



RAMAIAH
Institute of Technology

CURRICULUM

for the Academic year 2019 – 2020

SCHOOL OF ARCHITECTURE

V & VI Semester B. ARCH.

RAMAIAH INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)

Bangalore – 560054.

About the Institute:

Ramaiah Institute of Technology (RIT) (formerly known as M. S. Ramaiah Institute of Technology) is a self-financing institution established in Bangalore in the year 1962 by the industrialist and philanthropist, Late Dr. M S Ramaiah. The institute is accredited with “A” grade by NAAC in 2014 and all engineering departments offering bachelor degree programs have been accredited by NBA. RIT is one of the few institutes with prescribed faculty student ratio and achieves excellent academic results. The institute was a participant of the Technical Education Quality Improvement Program (TEQIP), an initiative of the Government of India. All the departments have competent faculty, with 100% of them being postgraduates or doctorates. Some of the distinguished features of RIT are: State of the art laboratories, individual computing facility to all faculty members. All research departments are active with sponsored projects and more than 304 scholars are pursuing PhD. The Centre for Advanced Training and Continuing Education (CATCE), and Entrepreneurship Development Cell (EDC) have been set up on campus. RIT has a strong Placement and Training department with a committed team, a good Mentoring/Proctorial system, a fully equipped Sports department, large air-conditioned library with over 1,35,427 books with subscription to more than 300 International and National Journals. The Digital Library subscribes to several online e-journals like IEEE, JET etc. RIT is a member of DELNET, and AICTE INDEST Consortium. RIT has a modern auditorium, several hi-tech conference halls and all are air-conditioned with video conferencing facilities. It has excellent hostel facilities for boys and girls. RIT Alumni have distinguished themselves by occupying high positions in India and abroad and are in touch with the institute through an active Alumni Association. RIT obtained Academic Autonomy for all its UG and PG programs in the year 2007. As per the National Institutional Ranking Framework, MHRD, Government of India, Ramaiah Institute of Technology has achieved 64th rank in 2019 among the top 100 engineering colleges across India.

SCHOOL OF ARCHITECTURE

Ramaiah Institute of Technology (RIT), Bangalore, is a leading institution offering undergraduate, post graduate and research programs in the areas of Engineering, Management and Architecture. The institute was established in the year 1962 under the aegis of Gokula Education Foundation. Its mission is to deliver Global quality technical education by nurturing a conducive learning environment for better tomorrow through continuous improvement and customization.

The School of architecture, RIT, Bangalore, was established in the year 1992. Since its establishment, the school has played a vital role in providing quality education. The Council of Architecture and AICTE has recognized this program.

The Mission of the school is to uphold RIT mission, thus provide quality education to the students and mould them to be excellent Architects with adequate management skills and noble human qualities.

Full time faculty members having postgraduate qualification from prestigious institutions in India and abroad are teaching in this school. Experienced and well respected practicing architects are invited to provide their experiences as visiting faculty. New milestones are continually being set and achieved. The synergy of the progressive management, committed faculty and students ensure in excellent academic results year after year. This is reflected in the high number of University ranks that are secured.

The School of Architecture is now autonomous (affiliated to VTU) providing scope for further improvement. The focus has been towards fostering novel concepts and solutions in Architectural design. The student's response is very encouraging and the school recognizes and appreciates such good students by awarding them. Many of the students after graduation have pursued higher studies in various universities in India and abroad. There is a good demand for the school graduates in the industry and is developing initiatives towards co-branding of the industry and the institution school. Many have started their own enterprise and architectural practice as well.

All this has been possible as a result of the efforts of the impeccable faculty of the school. The faculty is committed to the welfare and success of the students. The teachers of the school are also engaged in enhancing their knowledge and skills and many are engaged in research activities as well. The school has experts in specialized disciplines like Habitat Design, Product Design, Urban Design, Urban Planning, Landscape Architecture, Heritage Conservation and Interior Design. Faculties of the school also actively participate in National and International conferences and publish and present papers.

The school as part of consultancy started off with the maiden project to redevelop the RIT engineering college campus and is now involved in various campus designs.

VISION OF THE INSTITUTE

To be an Institution of International Eminence, renowned for imparting quality technical education, cutting edge research and innovation to meet global socio-economic needs

MISSION OF THE INSTITUTE

MSRIT shall meet the global socio-economic needs through

- Imparting quality technical education by nurturing a conducive learning environment through continuous improvement and customization
- Establishing research clusters in emerging areas in collaboration with globally reputed organizations
- Establishing innovative skills development, techno-entrepreneurial activities and consultancy for socio-economic needs

QUALITY POLICY

We at MS Ramaiah Institute of Technology strive to deliver comprehensive, continually enhanced, global quality technical and management education through an established Quality Management System complemented by the synergistic interaction of the stake holders concerned

VISION OF THE DEPARTMENT

To achieve and propagate high standards of excellence in architectural education.

MISSION OF THE DEPARTMENT

- The school's commitment is to prepare people to make a difference;
- To create an environment that shall foster the growth of intellectually capable, innovative and entrepreneurial professionals, who shall contribute to the growth of the society by adopting core values of learning exploration, rationality and enterprise; and
- To contribute effectively by developing a sustainable technical education system to meet the changing technological needs incorporating relevant social concerns and to build an environment to create and propagate innovative designs and technologies.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Use the knowledge and skills of Architecture to analyze the real life problems and interpret the results.
- PEO 2:** Effectively design, implement, improve and manage the integrated socio-technical systems.
- PEO 3:** Build and lead cross-functional teams, upholding the professional responsibilities and ethical values.
- PEO4:** Engage in continuing education and life-long learning to be competitive and enterprising.

PROGRAM SPECIFIC OUTCOMES (PSOs):-

- a. Apply knowledge and skills of arts and sciences to the various architectural scenarios.
- b. Design and develop projects based on function, form and analysis.
- c. Design and improve integrated systems of people, materials, information, facilities, and technology.
- d. Function as a member of a multi-disciplinary team.
- e. Identify, formulate and solve industrial requirements and problems.
- f. Understand and respect professional and ethical responsibility.
- g. Communicate effectively both orally and in writing.
- h. Understand the impact of design solutions in a global and societal context.
- i. Recognize the need for and an ability to engage in life-long learning.
- j. Have knowledge of contemporary issues in industrial and service sectors.
- k. Use updated techniques, skills and tools of architecture throughout their professional careers.
- l. Implement the concepts of project and construction management to satisfy customer expectations.

Curriculum breakdown structure:

The curriculum of Architecture program is so structured to include all the courses that together satisfy the requirements of the program specific criteria prescribed by the **Council of Architecture**. The Course code, Course title, the number of contact hours and the number of credits for each course are given in the following table. The courses are grouped in line with the major components of the curriculum namely: (i) Humanities and Social Sciences, (ii) Arts and Science, (iii) Basic Architecture and Engineering courses, (iv) Professional core courses, (v) Electives and (vi) Project and industry exposure/internship.

Breakup of Credits for B Arch Degree Curriculum. (I to X Semester)

Sem	HSS	AS	BAE	PCS	Electives	Project / Internship	Total Credits
I	1	7	6	11	-	-	25
II	-	8	6	11	-	-	25
III	-	6	8	11	-	-	25
IV	-	3	11	11	-	-	25
V	2	6	6	11	-	-	25
VI	2	-	12	11	-	-	25
VII	3	-	8	11	3	-	25
VIII	5	-	3	-	2	15	25
IX	-	-	-	-	-	25	25
X	-	-	-	-	-	25	25
Total	13	30	60	77	5	65	250

HSS	- Humanities and Social Sciences	- 13
AS	- Arts and Science	- 30
BAE	- Basic Architecture & Engineering	- 60
PCS	- Professional Core Subjects	- 77
Elective	- Professional Electives, relevant to the chosen specialization	- 05
Project / Internship	- Project Work and Internship in Architect's office	- 65

Board of Studies for the Term 2019-2020

- | | | |
|-----|-------------------------------|--------------------------|
| 1. | Prof. (Dr.) Pushpa Devanathan | Chairperson |
| 2. | Ar. Chitra Vishwanath | VTU Nominee |
| 3. | Ar. Vidyadhar S. Wodeyar | External Industry Expert |
| 4. | Ar. Ulhas Rane | External Industry Expert |
| 5. | Dr. Rama RS | Academician |
| 6. | Dr. Chidambara Swamy | Academician |
| 7. | Ar. Subbiah T S | Alumni |
| 8. | Prof. Vishwas Hittalmani | Member |
| 9. | Prof. (Dr.) Rajshekhar Rao | Member |
| 10. | Prof. (Dr.) Jotirmay Chari | Member |
| 11. | Dr. Rashmi Niranjana | Member |
| 12. | Dr. Monalisa Vyas | Member |
| 13. | Er. Vijayanand M | Member |

SCHOOL OF ARCHITECTURE

TEACHING STAFF

Sl No	Name	Qualification	Designation
1	Ar. Pushpa Devanathan	M.Arch., P.G.D.I.(PhD)	Professor & Head of Department
2	Ar. Vishwas Hittalmani	M Des	Professor
3	Ar. Rajshekhar Rao	M L Arch (PhD)	Professor & Head-M.Arch(Landscape Architecture)
4	Ar. Jotirmay Chari	M Arch (PhD)	Professor
5	Prof. Prasad G	M.L.Arch	Professor (Tenure Faculty)
6	Dr. Rashmi Niranjan	PhD , MFA (Fine arts)	Associate Professor
7	Dr. Monalisa	M Arch , PhD	Associate Professor
8	Ar. Surekha R	M.L Arch	Associate Professor
9	Ar. Lavanya Vikram	M.L Arch	Associate Professor
10	Ar. Sudha Kumari	M.Arch	Associate Professor
11	Ar. Meghana K Raj	M L Arch	Associate Professor
12	Ar. Tejaswini H	M. L.Arch	Associate Professor
13	Ar.Sudhir Chougule	M L Arch	Associate Professor (Tenure Faculty)
14	Ar. Mallika P V	P G – Urban Design	Associate Professor (Tenure Faculty)
15	Ar. Nikhil V Wodeyar	M L.Arch	Associate Professor(Tenure Faculty)
16	Er. Vijayanand M	M Tech (PhD)	Assistant Professor
17	Er. Aruna Gopal	BE	System Analyst
18	Ar. Shivdeepthi Reddy	M.Arch(Architectural Conservation)	Assistant Professor
19	Ar. Kriti Bhalla	B.Arch	Assistant Professor

20	Ar. Kanika Bansal	M.Arch(Environmental Planning)	Assistant Professor
21	Ar. Apoorva Lakshmi R	B.Arch	Assistant Professor
22	Ar. Aishwarya Yoganand	M.Sc(Sustainable Building Systems)	Assistant Professor
23	Ar. Divya Susanna Ebin	M Arch (Urban Design)	Assistant Professor
24	Ar. Yashas Hegde	M Arch (Urban Design)	Assistant Professor
25	Ar. Arpita Sarkar	M L.Arch	Assistant Professor
26	Ar. Jyotsna Rao J	M LArch	Assistant Professor
27	Ar. Ranjitha Govindaraj	M L.Arch	Assistant Professor
28	Ar. Reema Harish Gupta	M.Arch (Urban Design)	Assistant Professor
29	Ar. Trisha Sinha	M.Tech (Infrastructure systems)	Assistant Professor
30	Ar. Theju V Gowda	M Sc. Architecture	Assistant Professor
31	Ar. Akshata Shagoti	M.Arch	Assistant Professor
32	Ar. Amala Anna Jacob	M.Arch (Urban Design)	Assistant Professor
33	Ar. Meghana M	M.Arch (World Heritage Studies)	Assistant Professor
34	Ar. Sheethal B S	M.Arch (Regional Planning)	Assistant Professor

ADMINISTRATIVE STAFF

1	Mrs. Padmavathy. B	MBA	FDA
2	Mrs. Ambika	M Tech	Assistant Instructor
3	Mr. Nagesh B.L	Dip. in Mech.Engg.	Assistant Instructor

SUPPORT STAFF

1	Mr. Ramachandra Chari	Attender
2	Mr. Penchaliah	Attender

**SCHEME OF TEACHING & EXAMINATION OF V SEMESTER B. ARCH
ACADEMIC YEAR 2019- 2020**

2017 Batch			Teaching scheme per week			Examination scheme		CIE Marks	SEE Marks
Sl. no	Code	Subject	Lecture / Studio	Tutorial	Practical(Study Tour/ Case study)	Total	Exam		
1	AR 501	Architectural Design IV	6	0	1	7	SEE (Viva voce)	50	50
2	AR 502	Building Materials & Construction Technology V	3	0	1	4	SEE (Viva voce)	50	50
3	AR 503	Contemporary Architecture	3	0	0	3	SEE	50	50
4	AR 504	Sociology & Economics	2	0	0	2	SEE	50	50
5	AR 505	Architectural Structures V	3	0	0	3	SEE	50	50
6	AR 506	Building Services III	3	0	0	3	SEE	50	50
7	AR 507	Landscape Design	2	0	1	3	SEE	50	50
8	AR 508	Vacation Assignment and Study Tour	-	-	-	P/F	SEE (Viva voce)	100	
			22	0	3	25			

TW = TERM WORK CIE = CONTINUOUS INTERNAL EVALUATION

SEE = SEMESTER END EXAMINATION P = Pass F = Absent & fail

X = Eligible for Makeup examination

Evaluation Pattern : Marks allocation for SEE

Subject Code	Subject Name	Design	Drawing	Viva Voce	Elective / Educational Tour/Book Review
AR501	Architectural Design - IV	20	15	05	10

Subject Code	Subject Name	Portfolio	Viva
AR502	Building Materials & Construction Technology V	40	10

Subject Code	Subject Name	Portfolio	Viva
AR508	Vacation Assignment and Study Tour	80	20

- Note:-**
- Electives and Educational tours are part of Architectural design.
 - Literature survey will be a requirement for Architectural design study. Periodical review by an external jury for subjects going for viva voce.
 - National/International tours may be arranged during vacation to students, to study examples of good Architecture.
 - For all viva voce examinations one internal faculty and one external faculty will conduct the exam.
 - Portfolios have to be submitted on prescribed date for all the subjects on the date announced by the department for one year.
 - All students have to register on the first day at the beginning of the viva voce exam.
 - All students have to register on the first day of term work exams

**SCHEME OF TEACHING & EXAMINATION OF VI SEMESTER B. ARCH
ACADEMIC YEAR 2019- 2020**

2017 Batch			Teaching scheme per week			Examination scheme		CIE Marks	SEE Marks
Sl. no	Code	Subject	Lecture / Studio	Tutorial	Practical (Study Tour/ Case study)	Total	Exam		
1	AR 601	Architectural Design V	6	0	1	7	SEE (Viva voce)	50	50
2	AR 602	Building Materials & Construction Technology VI	3	0	1	4	SEE (Viva voce)	50	50
3	AR 603	Research Methodology	2	0	0	2	SEE	50	50
4	AR 604	Estimation & Costing	3	0	0	3	SEE	50	50
5	AR 605	Architectural Structures VI	3	0	0	3	SEE (Viva voce)	50	50
6	AR 606	Building Services IV	2	0	1	3	TW	50	50
7	AR 607	Sustainable / Environmental Design	2	0	0	2	TW	50	50
8	AR 608	Working Drawing	0	0	1	1	SEE (Viva voce)	50	50
			22	0	3	25			

TW = TERM WORK CIE = CONTINUOUS INTERNAL EVALUATION

SEE = SEMESTER END EXAMINATION

Evaluation Pattern : Marks allocation for SEE

Subject Code	Subject Name	Design	Drawing	Viva Voce	Elective	Elective / Educational Tour/Book Review
AR601	Architectural Design - V	20	15	05	05	05

Subject Code	Subject Name	Portfolio	Viva
AR602	Building Materials & Construction Technology VI	40	10
AR605	Architectural Structures VI	40	10
AR608	Working Drawing	40	10

Subject Code	Subject Name	Theory	Project	Material Study
AR606	Building Services - IV	15	25	10
AR607	Sustainable / Environmental Design	15	25	10

Note:-

- Electives and Educational tours are part of Architectural design.
- Literature survey will be a requirement for Architectural design study. Periodical review by external juror for subjects going for viva voce.
- National/International tours may be arranged during vacation to students, to study examples of good Architecture.
- For all viva voce examinations one internal faculty and one external faculty will conduct the exam.
- Portfolios have to be submitted on prescribed date for all the subjects on the date announced by the department for one year.
- All students have to register on the first day at the beginning of the **Viva voce exam**.
- All students have to register on the first day of **Term work exams**.

SEMESTER – V

ARCHITECTURAL DESIGN -IV

Course Code: AR501

Credits: 6:0:1

Prerequisite: Nil

Contact Hours: 112 hours

Course Coordinators: Prof. Pushpa Devanathan

Course objectives:

Students will be exposed to

- The need for creating architecture in an urban setting.
- The role of symbolism, aesthetics and function in architecture.
- Dealing with various services and materials.

Course contents:

UNIT I

Design of a multi functional public building in an urban setting

UNIT II

Continuous emphasis on controls, codes and bye-laws.

UNIT III

Exercises in articulation and manipulation of programmed needs.

UNIT IV

Design methodology and criticism.

UNIT V

Evaluation of alternate concepts and presentation.

STUDIO PROJECTS: Commercial buildings, Shopping centres, hotels Auditorium, Public library, resorts, etc.

References:

1. Time savers standards for architectural design data – by John Callender (Editor)
2. Architectural design data – by Ernst Neufert.

Course outcome (COs):

Students will be able to:

- Design buildings in urban settings. (PO- a, b, h, l)
- Work with materials for functional needs and aesthetics. (PO-c, f, d, k)
- Provide necessary services in buildings. (PO- j, g)

SEMESTER – V

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY – V

Course Code: AR502

Prerequisite: Nil

Course Coordinators: Prof. Vishwas Hittalmani

Course Credits: 3: 0: 1

Contact hours: 70 hours

Course Objectives:

Students are introduced to

- The construction systems of special doors and windows.
- The fundamental principles of structural glazing and cladding.
- Pile foundations and medium span roofing systems.

Course Contents:

UNIT I

Doors and windows: various building components like aluminum doors & windows and partitions, frameless glass doors and partitions, rolling shutter and collapsible shutter, Steel windows.

UNIT II

Curtain wall systems: cladding, glazing, structural glazing, composite panels

UNIT III

Foundations and medium span roof systems: Medium span steel roof truss, north light truss etc and deep foundations

UNIT IV

Material study: Anti-termite treatment to foundation, Masonry walls and wood work, Water proofing materials and weather proofing materials like chemical admixtures and surface applications. Glass: Manufacture and various types such as plate, tinted, decorative, reinforced, laminate glass block and fiber glass, etching etc. fiber reinforced composite products and their applications

References:

1. “Construction Technology” By Chudley
2. “Construction Of Buildings” By Barry
3. “Building Construction, Principles, Practice And Materials” By Hardie Glen
4. “Text Book Of Building Construction” By Arora & Bhindra
5. “Building Construction Illustrated” By Francis D K Ching

Course Outcome (COs):

The students will be able to

- Draft and read architectural drawings and construction details of cladding and structural glazing. (PO- a)
- Identify the basic building components of special doors, windows and their construction methods. (PO- c, e)
- Use appropriate building materials based on the properties, behavior and applications. (PO- e, h, k)
- Analyze innovative details in construction. (PO- k, h)

SEMESTER – V

CONTEMPORARY ARCHITECTURE

Course Code: AR503

Pre requisite: Nil

Course Coordinator: Asst. Prof. Yashas Hegde

Credits: 3: 0: 0

Contact Hours: 42 hrs

Course Objectives:

To enable students to

- Understand contemporary architectural trends
- Understand the ideas and philosophies of architects
- Study the contemporary architectural styles in detail.

Course Contents:

UNIT I

Trends in Contemporary Architecture – Introduction and brief understanding and appreciation and comparison of general contemporary trends in Indian and Western Architecture focusing on understandings, appreciations, ideas and directions through the works of notable architects.

UNIT II

Ideology and Philosophy of: Santiago Calatrava: Zoomorphism, Study works of Santiago Calatrava and Daniel Libeskind: Commemorative Architecture, Deconstruction, Study works- Ideology and Philosophy of: Zaha Hadid, Rem Koolhaas, Frank 'O' Gehry – Blobitecture, Ar. Norman foster, Ar. Tadao Ando, Ar. I M Pei.

UNIT III

Ideology, Philosophy & Study works of Greg Lynn, Diller & Scofidio: Digital Architecture.

Genetic Algorithm, Cyberecture and digital architecture and examples.

UNIT IV

Post Independence Architecture in India- Ideology and Philosophy of: Louis I Khan - Laurie Baker: Eco-Friendly & Vernacular Architecture, Ideology and Philosophy & Study Works of Le Corbusier

UNIT V

Ideology and Philosophy of Charles Correa: Architecture of Changing Time and Philosophy & Study Works of Hafeez Contractor- Ideology and Philosophy of: B.V. Doshi: Symbolism and Nationalism, Ar. Raj Rewal & works of regional architects.

References:

1. Contemporary Architecture by Morgan, Ann Lee and Taylor Colin
2. Modern architecture in India by Bagha, Bagha and Bagha

Course outcome (COs):

Students will be able to

- Recognize contemporary architectural trends. (PO-a, c)
- Identify works based on philosophies. (PO- a, b)

SEMESTER – V
SOCIOLOGY AND ECONOMICS

Course Code: AR504

Prerequisite: Nil

Course Coordinators: Assnt. Prof. Reema H Gupta

Course Credits: 2: 0:0

Contact hours: 28 hours

Course Objectives:

To familiarize students with

- Basic concepts of Sociology.
- Basic concepts of Economics.
- Influences of Sociology and Economics on Architecture.

Course contents:

UNIT -I

Nature, Scope, Utility of Sociology, Relevance to Architecture. Elements of Society, society, community; origin and growth of societies.

UNIT II

Characteristics of Rural and Urban communities. Migration,—Slums and other social problems, social research and social surveys.

UNIT III

Definition of Economics, Laws, goods and services, utility and marginal utility, value, valuation , concept of demand and supply

UNIT IV

Time value of money, Concept of life cycle cost analysis with respect to building, sources of finance of building

References:

1. “Sociology” by Neil J Smelsa
2. “Urban Economics” by Warner Z Hirsch.

Course Outcome (COs):

The students will be able to

- Identify social behavior of the society. (PO- a, b)
- Work with economic considerations in the society. (PO- b)
- Relate sociology and Economics to Architecture. (PO- a)

SEMESTER – V

ARCHITECTURAL STRUCTURES – V

Course Code: AR505

Prerequisite: NIL

Course Coordinator: Asst. Prof. M.Vijayanand

Credits: 3:0:0

Contact hours: 42 hours

Course Objectives:

To expose the students

- To learn the concept and pre stressing system, losses involved in the design methods of PSC elements.
- To understand the design of structural steel members including connections.
- To learn the design concept of masonry walls and understanding the concepts of special structural forms.

Course Contents:

Unit I

Principle of Prestressing: Introduction- Materials for Prestressed concrete, System and method of prestressing, analysis of sections, stress and strength concept, load balancing concept, effect of loading on tensile stresses in the tendons.

Unit II

Losses of PSC members: Analysis method of losses, elastic shortening, shrinkage of concrete, creep of concrete, relaxation, anchorage slip, friction.

Unit III

Connections: Bolted connection, Introduction- code of practice- bearing and friction type of bolts- joints subjected to moment and direct load and Welded connections, Introduction- code of practice – butt and fillet welds- weld symbols- joints subjected to shear and bending - joints subjected to shear and torsion.

Unit IV

Tension Member: Introduction- types of tension member- design consideration – design of tension members.

Unit- V

Masonry Structures, Special Structural forms and Tall buildings: Introduction to Masonry structure, design concepts, concept of Shell, folded plate, domes, grid structure, flat slab, tensile and pneumatic structure and tall building concept.

References:

1. Duggal S K “Limit state design of steel structures”, Tata Mc Grawhill, New Delhi, 2010
2. Rajagopalan N, “Prestressed Concrete”, Narosa publishing house, New Delhi 2005.
3. N. Krishna Raju “Prestressed Concrete” Fourth Edition, Tata Mc Grawhill, New Delhi, 2010.
4. Subramanian N “Design of Steel Structures” as per IS 800:2007 First edition, Oxford University press, 2010.

Course Outcome (COs):

The students will be able to

- Determine the concept of method of prestressing system, losses involved in the design methods of PSC elements by the principles and requirements for prestressed concrete design and code of practice. (PO- a, e)
- Apply appropriate system to prestressed a particular structure and estimate the internal forces due to prestressing the PSC structure. (PO- a, e)
- Evaluate the initial and time dependent losses. (PO- a, e)
- Illustrate the design of tension member and identify the friction type and bearing type of bolts.
(PO- a, e)
- Demonstrate the connection subjected to moment and also to describe the concept of butt and fillet weld connections, design the welded joints subjected to shear and bending. (PO- a, e)
- Incorporate the concept of masonry wall, classification of walls, shells, domes, flat slab, pneumatic structures, grid structures, tensile structure. (PO- a, e)

SEMESTER – V

BUILDING SERVICES – III

Course Code: AR506

Prerequisite: NIL

Course Coordinators: Prof. Viswas Hittalmani

Credits: 3:0:0

Contact hours: 42 hours

Course Objectives:

To enable students to

- Study mechanical services in a building
- Integrate services with architectural design

Course Contents:

UNIT I

Mechanical ventilation, ventilation for a cinema hall, Air-conditioning for human comfort & definitions, Dust control and filters, Air cycle, Refrigeration cycle, components, Air distribution - ducts, grilles etc, Classification and application air-conditioning, Heat load estimation & thumb rules

UNIT II

Window unit, Split units without ducts, Spit unit with duct, Package unit with ducts, Direct expansion system, Chilled water system, Humidifiers & dehumidifiers

UNIT III

Introduction to vertical circulation, Lift well, pit, doors, car, machine room etc. Typical section through lift, quality & quantity of service, Types of lifts Lift bank, lobby and lift interiors, Hydraulic & traction lift, Escalator & travelator, Lift act, architect's role, Double Decker lift, sky lobby, current scenario

References:

1. Principles of Air-conditioning by Paul Lang, D B Taraporevala Sons & company Limited
2. Building Service Engineering – by David V Chadderton, E & FN SPON – an Imprint of Chapman & Hall
3. Building Construction illustrated by Francis D K ching, CBS Publishers & Distributors
4. Building Environment – By Dr. Ajitha Simha, Tata Mc-Graw Hill Publisher Co Ltd, ND
5. Mechanical System for Architects by Aly S Dadras, Mc-Graw Hill, Inc.
6. Lifts – company manuals / Brochures

Course Outcome (COs):

The students will be able to

- Incorporate mechanical services in a building. (PO- c, d, e)
- Integrate & coordinate the services knowledge in architectural design. (PO- c, j)

SEMESTER – V

LANDSCAPE DESIGN

Course Code: AR507

Prerequisite: NIL

Course Coordinator: Associate Prof. Surekha R

Credits: 2:0:1

Contact hours: 42 hours

Course Objectives:

To expose students to

- Introduction of Landscape Design
- Integration of landscape design with architectural design
- Develop basic skills required to handle simple landscape design projects

Course Contents:

UNIT I

Introduction of Landscape Design, Garden design introduction, Types of garden, Design consideration for residential gardens, fundamental principles of landscape design. Introduction to Landscape elements and street furniture's and their application and maintenance.

UNIT II

Taxonomy, units of taxonomy, systems of classification, Botanical names and common names of plant materials with site visits. Basic classification of Plant materials- Trees, shrubs, creepers and ground covers.

UNIT – III

Site planning principles, Presentation, Zoning and accessibility. Site analysis, Landscape Architect's philosophies and works.

UNIT – IV

Studio project for small scale open spaces.

References:

1. Landscape Architecture by J O Simonds
2. Introduction to Landscape Architecture by Michael Laurie

Course outcome (COs):

The students will be able to

- Exhibit basics of Landscape design. (PO- a, h)
- Integrate Landscape design in Architecture. (PO- c)
- Analyze and apply landscape design for small scale projects. (PO-e, k)

SEMESTER – V

VACATION ASSIGNMENT AND STUDY TOUR

Course Code: AR508

Credits: Nil

Prerequisite: NIL

Course Coordinator: Associate Prof. Meghana Raj

Course Objectives:

Expose students to

- Obtain knowledge on regional climatic systems and their influence on architecture.
- Develop the understanding of the climatic elements, climatic zones and impact of climatic elements on human comfort, built environment and ability to integrate them with architectural design.
- Understand the construction techniques for thermal performance walls and roofs, effects of landscape elements and site topography.
- Design considerations with respect to shading devices, day light factor, rain, etc.

Course Contents:

UNIT I

Understanding and application of Climate responsive architecture

Case studies pertaining to Vernacular architecture, climate responsive architecture, etc

Study the Chief Architectural monuments, newer works and the usage of modern construction technology

Course Outcome (COs):

The students will be able to

- Express the basic principles of climatology and apply appropriately towards environmental systems. (PO- b, e, f)
- Gather, assess, record, and apply relevant (in this case climatic elements and design techniques) information in the course work. (PO- e, k)
- Respond to natural and built site characteristics according to the region in the development of a program and design of a project. (PO- a, d, e)
- Understand and articulate basic climatology concepts and apply them in their design projects.

(PO- b, e, f)

Performance will be evaluated through viva voce exam and awarded the grade as P= Pass, F = Absent & Fail

SEMESTER: VI

ARCHITECTURE DESIGN-V

Course Code: AR601

Prerequisite: Nil

Course Coordinators: Prof. Pushpa Devanathan

Course Credits: 6: 0:1

Contact hours: 112 hours

Course Objectives:

To enable student to

- Understand the design principles of campus planning and large scale projects
- Designs have to respond to climate, environmental and ecological factors. Site planning, landscape details, circulation and services, structural viability and interiors have to be addressed.

Course contents:

UNIT I

Introduction to campus planning and Case studies of campuses.

UNIT II

Campus master plan, site planning and Site analysis

UNIT III

Detailing of a common major block like auditorium, library etc

UNIT IV

Detailing any two Academic Blocks.

References:

1. Time Saver Standards for building Types- Joseph De Chiara & John Callender
2. Time Saver Standards for Architectural Design Data-John Hancock Callender
3. Neuferts's Standards
4. Hotel and Resort Design- Anne M Schmid and Mar Scoviak - Lerner

Course Outcome (COs):

The students will be able to

- Carry out contour detailing and use space planning principles in campus designing (PO- a, b ,c, d, e, f, g, k, l, e)
- Respond to climate, environment & ecological factors (PO- h, e, j)
- Address circulation, services, structural aspects in design along with interior detailing. (PO- b, k)

SEMESTER: VI

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY VI

Course Code: AR602

Prerequisite: Nil

Course Coordinator: Prof. Vishwas Hittalmani

Course Credits : 3: 0 :1

Contact hours: 70 hours

Course Objectives:

To enable students to

- Comprehend and apply knowledge of advanced roofing technologies for large span and complex buildings.

Course contents:

UNIT I

Space frames and Geodesic domes (drafting): Introduction to Space frames and Geodesic domes, components used advantages and disadvantages, fixing details, construction details.

UNIT II

RCC Folded plate, Large Span truss / steel portal frames (drafting): Introduction to RCC Folded plate and Large span truss, advantages and disadvantages, fixing details, construction details

UNIT III

Tensile and Pneumatic structures and materials (sketching): Introduction to Tensile and Pneumatic structures, advantages and disadvantages, fixing details, construction details. Properties and usage of Synthetic material

UNIT IV

Shell roofs and materials (sketching): Introduction to. advantages and disadvantages of Shell roofs, fixing details, construction details. Properties and usage of Insulation material

References:

- “Construction Technology” By Chudley
- “Construction Of Buildings” By Barry
- “Building Construction, Principles, Practice And Materials” By Hardie Glen
- “Text Book Of Building Construction” By Arora & Bhindra
- “Building Construction Illustrated” By Francis D K Ching

Course Outcome (COs):

The students will be able to

- Use advanced roofing technologies for large span structures. (PO-c, j, k)
- Use innovative details in construction. (PO- h, k)

SEMESTER: VI

RESEARCH METHODOLOGY

Course Code: AR603

Prerequisite: Nil

Course Coordinator: Associate Prof. Dr. Monalisa

Course Credits: 2:0:0

Contact hours: 28 hours

Course Objectives:

To enable students to

- Understand concepts of research and its importance in the field of architecture.
- Understand the research methods and methodology.
- Know styles and format of writing research paper.

Course contents:

UNIT I

Introduction of the subject and its relevance to architectural field and society, Introduction: Introduction to Research Methodology, Meaning of Research, Objectives, Types, Approaches, Significance, Tools.

UNIT II

Research methods and methodology, Research process, Research design, Research hypothesis. Problem Definition, Objectives, Design, Data Collection, Data Analysis, Interpretation of Results, Validation of Results.

Research Problem Identification: Identification of Research Problem, Classroom Exercise of selecting a research problem, Identification of need to define research problem, Techniques involved in defining the Research Problems.

Research Hypothesis: Boundaries of Study, questions and possible hypothesis, formulation of a hypothesis

Research Design: Need, Characteristics of a good Design and related concepts, Types and Basic Principles of Research Designs: Classroom Exercises.

UNIT III

Sampling fundamentals, measurement and scaling techniques, Data collection. Research Design: Selection of Research Approach, Designing of Sampling Plan, Experiments and Questionnaires, methods: Probability and Non-probability samples.

Sampling Design: need, types, methods, characteristics of a good sample design, steps in sampling design, criteria for selecting sampling procedure and random sample for a infinite universe – Urban Problems

UNIT IV

Data analysis and Interpretation of results and report writing Data Collection: Types and Collection Methods, Primary and Secondary data, sources of data, method to select appropriate data collection method. Data Collection: Types and Collection Methods, Primary and Secondary data, sources of data, method to select appropriate data collection method. Significance, Steps, Layout of Report, Types of Reports, Mechanics of Writing, Precautions, Guidelines for reviewing drafts, Report formats, Typing Instructions

UNIT V

Future research and role of computers in architecture. Classroom Exercise: Very Small Sample Classroom Research Project – 1 and enable students to get practically acquainted with the Research Methodology to carry out future researches.

References:

1. “Research Methodology: Methods and Techniques” By C.R.Kothari
2. “Methodology of Research In Social Sciences” by O.R. Krishnaswami, M.Ranganathan
3. “Architectural Research Methods” by Linda N.Groat, David Wang
4. “Research Methodology by R.Panneerselvam

Course Outcome (COs):

The students will be able to

- Conduct research on different aspects of the built environment. (PO- a, c, j)
- Write research papers. (PO- g)

SEMESTER: VI

ESTIMATING AND COSTING

Course Code: AR604

Prerequisite: Nil

Course Coordinators: Asst. Prof. Aruna Gopal

Course Credits : 3:0:0

Contact hours: 42 hours

Course objectives (COs):

To enable students

- To achieve proficiency in building estimation.
- To develop necessary skill for writing specification.
- To have practical knowledge of building industry, practice and cost comparison

Course contents:

UNIT I

Procedure of estimating – Method of building estimates; estimation of earth work, wood work, road work, building, RCC roof, framed structure, steel truss, Mode of measurements

UNIT II

Material statement – Estimating of quantities of materials like cement, sand, aggregate, brick, steel, structural steel for trusses, tiles, paints used in building

UNIT III

Abstract specification; detailed specification for all items of works exposed in the construction of a compound wall, garage, residential building, office building, factory building with RCC roof, truss, Mangalore tiled roof etc; Specification of special items like false ceiling, decorative elements, flooring, wall cladding etc

UNIT IV

Analysis of rates for items in building works. Local SR rates, market rates, measurement book, RA bill, interim and final certificate; Modifying S R rates to the changes in the cost of cement change in Land distance for different materials like sand, jelly, boulders etc.

UNIT V

Estimation of a building using the given plan and specified items

References:

1. “Estimating and Costing” by S K Dutta
2. “Estimating” by S C Rangwala
3. National building and other relevant codes

Course outcome (COs):

Students will be able to:

- Prepare estimation of any kind of buildings. (PO-c)
- Write specification for any required item in a building. (PO-c)
- Prepare rate analysis, SR rates. (PO-c)
- Apply the acquired knowledge for a given building. (PO-c)

SEMESTER: VI

ARCHITECTURAL STRUCTURES-VI

Course Code: AR605

Prerequisite: Nil

Course Coordinator: Asst. Prof. M.Vijayanand

Credits: 3:0:0

Contact Hours: 42 hours

Course Objectives:

To enable students

- To understand the concept of Structural design and detailing of a Single storey Load bearing Wall residential building with staircase.
- To learn Drawing & detailing of the Structural elements designed in the residential building
- To Analyze & Design a single bay portal frame structure
- To learn Drawing & Detailing of the designed Structural elements of the portal frame.

Course Contents:

UNIT I

Design of Floor Slabs for Residential Building: Design of One Way Slab, Two Way slab with corner restraints. Drawing of Slab Reinforcement details for a entire floor plan of a load bearing wall residential building.

Staircase: Design & Drawing of the reinforcement details of dog legged staircase for a residential building.

Lintel & Chajja: Design of the Chajjas & Lintels for a residential building. Drawing the reinforcement details for the lintel & chajja for the given plan of residential building.

UNIT II

Portal Frames: Analysis of single bay Portal frame structure. Analysis of design loads of various elements of portal frame. Concept of Portal frames.

One way continuous slabs: Design of the reinforcement details of one way continuous slabs over a portal frame structure. Draw the slab reinforcement details.

Design of Beam: Analysis & design of the intermediate Portal frame beam.

Column design: Analysis & Design of columns in the portal frame.

Footing design: Analysis & design of footings in the portal frame. Drawing of the sectional elevations of entire portal frame with cross sectional details

References:

1. IS:456:2000 Plain & Reinforced Concrete Code of Practice
2. SP:16 Design Aids for Reinforced Concrete
3. Design of RCC Structural Elements- Volume I by SS Bhavikatti-1st Edition-New age international Pvt Ltd

4. Fundamentals of Reinforced Concrete Design By ML Ghambir- Asoke K Ghosh publications
5. Reinforced Concrete Design IS:456:2000 Principles & Practice by N Krishna Raju & R N Pranesh- New Age International publishers
6. Reinforced Concrete design by S.Unnikrishna Pillai & Devdas Menon-Tata McGrawhill-Second edition
7. Limit State Design of Reinforced Concrete by PC Varghese- Eastern economy Edition-2nd Edition.

Course Outcome (COs):

The students will be able to

- Conduct overall structural analysis and prepare design of a building. (PO-a, e)
- Conduct overall frame analysis of buildings. (PO- a, e)

SEMESTER: VI

BUILDING SERVICES IV

Course Code: AR606

Prerequisite: Nil

Course Coordinator: Prof. Vishwas Hittalmani

Course Credits: 3: 0:0

Contact hours: 42 hours

Course objectives:

To enable students

- To achieve proficiency in application of sound control system in design and construction.
- To study modern and prospective materials used in acoustical design.
- To have practical knowledge of architectural and environmental acoustics as per global requirement.

Course contents:

UNIT I

Scope of acoustics, properties of sound, sound absorption and reflection.

UNIT II

Study of behaviour of sound in enclosed spaces like seminar hall, auditorium, etc.

UNIT III

Acoustical design and construction, study of materials and their applications

UNIT IV

Environmental acoustics – noise control – noise isolation, traffic planning

UNIT V

Control of mechanical noise and vibration in different circumstances.

References:

1. Environmental acoustics by Leslie L Doelle
2. Architectural acoustics by David Egan
3. Acoustical design in buildings by Knudsen Vern
4. Acoustics – Noise and Buildings by Parich Peter

Course outcome (COs):

Students will be able to:

- Provide architectural services required for specialized buildings. (PO- j)
- Design and work confidently in detailing required for construction and fabrication. (PO- c, b)

SEMESTER: VI

SUSTAINABLE/ENVIRONMENTAL DESIGN

Course Code: AR607

Prerequisite: Nil

Course Coordinator: Asst. Prof. Aishwarya Y

Course Credits: 2:0:0

Contact hours: 28 hours

Course Objectives:

- To sensitize students about the need for sustainable practices in building design..
- Study of various factors involved in creating a sustainable and energy efficient building.

Course contents:

UNIT I

Introduction to sustainable design and green buildings and methods adopted in current scenario.

UNIT II

Parameters and techniques of designing Green buildings .Designing energy efficient building skins building envelops and building systems.

UNIT III

Assessment of tools in green buildings. For eg LEED, GRIHA etc

UNIT IV

Role of solar geometry in reducing energy within the built environment in addition overall understanding of passive Design principles, Renewable energy.

UNIT V

Existing case studies of Green Buildings, adapting the principles of sustainable design to Architectural Design.

References:

1. "Housing climate comfort" by Martin Evans.
2. "Climate responsive architecture" by Arvind Kishan, Baker and Szokolay
3. "Green Architecture"-Design for a sustainable future by Brende and Robert vale.
4. "Green Architecture"-A guide for sustainable design by Michael J Crosbie.

Course Outcome (COs):

The students will be able to

- Apply various factors involved in creating a sustainable and energy efficient building.
(PO- a, b, c, g, j, l)

SEMESTER: VI

WORKING DRAWING

Course Code: AR608

Prerequisite: Nil

Course Coordinators: Assnt Prof. Reema H Gupta

Course Credits: 0:0:1

Contact hours: 28 hours

Course Objectives:

To enable students

- To learn the techniques of preparing drawings which are used for construction of buildings
- To prepare centerline drawings of structural and architectural schemes
- To prepare schedule of openings required for a building
- To apply and provide the various services that needs to be provided in a building and to learn the preparation of service drawings for a building
- To learn to represent and draw the detailed interior drawings

Course Contents:

UNIT I

Introduction to Working Drawing, Plan Approval of MIG House
Working Drawing Ground Floor, First Floor & Terrace

UNIT II

Foundation and Footing Drawings & Centerline drawing

UNIT III

Schedule of Openings

Sections

Elevations

UNIT IV

Introduction to Plumbing Drawings, Marking on site
Introduction to Electrical Drawings

UNIT V

Working drawings and details of toilets, kitchen etc
Interior of Toilet – interaction & submission
Interior of Kitchen—interaction & Submission
Submission of Portfolio

References:

1. Rendering with Pen and Ink by Gill.
2. Time Saver Standards

Course Outcome (COs):

Students will be able to

- Prepare drawings which can be issued to site for construction of buildings following the conventional standard format. (PO- a, g)
- Prepare the centerline drawings, service drawings, interior detailed drawings, schedule of openings that would be required for buildings. (PO- g, d)
- Work in any architectural office as they would have learnt to generate the building drawings following universal standards. (PO- g, f).
- Analyze innovative details in construction