



RAMAIAH
Institute of Technology

CURRICULUM

for the Academic year 2022 – 2023

SCHOOL OF ARCHITECTURE

III & IV Semester B. ARCH

RAMAIAH INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)

Bangalore – 560054.

About the Institute

Dr. M. S. Ramaiah a philanthropist, founded 'Gokula Education Foundation' in 1962 with an objective of serving the society. M S Ramaiah Institute of Technology (MSRIT) was established under the aegis of this foundation in the same year, creating a landmark in technical education in India. MSRIT offers 17 UG programs and 15 PG programs. All these programs are approved by AICTE. All eligible UG and PG programs are accredited by National Board of Accreditation (NBA). The institute is accredited with 'A⁺' **grade by NAAC in March 2021** for 5 years. University Grants Commission (UGC) & Visvesvaraya Technological University (VTU) have conferred Autonomous Status to MSRIT for both UG and PG Programs since 2007. The institute is also been conferred autonomous status for Ph.D program since 2021. The institute is a participant to the Technical Education Quality Improvement Program (TEQIP), an initiative of the Government of India. The institute has 380 competent faculty out of which 65% are doctorates. Some of the distinguished features of MSRIT are: State of the art laboratories, individual computing facility for all faculty members, all research departments active with sponsored funded projects and more than 300 scholars pursuing Ph.D. To promote research culture, the institute has established Centre of Excellence for Imaging Technologies, Centre for Advanced Materials Technology, Centre for Antennas and Radio Frequency systems (CARFS), Center for Cyber Physical Systems, Schneider Centre of Excellence & Centre for Bio and Energy Materials Innovation. **M S Ramaiah Institute of Technology has obtained "Scimago Institutions Rankings" All India Rank 107 & world ranking 600 for the year 2022.**

The Entrepreneurship Development Cell (EDC) and Section 8 company "Ramaiah Evolute" have been set up on campus to incubate startups. **M S Ramaiah Institute of Technology is recognized by Atal Ranking of Institutions on Innovation Achievements (ARIIA), MoE, Govt. of India.** MSRIT 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 good collection of book volumes and subscription to International and National Journals. The Digital Library subscribes to online e-journals from Elsevier Science Direct, IEEE, Taylor & Francis, Springer Link, etc. MSRIT is a member of DELNET, CMTI and VTU E-Library Consortium. MSRIT has a modern auditorium and several hi-tech conference halls with video conferencing facilities. The institute has excellent hostel facilities for boys and girls. MSRIT Alumni have distinguished themselves by occupying high positions in India and abroad and are in touch with the institute through an active Alumni Association.

As per the National Institutional Ranking Framework (NIRF), MoE, Government of India, M S Ramaiah Institute of Technology has achieved 67th rank among 1249 top Engineering Institutions & 17th Rank for School of Architecture in India for the year 2022 and is 1st amongst the Engineering Colleges affiliated to VTU, Karnataka.

SCHOOL OF ARCHITECTURE

Ramaiah Institute of Technology (RIT), Bangalore, is a leading institution offering undergraduate, postgraduate 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 a 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 (COA) and All India Council for Technical Education (AICTE) have recognized this program.

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

Full time faculty members having postgraduate qualifications from prestigious institutions in India and abroad are teaching at The School of Architecture. 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 are ensuring excellent academic results year after year. This is reflected in the high number of University ranks that are secured by the students of the School.

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. After graduation, many students have pursued higher studies in various universities in the country and abroad. There is a great demand for the school graduates in the industry and the School is developing initiatives towards co-branding of the industry and the School. Many students have started their own enterprise and architectural practices 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, and Interior Design. The faculty also actively participates in national and international conferences and publishes and presents papers.

The School as part of a consultancy had 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.

PEO 4: Engage in continuing education and life-long learning to be competitive and enterprising.

PROGRAM OUTCOMES (POs):

PO1: Architectural knowledge: Apply the knowledge of mathematics, science, architectural fundamentals, and an architectural specialization to the solution of complex architectural problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyse complex architectural problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex architectural problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern architectural and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The architect and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional architectural practice.

PO7: Environment and sustainability: Understand the impact of the professional architectural solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the architectural practice.

PO9: Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex architectural 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 management and finance: Demonstrate knowledge and understanding of architectural and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: 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 (PSOs):

PSO1: Apply knowledge and skills of art and sciences based on function, form, materials, information, facilities, technology and analysis to Design and develop sustainable Architectural Projects.

PSO2: Ideate, formulate and solve industrial requirements and problems with a thorough knowledge of contemporary issues in industrial and service sectors and understand the impact of architectural design solutions in a global and societal context.

PSO3: Understand and respect professional and ethical responsibility and implement the concepts of project and construction management with the cutting edge technology.

BOARD OF STUDIES FOR THE TERM 2022 - 2023

- | | |
|----------------------------------|--------------------------|
| 1. Prof. (Dr.) Pushpa Devanathan | Chairperson |
| 2. Dr. Deepika Shetty | VTU Nominee |
| 3. Ar. Vidyadhar S. Wodeyar | External Industry Expert |
| 4. Ar. Prasad G | External Industry Expert |
| 5. Dr. Rama R. S | Academician |
| 6. Dr. Chidambara Swamy | Academician |
| 7. Ar. Subbiah T S | External Industry Expert |
| 8. Prof. Vishwas Hittalmani | Member |
| 9. Dr. Rajshekhar Rao | Member |
| 10. Dr. Rashmi Niranjana | Member |
| 11. Ar. (Dr.) Meghana K Raj | Member |
| 12. Ar. Reema H Gupta | Member |
| 13. Er. (Dr.) Vijayanand M | Member |

SCHOOL OF ARCHITECTURE

TEACHING FACULTY

SI No	Name	Qualification	Designation
1	Ar. Pushpa Devanathan	M Arch (Habitat Design), P.G.D.I, (PhD)	Professor & HOD
2	Ar. Vishwas Hittalmani	M Des	Professor
3	Dr. Rajshekhar Rao	M Arch (Landscape Architecture), PhD	Professor
4	Ar. Jotirmay Chari	M Arch (PhD)	Professor
5	Ar. Prasad G	M Arch (Landscape Architecture)	Professor (Tenure Faculty)
6	Dr. Rashmi Niranjan	MFA (Fine Arts), PhD	Associate Professor
7	Dr. Monalisa	M Arch, PhD	Associate Professor
8	Ar. Surekha R	M Arch (Landscape Architecture) (PhD)	Associate Professor
9	Ar. Lavanya Vikram	M Arch (Landscape Architecture) (PhD)	Associate Professor
10	Ar. Sudha Kumari	M Arch (Habitat Design)	Associate Professor
11	Ar. Meghana K Raj	M Arch (Landscape Architecture) (PhD)	Associate Professor
12	Ar. Tejaswini H	M Arch (Landscape Architecture) (PhD)	Associate Professor
12	Ar. Reema Harish Gupta	M Arch (Urban Design)	Associate Professor
13	Ar. Mallika P V	M Arch (Landscape Architecture)	Associate Professor (Tenure Faculty)
14	Ar. Sudhir Chougule	M Arch (Landscape Architecture)	Associate Professor (Tenure Faculty)
15	Ar. Nikhil V Wodeyar	P G Dip (Urban Design)	Associate Professor (Tenure Faculty)
16	Er. Vijayanand M	M Tech (PhD)	Assistant Professor
17	Er. Aruna Gopal	B E	System Analyst
18	Ar. Kriti Bhalla	B Arch	Assistant Professor
19	Ar. Aishwarya Yoganand	M Sc (Sustainable Building Systems)	Assistant Professor
20	Ar. Divya Susanna Ebin	M Arch (Urban Design) (PhD)	Assistant Professor

21	Ar. Yashas Hegde	M Arch (Urban Design)	Assistant Professor
22	Ar. Ranjitha Govindaraj	M Arch (Landscape Architecture)	Assistant Professor
23	Ar. Theju Gowda	M Sc (Architecture)	Assistant Professor
24	Ar. Akshata Shagoti	M Arch (Architectural Design)	Assistant Professor
25	Ar. Amala Anna Jacob	M Arch (Urban Design)	Assistant Professor
26	Ar. Meghana M	M A (World Heritage Studies)	Assistant Professor
27	Ar. Megha Ann Jose	MIAD (Interior Architecture & Design)	Assistant Professor
28	Ar. Pooja M Naik	M Arch (Urban Planning & Mgmt.)	Assistant Professor
29	Ar. Tanvi Katre	M Plan (Environmental Planning)	Assistant Professor
30	Ar. Anupama Doravari	M URP (Urban & Regional Planning)	Assistant Professor
31	Ar. Vidya Mohan	M Arch (Urbanism & Refurbishment)	Assistant Professor
32	Ar. Sreesha S Bhat	M Arch (Urban Design)	Assistant Professor
33	Ar. Harshita D	M Arch (Urban Design)	Assistant Professor
34	Ar. Joyce Sequeira	M Plan (Urban Planning)	Assistant Professor
35	Ar. Shwetha P E	M Arch (Urban Design)	Assistant Professor
36	Ar. Pinki Bose	M Arch (Urban Design)	Assistant Professor
37	Ar. Ashwini Mani	M Arch (Urban Design)	Assistant Professor (Tenure)

ADMINISTRATIVE STAFF

1	Mr. Nagesh B L	Dip. in Mech Engg.	Instructor
2	Ms. Swathi P	B. Com	SDA

SUPPORT STAFF

1	Mr. Ramachandra Chari	Attender
2	Mrs. Parvathi	Attender

BREAKDOWN OF CREDITS FOR B. ARCH DEGREE CURRICULUM (Semester I to X)

BATCH 2021 - 2026
(as per Council of Architecture)

SEMESTER	HUMANITIES & SOCIAL SCIENCES (HSS)	ARTS & SCIENCE (AS)	BASIC ARCHITECTURE & ENGINEERING (BAE)	PROFESSIONAL CORE SUBJECTS (PCS)	ELECTIVES	PROJECT/ INTERNSHIP	TOTAL CREDITS
I	1	7	7	11	-	-	26
II	-	8	7	11	-	-	26
III	-	6	8	11	-	1	26
IV	1	3	11	11	-	-	26
V	2	6	6	11	-	1	26
VI	2	-	13	11	-	-	26
VII	3	-	9	11	3	-	26
VIII	2	-	6	15	3	-	26
IX	-	-	-	-	-	26	26
X	-	-	-	5	3	18	26
Total	11	30	67	97	9	46	260

SCHEME OF TEACHING & EXAMINATION - III SEMESTER B. ARCH
ACADEMIC YEAR 2022 - 2023

2021 Batch			Teaching scheme per week				Examination scheme			
Sl. No	Code	Subject	Lecture / Studio	Tutorial	Practical (Study Tour/ Case Study)	Total	Contact hours	Exam	CIE Marks	SEE Marks
1	AR 301	Architectural Design II	6	0	1	7	8	SEE (viva voce)	50	50
2	AR 302	Building Materials & Construction Technology III	3	0	1	4	5	SEE (viva voce)	50	50
3	AR 303	Theory of Architecture I	3	0	0	3	3	SEE	50	50
4	AR 304	History of Architecture III	3	0	0	3	3	SEE	50	50
5	AR 305	Architectural Structures III	3	0	0	3	3	SEE	50	50
6	AR 306	Building Services	3	0	0	3	3	SEE	50	50
7	AR 307	Computers in Architecture II	1	0	1	2	3	CIE	100	
8	AR 308	Study Tour	0	0	1	1	2	SEE (viva voce)	50	50
		TOTAL	22	0	4	26	30			

CIE = CONTINUOUS INTERNAL EVALUATION

SEE = SEMESTER END EXAMINATION

EVALUATION PATTERN: Marks allocation for SEE

Subject Code	Subject Name	Design	Drawing	Viva voce	Model	Total
AR301	Architectural Design II (SEE Viva-voce)	20	20	05	05	50

Subject Code	Subject Name	Portfolio	Viva voce	Total
AR302	Building Materials & Construction Technology III (SEE Viva-voce)	40	10	50
AR308	Study Tour (SEE Viva-voce)	30	20	50

Note:

- Literature survey will be a requirement for Architectural Design study. Periodic review by external juror for subjects going for viva voce.
- National / international tours may be arranged during vacation for students, to study examples of 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 announced by the department for the viva voce subjects.
- 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 - IV SEMESTER B. ARCH
ACADEMIC YEAR 2022 - 2023

2021 Batch			Teaching scheme per week				Examination scheme			
Sl. No	Code	Subject	Lecture / Studio	Tutorial	Practical (Study Tour/ Case Study)	Total	Contact hours	Exam	CIE Marks	SEE Marks
1	AR 401	Architectural Design III	6	0	1	7	8	SEE (viva voce)	50	50
2	AR 402	Building Materials & Construction Technology IV	3	0	1	4	5	SEE (viva voce)	50	50
3	AR 403	Theory of Architecture II	3	0	0	3	3	SEE	50	50
4	AR 404	Climate Responsive Architecture	2	0	1	3	4	SEE	50	50
5	AR 405	Architectural Structures IV	3	0	0	3	3	SEE	50	50
6	AR 406	Building Services II	3	0	0	3	3	SEE	50	50
7	AR 407	Computers in Architecture III	1	0	1	2	3	CIE	100	
8	AR 408	Constitutional Law	1	0	0	1	1	SEE	50	50
		TOTAL	22	0	4	26	30			

CIE = CONTINUOUS INTERNAL EVALUATION

SEE = SEMESTER END EXAMINATION

EVALUATION PATTERN: Marks allocation for SEE

Subject Code	Subject Name	Design	Drawing	Viva voce	Book Review/Model	Total
AR401	Architectural Design – III	20	20	05	05	50

Subject Code	Subject Name	Portfolio	Viva	Total
AR402	Building Materials & Construction Technology IV	40	10	50

Note:

- Literature survey will be a requirement for Architectural Design study. Periodic review by external juror for subjects going for viva voce.
- National / international tours may be arranged during vacation for students, to study examples of 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 announced by the department for all the viva voce subjects.
- 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 – III

ARCHITECTURAL DESIGN II

Course Code: AR301

Course Credits: 6 : 0 : 1

Prerequisite: Nil

Contact Hours: 8 hours/week

Course Coordinator: Prof. Pushpa Devanathan

Course Objectives:

Students will be introduced to -

- Creation of space with a complimentary form.
- Effects of light, movement, scale, and the structure on the built environment.
- Relation between site and building.
- Relation between the user and the space.
- Study models for form development.

Course Contents

UNIT - I

Introduction to small to medium size scale public buildings, with simple circulation, passive energy techniques and single use buildings. Some suggestive projects are small buildings involving civic/ cultural use, related to children such as schools, facilities for people with special requirements, market space, health care clinic, art gallery, bank, Post Office, Guest House and Restaurant.

UNIT - II

Case studies of projects (including literature study), Explore the relationship between spaces and architectural forms, observe aspects of design like lighting, circulation, privacy, convenience, comfort, furniture arrangement, texture, colour, structures in relation to form and the building. Scale: monumental scale, human scale, study circulation flow, analyze and interpret data – form guidelines for design.

UNIT - III

Concept development – site studies/analysis and zoning based on functions, concept related discussions and group activities, evolution of conceptual sketches and encouraging study models to understand volumes, massing and frame aesthetics; reviews & revisions to emphasize design process.

UNIT - IV

Manual drafted drawing – Emphasis on transformation of conceptual drawings to the 2D drawings. Basics of preparation of floor plans, elevations and sections, reviews, and revisions.

UNIT - V

Drafting, rendering using different medium views and sketches and enable the students towards presentation techniques and understanding the form by 3D manual study models

Preparation of final sheets with all the requirements with final models.

NOTE: The design shall be sensitive to the needs of the disabled, aged people and children.

References:

1. Bryan Lawson, 'How Designers Think'; Architectural Press; 4th Edition, 2005
2. John Callender, 'Time-saver Standards for Architectural Design Data'; McGraw-Hill, 1982
3. Joseph De Chiara, Michael J Crosbie, 'Time - Saver Standards for Building Types'; McGraw Hill Education, 2017
4. Ernst Neufert, 'Architects' Data'; Wiley Blackwell, 2019.
5. Peter Zumthor , "Thinking Architecture", Lars Muller, 1998

Course outcomes (COs):

The students will be able to -

1. Develop their design philosophy through case study and literature studies. (PO: 4; PSO: 1)
2. Demonstrate the relationship between the site and building. (PO: 3; PSO: 1)
3. Interpret conceptual sketches into 2D drawings. (PO: 5; PSO: 1)
4. Establish relationship between space making & form generation. (PO: 1; PSO: 2)
5. Adopt manual presentation techniques. (PO: 10; PSO: 1)

Evaluation Pattern: Marks allocation for SEE

Subject Code	Subject Name	Design	Drawing	Viva voce	Model	Total
AR301	Architectural Design II (SEE Viva-voce)	20	20	05	05	50

SEMESTER – III

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY –III

Course Code: AR302

Course Credits: 3 : 0 : 1

Prerequisite: Nil

Contact hours: 5 hours/week

Course Coordinators: Prof. Vishwas Hittalmani

Course Objectives:

To introduce to the students to -

- The fundamental principles of RCC in framed structures.
- The fundamental principles of Staircases and its constructions.
- An understanding of the basic building materials.

Course Contents

UNIT - I

Scaffolding and formwork:

Materials used and scaffolding methods, its advantages, and disadvantages.

Formwork for slabs, columns and beams, staircases

UNIT - II

RCC Foundation and Columns: RCC footings, raft foundation, Grillage foundation, and columns, with all technical information.

UNIT - III

Trusses: Types of timber roof trusses, detail study of king post truss and queen post truss, with joinery details.

UNIT - IV

Material study: Study of Concrete as a construction material including its composition, characteristic properties, application etc.

Grades of concrete and usage.

UNIT - V

Material study: Different types of floor finishes and applications.

References:

1. Roy Chudley, 'Construction Technology'; Pearson Education, 2014
2. Arora & Bhindra, 'A Textbook of Building Construction'; Dhanpat Rai Publishing Co, 2010
3. Mario Salvarodi, 'The Art of Construction'; Chicago Review Press, 3rd Edition 2000
4. Glenn M Hardie, 'Building Construction Principles, Practices and Materials', Prentice Hall, 1995

Course Outcomes (COs):

Students will be able to -

1. Understand scaffolding methods used in building construction. (PO: 2; PSO: 1)
2. Describe the different types of foundations and columns used for RCC construction. (PO: 3; PSO: 1)
3. Demonstrate the construction of timber trusses. (PO: 3; PSO: 1)
4. Use innovative materials and details in construction. (PO: 3; PSO: 2)
5. Understand application of different floor finishes (PO: 1; PSO: 2)

Evaluation Pattern: Marks allocation for SEE (Viva Voce)

Subject Code	Subject Name	Portfolio	Viva voce	Total
AR302	Building Materials & Construction Technology III (SEE Viva Voce)	40	10	50

SEMESTER – III

THEORY OF ARCHITECTURE - I

Course Code: AR303

Course Credits: 3 : 0 : 0

Prerequisite: Nil

Contact Hours: 3 hours/week

Course coordinator: Assoc. Prof. Sudha Kumari

Course Objectives:

To enable students to -

- Explore how design compositions are made.
- Analyze, criticize and appreciate compositions based on principles.
- Explore various aspects of aesthetics in design.

Course Contents

UNIT - I

Introduction to theory of Architecture, primary elements – point, line and plane, primary shapes and solids, transformation of form – additive, subtractive and dimensional form, ordering principles – axis, symmetry, asymmetry and datum as line, plane, and volume.

UNIT - II

Introduction to Scale – visual and human scale, theory of proportion – material, structural and manufactured proportion. Proportioning system – Golden section, classical order, renaissance theories, modular, ken and Anthropometry. Principles of Architectural composition – Unity – example: Lotus Temple, duality, rhythm, and repetition.

UNIT - III

Principles of Architectural Composition – Contrast – example: Mill owners association, Le Corbusier, restraint – example: Meis Van de Rohe, hierarchy – by size, shape and placement, balance – symmetrical and asymmetrical balance, repose, punctuation, definition – example: buttresses, strength – example: materials, accentuation, gradation – example: Lingraj temple, harmony, vitality – example: Dancing house Prague, dynamism.

UNIT - IV

Spatial relationship – space within a space, interlocking space and adjacent space. Spatial organization – Central, linear, radial, cluster and grid organization.

Ornamentation – surface, junction, edge, symbolic, visual and functional ornamentation. Style/character in architecture – prehistoric to renaissance.

UNIT - V

Building materials: Physical and aesthetical properties of materials – stone, brick, concrete, timber, iron, steel and glass. Generation of form – Pragmatic, analogic, canonic, and iconic.

References:

1. Francis D K Ching, 'Architecture: Form, Space, & Order'; Wiley, 2014
2. William Lidwell, Kritina Holden, Jill Butler, 'Universal Principles of Design'; Rockport Publishers, 2010
3. Michael DeSiano, 'Elements and Principles of Art and Design'; Royal Fireworks Press
4. Karen Cordes Spence, 'A Primer on Theory in Architecture'; Routledge, 2016
5. Mihalis Karavatzis, Massimo Giovanardi, Maria Michrou, 'Inclusive Place Branding: Critical Perspectives on Theory and Practice'; Routledge, 2017
6. Leonard S. Parker, Hajin Yu, 'Basic Design Principles of Architecture'; Createspace Independent Publishers, 2011
7. Rob Krier, 'Architectural Composition'; Edition Axel Menges, 2010

Course Outcomes (COs):

Students will be able to -

1. Assess spatial programming and organizing principles possible for a given site. (PO: 1; PSO: 1)
2. Critique architectural projects for principles of composition. (PO: 1; PSO: 2)
3. Understand how variations in architectural compositions affect the form and aesthetics of a building. (PO: 3; PSO: 1)
4. Understand and analyse concepts of spatial organization for their influence on function and aesthetics of the building and site. (PO: 4; PSO: 2)
5. Understand and analyse the influence of materials on aesthetics, function, and character of buildings. (PO: 3; PSO: 2)

SEMESTER – III

HISTORY OF ARCHITECTURE -III

Course Code: AR304

Course Credits: 3 : 0 : 0

Prerequisite: Nil

Contact hours: 3 hours/week

Course Coordinator: Assoc. Prof. Reema H. Gupta

Course Objective:

- The students should be able to understand Hindu and Islamic architectural styles.

Course Contents

UNIT - I

Chalukyas - Influences & Architectural Character, Study of Ladkhan temple, Aihole; Durga Temple, Aihole, Papanath temple and Virupaksha temple at Pattadakal ; Dravidian Temple.

Introduction and Architectural Character.

Pallavas - Influences & Architectural Character, Rock cut and structural temples.

Study of Shore temple and Rathas of Mamallapuram, Kailashnath temple and Vaikunta Perumal temple at Kanchipuram.

Cholas - Influences & Architectural Character, Study of Brihadeeswara temple at Tanjore.

Pandyas - Influences & Architectural Character, Gopurams.

Vijayanagar - Influences & Architectural Character – Study of Vittala temple and

Hazara Rama temple at Hampi. Nayaks - Influences & Architectural Character, Study of Meenakshi temple at Madurai

UNIT - II

Later Chalukyans and Rashtrakutas - Influences & Architectural Character

Study of Mahadeva temple at Ittagi and Kailashnath temple at Ellora

Hoysala - Influences & Architectural Character, Study of Keshava temple at Somnathpur and Hoysaleswar temple at Halebid

UNIT - III

Jain Architecture with Study of Adinath temple at Ranakpur

Gupta Architecture with Study of Dasavatara temple at Deogarh

Orissa- Influences & Architectural Character, Study of LingRaja temple at Bhuvaneswar and Sun temple at Konark

Central India - Influences & Architectural Character, Study of Khandariya

Mahadev temple at Khajuraho

Gujarat - Influences & Architectural Character, Study of Sun temple at Modhera

UNIT - IV

Islamic Architecture -Introduction, principal parts of mosque and tomb

Slave Dynasty - Influences & Architectural Character, Study of QutbMinar and Quwwat. - ul - Islam mosque at Delhi, Tomb of Iltutmish.

Khalji Dynasty - Influences & Architectural Character, Study of Alai Darwaza

Tughlaq Dynasty - Influences & Architectural Character, Study of Tomb of Ghias- u- din Tughlaq, Khirki Masjid.

Sayyed and Lodi Dynasties- Influences & Architectural Character.

Moghul period- Influences & Architectural Character, Study of Humayun's tomb, Fatehpur Sikri, Tai Mahal

UNIT - V

Provincial styles

Punjab - Influences & Architectural Character, Study of Tomb of Shah Rukn - I - Alam

Bengal - Influences & Architectural Character, Study of Eklakhi tomb and Adina Masjid

Jaunpur- Influences & Architectural Character, examples – Study of Atala Masjid

Bijapur - Influences & Architectural Character, examples – Study of GolGumbaz

Sur Dynasty- Influences & Architectural Character

References:

1. Percy Brown, 'Indian Architecture - Buddhist and Hindu Period'; CBS, 2016
2. Percy Brown, 'Indian Architecture: Islamic Period'; CBS, 2005
3. Satish Grover, 'Buddhist and Hindu Architecture in India'; CBS, 2017
4. Christopher Tadgell, 'History of Architecture in India'; Phaidon, 1992
5. George Michell, 'World of Art Hindu Art and Architecture'; Thames and Hudson, 2000
6. Adam Hardy, 'The Temple Architecture of India'; John Wiley & Sons, 2007

Course outcomes (COs):

Students will be able to -

1. Understand the influences, architectural characters evolved during Hindu rulers in southern parts of India. (PO: 1; PSO: 1)
2. Differentiate the architectural styles from early to later developments. (PO: 2; PSO: 2)
3. Understand and identify the architectural practices in central and northern parts of India during Hindu rulers. (PO: 1; PSO: 1)
4. Understand the development of Islamic architecture during different dynasties. (PO: 1; PSO: 1)
5. Study the evolution of the provincial styles of Islamic architecture in India. (PO: 1; PSO: 1)

SEMESTER – III

ARCHITECTURAL STRUCTURES – III

Course Code: AR305

Course Credits: 3 : 0 : 0

Prerequisite: NIL

Contact hours: 3hours/week

Course Coordinator: Asst. Prof. M. Vijayanand

Course Objectives:

To enable the students to -

- Learn and understand the analysis of structural system.
- Develop the ability to interpret data and analyze structural system.

Course Contents

UNIT - I

Statically Determinate and Statically Indeterminate Structures: Introduction, statically indeterminate, external redundancy, internal redundancy, statically indeterminacy of structures with hinges, space frames, and pin jointed structures, kinematic indeterminacy.

UNIT - II

Slope and Deflection: Introduction, application of Macaulay's method to statically determinate beams, problems, introduction to moment area method, application of moment area method for statically determinate beams, problems.

UNIT - III

Consistent Deformation Method for Statically Indeterminate Structure: Introduction, procedure for the analysis of propped cantilever and fixed beams. Problems.

UNIT - IV

Moment Distribution Method for Continuous Beam without Settlement: Introduction, basic theorems, sign conventions, propped cantilever beam, continuous beam (two span and three span). Problems.

UNIT - V

Moment Distribution Method for Symmetrical Non-Sway Frames and Rectilinear Frames: Introduction, analysis of rectilinear frame, analysis of portal frame. Problems. Introduction to RCC, PSC, Steel (only theory).

References:

1. B. C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, 'Theory of Structures'; Laxmi Publications, 2017
2. K. U. Muthu, Azmi Ibrahim, M. Vijayanand, 'Basic Structural Analysis', I K International Publishing House, 2015
3. K. U. Muthu, H. Narendra, Maganti Janardhana, M. Vijayanand, 'Indeterminate Structural Analysis'; I K International Publishing House, 2014

Course Outcomes (COs):

The students will be able to –

1. Describe different forms of structures and evaluate their indeterminacy. (PO: 2; PSO: 1)
2. Analyze the slope and deflection by different methods. (PO: 4; PSO: 2)
3. Analyze the indeterminate structures using the method of consistent deformation method. (PO: 2; PSO: 2)
4. Analyze the continuous beams with moment distribution method. (PO: 4; PSO: 2)
5. Analyze the frames with moment distribution method. (PO: 2; PSO: 2)

SEMESTER – III

BUILDING SERVICES - I

Course Code: AR306

Course Credits: 3 : 0 : 0

Prerequisite: NIL

Contact hours: 3 hours/week

Course Coordinator: Prof. Vishwas Hittalmani

Course objectives:

Study the building services of water supply and sanitation and their integration with architectural design.

Course Contents

UNIT - I

-Water supply system: Water resources, quantity of water for different usages and factors effecting the quantity needs, quality of water requirements as per national and international standards. Objectives of water treatment.

UNIT - II

-Overview of Water treatment process of screening, sedimentation, flocculation, filtration (slow/rapid/pressure filtration), disinfection methods, chlorination and softening.

UNIT - III

-Water distribution: Requirement of good distribution system, Methods of distribution-gravity, pumping and combined system.
-Layouts of distribution-dead end, grid iron, ring and radial system. Distribution of water in buildings- Service connection, water meter, Pipe material types, pipe sizes, fittings, sump tank, overhead tank, cold and hot water distribution system for a residential building. Overview of Rainwater harvesting.

UNIT - IV

-Sanitation: Introduction and importance of sanitation, Systems of drainage-combined, separate and partially separate system. System of collection - dry conservancy and water carriage system, manholes, and sewer appurtenances.
-Sewage treatment: Flow sheet and purpose of each unit in activated sludge and trickling filter process.

UNIT - V

- House plumbing: Types of traps, piping in sunken slabs and false ceiling, pipe valves, sanitary fixtures- bath tubs, water closets, wash basins, sinks, bidet and urinals.
- Market survey of bath and water fixtures. System of plumbing- one-pipe, two-pipe, single-stack, partially ventilated system.
- Typical drainage details for a residential plot. Septic tank working details and basics of solid waste management.

References:

1. B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, 'Water Supply Engineering'; Laxmi Publications Pvt Ltd, 1994
2. R. S. Deshpande, S. E. Wadia, 'Textbook of Sanitary Engineering'; United Books, 1959
3. S. K. Hussain, 'Textbook of Water Supply and Sanitary Engineering'; Oxford & IBH Publishing Co Pvt. Ltd, 2017
4. Journal of Water, 'Sanitation and Hygiene for Development'; IWA Publishing
5. Baldwin Latham, 'Sanitary Engineering: A Guide to the Construction of Works of Sewerage and House Drainage, with Tables for Facilitating the Calculations of the Engineer'; Arkose Press, 2015

Course outcomes (COs):

The students will be able to -

1. Explain the sources of water supply and then requirements with quality and quantity in the distribution system. (PO: 1; PSO: 1)
2. Understand the various water treatment methods for water supply system. (PO: 1; PSO: 1)
3. Suggest the water supply scheme for any building. (PO: 3; PSO: 2)
4. Provide the sanitation scheme for any building. (PO: 3; PSO: 2)
5. Suggest various fixtures available in the market to suit the context. (PO:3; PSO: 2)

SEMESTER – III

COMPUTERS IN ARCHITECTURE -II

Course Code: AR307

Course Credits: 1 : 0 : 1

Prerequisite: Nil

Contact Hours: 3 hours/week

Course Coordinator: System Analyst Aruna Gopal

Course Objectives:

To enable students to develop skills for -

- Using computers as a tool for architectural design representation
- Drawing management & standard practices
- Creating detailed drawings using annotations
- Learning presentation techniques & plotting of drawings

Course Contents

UNIT - I

Introduction to AutoCAD & User interface Tour, units, limits, Draw tools, Exercises.

UNIT - II

Modify: All modify tools.

Measuring tools: Enquiry commands Drafting settings, Exercises.

UNIT - III

Drawing Organization: Layers, Properties, Line types, Line weights, colors.

UNIT - IV

Annotations: Texts & dimensions.

UNIT - V

Plotting & Presentation: Blocks, Layouts, page setup manager, plotting to scale, plot styles.

References:

1. Engineering Drawing and Graphics Using Autocad - T Jeyapooan
2. AutoCAD 2020: A project-based Tutorial - AutoCAD official website
3. Books Tutorial, 'AutoCAD 2020 A Project-Based Tutorial'; Kishore Publishers, 2020
4. T. Jeyapooan, 'Engineering Drawing and Graphics Using Autocad'; Vikas Publishing House, 2010
5. George Omura and Brian C. Benton, 'Mastering AutoCAD 2019 and AutoCAD LT 2019'; Wiley 2018
6. Cheryl R. Shrock, Steve Heather, 'Beginning AutoCAD 2018: Exercise Workbook'; Industrial Press, 2017
7. Terence M. Shumaker, David A. Madsen, 'Autocad and Its Applications'; Goodheart-Willcox Publishers, 2010
8. James A. Leach, Shawna Lockhart, Eric Tilleson, 'AutoCAD 2019 Instructor'; SDC Publications, 2018

Course outcomes (COs):

The students will be able to –

1. Use CAD drawing tools to represent 2D graphics of their designs. (PO: 5; PSO: 1)
2. Organise and create standards for CAD drawings. (PO: 5; PSO: 2)
3. Detail the drawings created with annotations. (PO: 5; PSO: 1)
4. Present design drawings and learn to plot at different scales. (PO: 10; PSO: 2)
5. Apply CAD to their varied drawing requirements. (PO: 5; PSO: 2)

Evaluation Pattern: Marks allocation for CIE

Subject Code	Subject Name	Assign - I	Test	Project Portfolio	Total
AR307	CIA - II	20	30	50	100

SEMESTER – III

STUDY TOUR

Course Code: AR 308

Prerequisite: Nil

Course Coordinator: Assoc. Prof. Meghana Raj

Course Credits: 0 : 0 : 1

Contact Hours: 2 hours/week

Course Objectives:

To expose the students to -

- Understand the evolution of the building process.
- Understand existing projects.
- Understand various elements of buildings and their transformation over the years.

UNIT - I

Site visits to include Modern architectural styles, theories practiced through built spaces and their evolution and influences.

Understanding the scale of building study of circulation patter user

UNIT - II

Introduction to the concept development of the place marking understand the ideologies of the architect

UNIT - III

Understanding the scale of building spatial program. Study of circulation pattern, user group and materials, Photographic documentation.

UNIT - IV

Measured drawing of the building in detail – Floor plans, elvation sections and view

UNIT - V

Final portofolio – Preparation of final sheets, rendering using different medium various sketches.

Course Outcomes (COs):

The students will be able to -

1. Measure and complete the measured drawing of simple buildings. (PO: 2; PSO: 1)
2. Represent different elements of architecture. (PO: 10; PSO: 1)
3. Translate their ideas in the form of drawings. (PO: 10; PSO: 2)

Evaluation Pattern: Marks allocation for SEE

Subject Code	Subject Name	Portfolio	Viva	Total
AR308	Study Tour (SEE Viva Voce)	30	20	50

SEMESTER – IV

ARCHITECTURAL DESIGN – III

Course Code: AR401

Course Credits: 6 : 0 : 1

Prerequisite: Nil

Contact Hours: 8hours/week

Course Coordinator: Prof. Pushpa Devanathan

Course Objectives:

The students will be introduced to -

- The concept of community living and interactive spaces
- Design of group dwellings and understand concept of sharing amenities
- The need for privacy, circulation, socio-economic determinants
- Regulatory controls.

Course Contents

UNIT - I

Introduction of issues related to design of the human habitat, its components and space standard, in both the urban and rural environments. Housing projects can be attempted with added complexities, example, dense context, occupation based, traditional urban fabric, social status and prevalent social strata. Socio cultural layer of the occupants shall form a strong fabric in the ultimate weave of the design. Projects shall aim at developing a very sensitive attitude towards micro level human habitation and the role of architecture in enhancing the quality of living.

UNIT - II

Data collection, Literature survey, Behavioral study, Case study of neighborhoods, Services study. Ability to interpret site information as a decision-making aid for architectural choices, particularly in respect of groups of buildings and to understand the needs of sharing land, spaces inside and outside dwellings, common places, common interests like security, economy, services, belonging and identity.

UNIT - III

Site-study, Analysis, Zoning and Concept. Concepts of varying types of needs for privacy in the dwelling, and the transitions from the public realm to it. Scale of the project shall be limited to allow for intensive study rather than repetitive typical configuration. Display of competence in the application of knowledge gained from the following will be an essential requirement for all the design projects: Materials & Structures and Theory of Architecture. The context for the design problems could be

both rural and urban. Projects shall aim at developing a very sensitive attitude towards micro level human habitation and role of Architecture in enhancing or curbing the quality of living

UNIT - IV

Development of Master Plan with footprints of building, road network and open spaces. Preparation of detailed Floor plans, sections, elevations, views, and model.

UNIT - V

Drafting, rendering using different medium; Views and sketches and enable the students towards presentation techniques and understanding the form by 3D manual study models. Preparation of final sheets with all the requirements with final models.

NOTE: The design shall be sensitive to the needs of the disabled, aged people and children.

References:

1. Amos Rapoport, "House Form and Culture", Prentice-Hall, 1969
2. Christopher Alexander, "Pattern Language", Oxford University Press, 1977
3. Christopher Alexander, "A Timeless Way of Building", Oxford Uni. Press, 1979
4. Gautam Bhatia, "Laurie Baker, Life, Work, Writings", Viking, 1991
5. Dick Van Gameren & Rohan Verma, "Designs for Housing: Charles Correa", 2018
6. Atul Deulgaonkar, "Laurie Baker, Truth in Architecture", Jyotsna Prakashan, 2015
7. Otto Koenig Berger, "Manual of Tropical Housing and Building", 1975
8. Geoffrey Bawa, The Complete Works, 2002
9. Atmospheres - Peter Zumthor
10. Experiencing Architecture - Eiler Rasmussen
11. The Poetics of Space - Gaston Bachelard
12. Universal Principles of Design- William Lidwell, Kritina Holden, Jill Butler
13. Pattern Language - Christopher Alexander et al
14. Thoughts on Design - Paul Rand
15. Concept Development and the Design Process - Sandra Reicis
16. Community by Design: New Urbanism for Suburbs and Small communities- Kenneth B Wall

Course outcomes (COs):

The students will be able to -

1. Evaluate the collected data and behavioral studies. (PO: 2; PSO: 2)
2. Describe the socio-economic determinants and apply concepts of community living to their design. (PO: 6; PSO: 1)
3. Outline the conditions of a site and derive their concept. (PO: 2; PSO: 2)
4. Strategise design at the overall scale of the site. (PO: 3; PSO: 2)
5. Render and present their design effectively. (PO: 10; PSO: 2)

Evaluation Pattern: Marks allocation for SEE

Subject Code	Subject Name	Design	Drawing	Viva voce	Book Review/ Model	Total
AR401	Architectural Design – III (SEE Viva voce)	20	20	05	05	50

SEMESTER – IV

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY -IV

Course Code: AR402

Course Credits: 3 : 0 : 1

Prerequisite: Nil

Contact Hours: 5 hours/week

Course Coordinator: Prof. Vishwas Hittalmani

Course Objectives:

- To introduce various RCC roofing systems
- To develop an understanding about deep foundation construction techniques.
- To understand the details of slab construction for various spanning conditions of structure.

Course Contents

UNIT - I

Introduction to slabs, Column position and centerline drawing, RCC One-way slab, Two-way slab, One-way Continuous slab, Cantilever slabs, overhangs.

UNIT - II

Principles and methods of construction with reinforcement details of: Flat Slab, Ribbed Slab, Waffle slab

UNIT - III

Principles and methods of construction with reinforcement details of Filler Slab, Coffered Slab, Precast Slab

UNIT - IV

Principles and methods of construction with reinforcement details of: Dome, Vaults, Pitched Roof and Lean-to-roof

UNIT - V

Principles and methods of construction with reinforcement details of Pile foundation Materials – Characteristics and types of Paints, Wall finishes, Internal and External plastering, Properties and Architectural applications of the same.

References:

1. "Building Construction" by Mackay-Vol-1 to 4.
2. "Construction Technology" by Chudley
3. "Construction of Buildings" by Barry
4. "Building Materials" by Rangwala
5. Design for R.C.C. Slabs - K C Jain
6. Reinforced concrete slabs - R Park
7. Arches, Vaults and Domes: Geometry and Equilibrium in the Design of Masonry Structures - Santiago Huerta
8. Pile foundations in engineering practice- Shamsheer Prakash
9. Building Construction materials and Techniques - P Purushothama Raj
10. Architect's Handbook of Construction Detailing - David Kent Ballast
11. The art of construction - Mario Salvarodi
12. Concrete Slabs: Analysis and Design- L.A. Clarke and R J Cope

Course outcomes (COs):

The students will be able to -

1. Demonstrate the fundamental knowledge of the technology used in the construction of slabs with short spans. (PO: 2; PSO: 1)
2. Apply technicalities, details and characteristics of RCC slab construction. (PO: 2; PSO: 1)
3. Incorporate and design slabs using indigenous materials. (PO: 4; PSO: 2)
4. Demonstrate the ability to design non-conventional roof forms. (PO: 4; PSO: 2)
5. Apply deep foundation techniques. (PO: 2; PSO: 1)

Evaluation Pattern: Marks allocation for SEE

Subject Code	Subject Name	Portfolio	Viva	Total
AR402	Building Materials & Construction Technology IV (SEE Viva voce)	40	10	50

SEMESTER – IV

THEORY OF ARCHITECTURE II

Course Code: AR403

Course Credits: 3 : 0 : 0

Prerequisite: Nil

Contact Hours: 3 hours/week

Course Coordinator: Assoc. Prof. Sudha Kumari

Course Objectives:

- A broad overview - the evolution of thought and trends, across timeline, of Western Architectural world during Renaissance, Baroque, Neo Classical and Modern periods

Course Contents

UNIT - I

Antiquity to 17th century: Introduction - the connection between theories and application in various eras, overview of architecture concepts evolved in the 21st century. Three fundamentals prescribed by Vitruvius, identifying the three fundamentals of Vitruvius in world architecture, contributions of Vitruvius – ‘De Architectura’, significance of ‘Vitruvian man’. Medieval architecture overview. Introduction to Renaissance, Renaissance concepts – Alberti, Cartesian theory, French academic tradition, Contributions of Blondel

UNIT - II

Theories of 18th & 19th centuries: Ideas of Marc Antoine Laugier, Ideas of Etienne Louis Boullée, Gottfried Semper – ‘Four elements of Architecture’, Gottfried Semper – ‘Principle of dressing’. ‘Principle of dressing’ in the works of modern architects, Herzog and De Meuron

UNIT - III

Modern movement: Introduction to the Modern Movement, Louis Sullivan, Adolf Loos, Walter Gropius, Mies van der Rohe, Eero Saarinen, Otto Wagner, Louis Kahn. Modern movement masters – Frank Lloyd Wright, Erich Mendelson, Richard Neutra, Kenzo Tange, Le Corbusier.

UNIT - IV

Post modernism & De-Constructivism: Introduction to Post modernism, Postmodern theory – Robert Venturi, Charles Jencks. Introduction to Deconstructivism, fundamental beliefs and philosophies of Peter Eisenman

UNIT - V

Architectural thought – Amos Rappaport & Geoffrey Broadbent, Architectural criticism overview

References:

1. Form, space and order – Francis D K Ching
2. Design in Architecture - Geoffrey Broadbent
3. House, Form and Culture - Amos Rappaport
4. Modern movements in Architecture – Charles Jencks
5. Writing Architecture - Carter Wiseman
6. Ideas that Shaped Buildings - Fil Hearn
7. Modern Architecture. A Critical History - Kenneth Frampton
8. Writing About Architecture- Alexandre Lange
9. A Primer on Theory in Architecture - Karen Codes
10. Universal Principles of Design - William Lidwell
11. Architectural Composition - Rob Krier
12. Meaning in the Built environment - Amos Rappaport
13. Professor Geoffrey Broadbent, 'Design in Architecture'; Spon Press, 1990
14. Francis D. K. Ching, 'Architecture: Form, Space and Order'; Wiley, 2014
15. Amos Rapoport, 'House Form and Culture', Pearson 1969
16. Charles Jencks, 'Modern Movements in Architecture'; Penguin, 1973
17. M. Fil Hearn, 'Ideas that Shaped Buildings'; MIT Press, 2003
18. Kenneth Frampton, 'Modern Architecture: A Critical History'; Thames and Hudson, 2007
19. Karen Cordes Spence, 'A Primer on Theory in Architecture'; Routledge, 2016
20. William Lidwell , Kritina Holden, Jill Butler, 'Universal Principles of Design'; Rockport Publishers, 2010
21. Rob Krier, 'Architectural Composition'; Axel Menges, 2010
22. Amos Rapoport, 'The Meaning of the Built Environment: A Nonverbal Communication Approach'; University of Arizona Press, 1990

Course outcomes (COs):

The students will be able to -

1. Identify the evolution of thoughts and trends across the timeline of Western Architecture. (PO: 1; PSO: 1)
2. Study the important events which affect the built forms and its transition. (PO: 6; PSO: 1)
3. Understand the concepts of various architects across modern movement. (PO: 3; PSO: 1)
4. Identify the evolution of thoughts and trends across timeline of western architecture. (PO: 3; PSO: 1)
5. Understand the various built forms through critics. (PO: 4; PSO: 1)

SEMESTER – IV

CLIMATE RESPONSIVE ARCHITECTURE

Course Code: AR404

Course Credits: 2 : 0 : 1

Prerequisite: Nil

Contact hours: 4 hours/week

Course Coordinator: Asst. Prof. Aishwarya Yoganand

Course Objectives:

To expose to the students to -

- The knowledge required for understanding the influence of climate on architecture.

UNIT - I

Introduction: Elements of climate, Enumerating and representing climatic data. Classification of climate, major climatic zones of the world, tropical climate further classification.

UNIT - II

Thermal comfort: Effect of climatic elements on thermal comfort, heat exchange process, effective temperature.

UNIT - III

Construction Techniques: Construction techniques to improve thermal performance of walls and roofs in various climatic zones.

Natural Ventilation: Effects of openings in internal and external features, design considerations etc.

UNIT - IV

Effect of landscape elements and site topography.

UNIT - V

Design considerations: Design consideration for various climatic zones of India with respect to shading devices, day light factor, rain etc.

References:

1. Koenigsberger, Manual of Tropical Housing & Buildings (Part-II), Orient Longman, Bombay, 1996
2. Tropical Architecture, C P Kukreja

3. Climate Responsive Architecture: A design Handbook for Energy Efficient Building - Arvind Krishnan
4. Thermal Comfort: Analysis and Applications in Environmental Engineering - Povl Ole Fanger
5. Materials for Energy Efficiency and Thermal Comfort in Buildings - Matthew R Hall
6. Tropical Climates- Cath Senker
7. Climate Responsive Design - Richard Hyde
8. The Climatic Dwelling - An Introduction to Climate-Responsive Residential Architecture - E. O'Cofaigh, A. Olley, O. Lewis
9. Climate Responsive Building- Paul Gut and Dieter Ackerknecht

Course outcomes (COs):

The students will be able to -

1. Understand the basic principles of various climatic systems. (PO: 4; PSO: 1)
2. Apply thermal comfort techniques in designing built spaces. (PO: 3; PSO: 2)
3. Provide natural ventilation and daylighting for built spaces. (PO: 3; PSO: 1)
4. Understand the impact of landscape elements in the site context and design accordingly. (PO: 7; PSO: 2)
5. Apply various climatic responsive strategies to create design solutions for different climatic zones. (PO: 3; PSO: 2)

SEMESTER – IV

ARCHITECTURAL STRUCTURES – IV

Course Code: AR405

Course Credits: 3 : 0 : 0

Prerequisite: NIL

Contact hours: 3 hours/week

Course Coordinator: Asst. Prof. M. Vijayanand

Course Objectives:

- The students are exposed to the Design of Reinforced Concrete Structures with emphasis on Limit State Method.
- The student should be able to analyze and design of basic structural elements

Course Contents

UNIT - I

Design Philosophy – Concept of Elastic method, ultimate load method and limit state method –Limit State philosophy - IS code provisions – load and load combinations – Stress and strain relationship of reinforcing steel and concrete. Use of IS456 Code

UNIT - II

Limit state design of Beams – Analysis and design of singly and doubly reinforced beams and analysis of T- beam. Use of IS456 Code

UNIT - III

Limit state design of Slabs – Design of one way simply supported and continuous slab. Design of two-way rectangular slab subjected to uniformly distributed load for various boundary conditions, Design of staircase (dog- legged). Use of IS456 Code & SP16 Code

UNIT - IV

Limit state design of column – Design of short axially loaded RC columns, RC Columns with uniaxial moment. Use of IS456 Code & SP16 Code

UNIT - V

Limit state design of Footing – Loads on foundation, types of footing, Design of axially loaded square footing. Use of IS456 Code & SP16 Code

Textbooks:

1. Unnikrishna Pillai, S., Devadas Menon, “Reinforced Concrete Design”, Tata McGraw-Hill Publishing Company Ltd., New Delhi. 2006
2. Varghese, P.C., “Limit State Design of Reinforced Concrete” (Second Edition), Prentice Hall of India, Pvt. Ltd., New Delhi. 2006
3. Krishna Raju, N., “Design of Reinforced Concrete Structures”, CBS Publishers & Distributors, New Delhi 2010
4. Gambhir M.L., “Fundamentals of Reinforced concrete design”, Prentice Hall of India, Pvt. Ltd., New Delhi 2006.

References:

- Analysis and Design of Substructures Limit State Design - Saran S
- Limit State Design of Reinforced Concrete - Dayaratnam P

Course outcomes (COs):

The students will be able to -

1. Describe and apply limit state design concept in Reinforced concrete elements. (PO: 4; PSO: 1)
2. Analyse, design and detailing of varieties of beams. (PO: 4; PSO:2)
3. Analyse, design and detailing of slabs and stairs. (PO: 4; PSO: 2)
4. Analyse, design and detailing of columns. (PO: 4; PSO: 2)
5. Analyse, design and detailing of footings. (PO: 4; PSO: 2)

SEMESTER – IV

BUILDING SERVICES II

Course Code: AR406

Course Credits: 3 : 0 : 0

Prerequisite: Nil

Contact Hours: 3 hours/week

Course Coordinators: Prof. Vishwas Hittalmani

Course objectives:

To enable the students to -

- Achieve proficiency in application of electrical services in design & construction.
- Study the materials used in electrical services for buildings.
- Gain practical knowledge of electricity and illumination applications used in current architectural practice.
- Comprehensively plan and design the electrical and illumination scheme of a building.

Course contents

UNIT - I

Study of supply and distribution of electricity to buildings from generating stations to load centers; overhead versus underground distribution systems, line supports, panel boards, etc.

Service connections, Substations, transformers, panel boards, distribution boards, fuses, MCB.

UNIT - II

Wires and cables-Conductor materials used in cables, insulating materials, Types of cables used in internal wiring. Internal supply and distribution electrical energy; Types of Earthing.

UNIT - III

Quality and quantity of light; Methods of lighting – Ambient, task and accent lighting, street lighting, factory lighting. Systems of luminaries, direct, indirect, etc.

Types of electrical lamps – incandescent, fluorescent/CFL, LED, neon lamps and their lighting characteristics; Design considerations for different types of occupancies and tasks and calculation of lighting requirement

UNIT - IV

Electrical Load Estimation- Preparation of electrical scheme and the electrical load calculations for buildings

UNIT - V

Fire prevention, precaution, Fire resisting materials, Alarm equipments, extinguishers, Sprinklers, detectors; Fire escape lift, staircase, etc; Fire stations, Systems adopted in various building types against fire, case studies; Fire – Norms and regulations as per bye-law, NBC – fire and life safety

Textbooks:

1. “Electrical Engineering” by Anwari.
2. Electrical Technology by VH Cotton
3. “Electrical wiring, Estimation and Costing”, by L Uppal.
4. National Building Code - Bureau of Indian Standards

References:

- Lighting Design Basics - Mark Kerlen
- Architectural Lighting Design - Admir Jukanovic
- Handbook of Electric power calculation H Wayne Beaty
- Electrical Services for Buildings - E. F. Curd
- Illustrated Guide to Electrical Building Services - Saulles and Tom De
- Electrical Systems in Buildings- S David Hughes
- Practical Electrical Wiring - Herbert P Richter
- Electrical Conductors- A Bhatia

Course outcomes (COs):

The students will be able to -

1. Prepare, design, and estimate the electrical load required for any building. (PO: 4; PSO: 1)
2. Classify the various types of cables used in internal wiring. (PO: 1; PSO: 1)
3. Design lighting schemes required for different occupancies and tasks. (PO: 2; PSO: 2)
4. Estimate the electrical load for a building. (PO: 4; PSO: 2)
5. Apply firefighting norms while designing a building. (PO: 4; PSO: 2)

SEMESTER – IV

COMPUTERS IN ARCHITECTURE – III

Course Code: AR407

Course Credits: 1 : 0 : 1

Prerequisite: Nil

Contact Hours: 3 hours/week

Course Coordinator: Asst. Prof. Aruna Gopal

Course Objectives:

To enable the students to -

- To develop skills required in using computers as a tool for architectural design representation
- To develop 3D modeling techniques for visualization & to create photorealistic outputs using 3dsMax.
- To learn Rendering and Presentation techniques using 3dsMax and Photoshop.

Course contents

UNIT - I

User Interface essentials: Interface setup, Units, Navigational tools.

Basic commands: Open, Save, import from CAD, Export options.

Transform tools: Move, copy, rotate, scale, selection options

UNIT - II

Modeling: Standard & Extended primitives, 2D shapes

Editing & Modifying: Edit spline, Edit Mesh, Extrude, Sweep, loft, lathe, Twist,

Taper, Edit poly, Boolean commands

UNIT - III

Materials: Material Editor, Textures, colors, Bump, Opacity, Reflection controls

Mapping: UVW map, real world scale adjustments

Lights: Standard lights, mental ray light parameters

Shadows: Shadow types & Parameters

UNIT - IV

Rendering: Render setup parameters, Output formats.

UNIT - V

Presentation techniques: Photoshop tools & techniques, Draw tools, Filters, toning, selections, effects.

References:

1. Revit Architecture: The Family Editor- Paul F. Aubin
2. Mastering Autodesk Revit 2020 - Robert Yori
3. Advanced Modeling in Revit Architecture- Paul F. Aubin

Course outcomes (COs):

The students will be able to -

1. Acquire the knowledge of 3D modelling tools for visualization and to generate construction drawings. (PO: 5; PSO: 1)
2. Apply the software tools to visualize projects in 3D space. (PO: 5; PSO: 2)
3. Apply the techniques for conceptual massing forms and generate views of a project. (PO: 5; PSO: 2)
4. Apply the software to get rendered views for design presentations. (PO: 10; PSO: 2)
5. Create design presentations and compositions using image editing applications. (PO: 5; PSO: 1)

Evaluation Pattern: Marks allocation for CIE

Subject Code	Subject Name	Assign	Test	Project Portfolio	Total CIE
AR407	Computer in Architecture - III	20	30	50	100

SEMESTER – IV

CONSTITUTIONAL LAW

Course Code: AR408

Course Credits: 1 : 0 : 0

Prerequisite: Nil

Contact Hours: 1 hour/week

Course Coordinator: Humanities Department

Course Objectives:

To enable the students to -

- provide basic information about Indian constitutional law.
- identify individual role and create legal awareness.

Course Contents

UNIT - I

Evolution of Indian Constitution, The Preamble, fundamental rights in detail and exercise of rights under Part III, limitations & important cases.

UNIT - II

Relevance of directive principles of state policy under part-IV, Fundamental duties & their significance. Special Constitutional Provisions for SC&ST, Women & Children.

UNIT - III

Union executive-President, Prime Minister, Parliament & State Executive-Governor, Chief Minister, State Legislatures.

UNIT - IV

Union and State judiciary -Supreme Court of India & High courts of the states.

UNIT - V

Emergency provisions, electoral process, amendment procedure and major constitutional amendments.42nd, 44th, 74th, 76th, 86th and, 91st Amendments.

References:

1. Introduction to Constitution of India -Durga Das Basu; 19th/20th edition 2001
2. Phaneesh K.R. 'Constitution of India and Professional Ethics'; Sudha Publications; 7th Edition, 2014

3. Constitutional law of India — Dr. J. N. Pandey, Central Law Agency 37th edition 2001
4. A Primer on Constitution of India & Professional ethics, VTU Publication-2002
5. Merunandan K.B. and B.R. Venkatesh, 'An Introduction to Constitution of India and Professional Ethics'; Meragu Publications; 3rd Edition, 2011
6. Indian Constitutional Law- M.P Jain
7. Constitution of India- V N Shukla
8. The Indian constitution- Granville Austin
9. A Primer on Constitution of India & Professional ethics, VTU Publication-2002
10. Working a Democratic Constitution- Granville Austin
11. Balanced Constitutionalism: Courts and Legislatures in India and the United Kingdom- Chintan Chandrachud
12. M. V. Pylee, 'An Introduction to Constitution of India'; Vikas Publishing; 2002

Course outcomes (CO):

The students will be able to -

1. Enhance their legal literacy by understanding the fundamental principles of Indian constitutional law. (PO: 6; PSO: 3)
2. Identify various provisions of Directive Principles of state policies and fundamental duties. (PO: 6; PSO: 3)
3. Explain the powers of the executive and legislature. (PO: 6; PSO: 3)
4. Explain the powers of the judicial system. (PO: 6; PSO: 3)
5. Analyse and implement certain laws as a citizen and as a professional. (PO: 6; PSO: 3)