification based on social use:

Evolution of furniture through ages till present day.

Classification based on social use.

Hospitality furniture, institutional furniture, multifunctional furniture, office furniture, recreational furniture, Residential furniture, retail furniture.

Unit III

Basic Principles of Furniture and product design:

Human factors engineering and Ergonomic considerations in furniture and product design.

Principles of Universal Design and their application in furniture and product design.

Unit IV

Introduction of various manufacturing processes in Furniture and product design:

An introduction of various manufacturing processes most frequently adopted in furniture and product design such as,

- Injection Moulding.
- investment casting.
- Sheet metal work.
- Die-casting.
- blow-moulding.
- vacuum – forming.

Unit V

Signage and Graphics in Furniture and product design:

Signage and Graphics – Environmental graphics: signage categories and materials.

Unit VI

Detailed study involving the design aspects:

A detailed study involving the design aspects of any on of the following:

- Luminaire design: for hotels, exhibition galleries , convention centers.
- Furniture design: space saving furniture with multipurpose activities.
- Lifestyle accessories, a piece of furniture, Point of Purchase design.

Submission issues to be addressed:

The process deriving from specified criteria is just as important as the result achieved from the practical work at the end of the course.

- Individual work in the form of drawings and other documentation.
- Prototype of a piece of furniture or a product.
- Group discussion on the work.

All the above points should be included with detailed report and drawings for any of the given project.

REFERENCES BOOKS:

1) **Héctor Roqueta.** Product design, London: te Neues, 2002.
2) **Morley, John.** The history of furniture: twenty-five centuries of style and design in the Western tradition, Boston: Little, Brown and Company, 1999.
3) **Aronson, Joseph.** The Encyclopedia of Furniture, 6th printing, New York: Crown Pub. 1944.
4) **Saville, Laurel.** Design secrets: furniture, Gloucester, Mass. : Rockport Publishers, 2006.
5) **Datschefski, Edwin.** The total beauty of sustainable products, Hove: Rotovision, 2001.
6) **Papanek, Victor J.** The green imperative: natural design for the real world, New York: Thames and Hudson, 1995.
7) **Jim postell.** Furniture design:2007.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR 523.2 (C16)	Program Outcomes Pos													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	-	-	1	-	-	-	1	-	-	1	2	2	2	2
CO2	1	1	1	-	-	1	2	1	-	1	-	1	1	2	2	2	2
CO3	1	1	2	2	-	1	-	2	-	3	-	-	1	2	2	2	2
CO4	1	1	2	2	-	1	-	-	-	2	-	1	1	2	2	2	2
CO5	1	1	2	-	-	1	-	-	-	2	-	1	1	2	2	2	2
CO6	1	1	1	-	-	3	-	-	-	2	-	-	1	2	2	2	2
Total	6	6	9	4	-	8	2	3	-	11	-	3	6	12	12	12	12

AR 523.3(C16): DISASTER RESISTANT ARCHITECTURE (ELECTIVE-II)

Studio Periods/Week :3
Studio Periods / Semester :54
Credits :3
Internal Assignments & Mids :50 Marks
External Examinations :50 Marks
Total Marks :100 Marks
Duration of Exam :3 Hrs. (External)

TIME SCHEDULE

S. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Questions
			End Exam	End Exam	End Exam
1	Unit–I (Introduction to Disaster Management)	8	8	-	1
2.	Unit – II (Introduction to Natural Disasters)	10	18	1	2
3.	Unit – III (Theory of Vibrations)	10	10	1	1
4.	Unit – VI (Design and Retrofitting of Buildings for Earthquake resistance)	10	18	1	2
5.	Unit – V (Construction Quality Control)	8	10	1	1
6.	Unit – VI (Case studies of natural disasters in India)	8	10	1	1
	Total:	**54**	**74**	**5**	**8**

Note: Final exam question paper consists as follows:

1) PART-A for 10 marks which consists 5 short questions all 5 to answer no choice and each one carries 2 marks &

2) PART-B for 40 marks which consists 8 essay questions out of which 5 to answer (3 are choice) and each carries 8 marks.

COURSE OVERVIEW:

This course introduces and explains causes of disaster and different disaster resistant methods of construction

COURSE LEARNING OBJECTIVES:

- To introduce the students to an overview of major natural disasters and the management, disaster management cycle.
- To explain the Causes and impacts of natural calamities like earthquakes, cyclones, floods, droughts, climate change, sea level rise and adverse impacts of illumination etc.
- To gain an understanding of seismic activities and retrofitting of earthquake affected buildings.
- To understand Sequences of Construction for disaster resistance.
- Case studies of various natural disasters in the India.

COURSE OUTCOMES:

CO 1	Understand about ecosystem and causes of climate change due to various factors. And relate it to architectural design, bringing in solution to complex problems.
CO 2	Understand about the effects of natural calamities and concepts of Seismology, structural aspects in buildings and their problems, causes and occurrence factors of various disasters and effect on the environment
CO 3	Evaluate and analyse about Special effects on different structures, their effect on the building envelope, rehabilitation for different disasters and solutions for people affected.
CO 4	Understand about the importance of studying IS codes for disaster resistance in various buildings, rules to be followed while construction.
CO 5	Analyse and understand about the importance of studying about quality control and critical check points in buildings for checking earthquake resistance.
CO6	Understand different concepts in design and make a Comparative analysis through research and case study of different types of disaster and mitigation measures taken for people according to economy and proper planning .

Unit I

Introduction to Disaster Management: Basic understanding of fragile Eco-systems and factors that cause global climatic changes. Overview of major natural disasters, design and planning solutions for disaster mitigation, organizational and management aspects.

Learning Outcomes:

The students will be able to understand about ecosystem and causes of climate change due to various factors.

Unit II

Introduction to Natural Disasters: Understanding the effects of natural calamities such as Climate changes, global sea rise, coastal erosion, environmental degradation, floods, tropical cyclones, earthquakes, landslides, forest fires, draughts and Tsunami.

Elementary Seismology: Occurrence of earthquake 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. Seismological Instruments: Seismograph, Accelerograph, Seismoscope / Multi SAR.

Learning Outcomes:

The students will be able to understand about the effects of natural calamities and concepts of Seismology, causes and occurrence factors.

Unit III

Theory of Vibrations:

Single degree undamped and damped systems, resonance, response to earthquakes, elastic response, concepts of response spectrum. Flexibility of long and short period structures. Special Aspects: - Torsion, appendages, staircases, adjacency, pounding; Contemporary international approaches.

Learning Outcomes:

The students will be able to understand about Special effects of long and short period structures.

Unit IV

Design and Retrofitting of Buildings for Earthquake resistance: Design, construction and detailing of buildings, materials and methods to be adopted for earthquake resistant buildings and retrofitting of earthquake affected buildings.

Structural Detailing: Innovations and Selection of appropriate materials; IS Code provisions for the buildings:-IS:1893-2002, IS:4326-1993; Seismic Designs and Detailing of RC and Steel Buildings: IS: 1893 – 2002; IS: 13920 – 1993; IS: 456 – 2000; IS: 800 – 2004; Special reinforcing and connection details in structural drawings.

Learning Outcomes:

The students will be able to understand about the importance of studying IS codes for earthquake resistant buildings.

Unit V

Construction Quality Control:

Sequences of Construction: Good supervision practices, Critical check points and certification at certain stages, reporting, maintenance of records, testing.

Learning Outcomes:

The students will be able to understand about the importance of studying about quality control and critical check points in buildings for checking earthquake resistance.

Unit VI

Case studies of natural disasters in India: Earthquakes at Bhuj, Lattur, etc., Cyclones in coastal Andhra Pradesh& Orissa, Landslides in Uttarakhand, Nilgiris, Himachal etc, Floods in Bangladesh, and Droughts in Rajasthan & Tsunami in Tamil Nadu.

Learning Outcomes:

The students will be able to analyse and make a Comparative analysis of of different types of disaster and mitigation measures for them.

REFERENCE BOOKS:

1) **S.Rajagopal** - Problems of housing in cyclone prone areas - SERC, Vol.2, Chennai, 1980
2) **Office of the UN Disaster Relief Coordinator** - Disaster prevention and mitigation, Vol 12, Social and Sociological aspects - UNO, NY, 1986
3) **F.C.Cony et.al** - Issue and problems in the prevention of disaster and housing - A review of experiences from recent disasters - Appropriate reconstruction and training information centre, 1978S.Ramani, Disaster management - Advanced course on modern trends in housing - SERC, Vol 2, Chennai, 1980
4) **Abbott, L. Patidc.** Natural disasters.
5) **Arhold, Christopher and others.** Building configuration and Seismic Design.
6) **National Geographic.** Restless Earth: Disaster of nature.
7) **Singh, P.P. and Sharma, Sandhir.** Modern dictionary of natural disasters.

COURSE OUTCOMES VS PO'S AND PSO'S MAPPING:

Course Out Comes AR523.3(C16)	Program Outcomes Po's													Program Specific Outcomes PSOs			
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	2	1	2	2	-	2	-	3	1	1	1	-	3
CO2	1	3	3	2	2	-	1	1	-	1	-	2	-	-	-	-	3
CO3	2	3	2	2	2	1	1	1	-	-	1	2	-	-	1	-	3
CO4	3	2	2	2	2	1	1	3	-	-	1	1	-	1	-	-	3
CO5	2	3	2	2	1	2	1	2	-	-	-	3	-	1	-	1	3
CO6	3	2	-	3	1	-	3	1	-	-	-	1	1	-	-	1	-
Total	14	18	12	09	09	05	06	11	01	03	02	13	02	03	02	03	15

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