RAMAIAH
Institute of Technology

CURRICULUM

Outcome Based Education

(Effective from the Academic Year 2026- 2027)

SCHOOL OF ARCHITECTURE

III & IV SEMESTER B.ARCH

Batch 2025

RAMAIAH INSTITUTE OF TECHNOLOGY
(Autonomous Institute, Affiliated to VTU)
Bangalore- 560054

CURRICULUM

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 18 UG programs and 15 PG programs. All these programs are approved by AICTE. All eligible UG and PG programs are accredited by the 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 has also been conferred autonomous status for Ph.D. program since 2021. The institute is a participant in the Technical Education Quality Improvement Program (TEQIP), an initiative of the Government of India. The institute has 380 competent faculty out of which 70% 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.

The Entrepreneurship Development Cell (EDC) and "Ramaiah Evolute" have been set up on campus to incubate startups. 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. The Institute is a member of DELNET, CMTI and VTU E-Library Consortium. The Institute has a modern auditorium, recording studio, 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 75th rank among 1584 top Engineering Institutions and 31st Rank among 131 Schools of Architecture in India for the year 2025

SCHOOL OF ARCHITECTURE

Established in 1992, the School of Architecture at Ramaiah Institute of Technology (RIT), Bengaluru, is committed to excellence in architectural education, design and research. The School provides a contemporary, interdisciplinary learning environment that integrates architectural design, building technology, sustainability, digital tools and professional exposure, preparing students to respond creatively and responsibly to the evolving built environment.

The School functions under Ramaiah Institute of Technology, an autonomous institution affiliated to Visvesvaraya Technological University (VTU), Belagavi. Its programmes are approved by the Council of Architecture (CoA), New Delhi, the statutory regulator for architectural education under the Architects Act, 1972. Teaching is design-led and is supported by site studies, workshops, industry interaction, research and experiential learning that develop critical thinking in architecture and allied disciplines.

Ramaiah Institute of Technology is accredited by the National Assessment and Accreditation Council (NAAC) with an A+ grade and is ranked 31st in the NIRF 2025 Architecture and Planning category.

The School offers a five-year Bachelor of Architecture (B.Arch.) programme with a sanctioned intake of 80, and two postgraduate programmes of two years' duration, Master of Architecture (Landscape Architecture) and Master of Architecture (Advanced Architecture), each with a sanctioned intake of 20. The School also offers a Ph.D. programme to support advanced research and scholarly inquiry in architecture. Together, the programmes engage with architectural design, sustainable practice, landscape and ecological systems, advanced and digital technologies, and contemporary architectural research.

The School's faculty comprises academicians, practising architects and specialists from allied disciplines. Their combined teaching, research and professional experience links theory, design and practice. Faculty support student development through mentoring, studio-based and innovative pedagogy, research projects and professional collaborations.

Students build a foundation in design thinking, technical knowledge, digital tools, sustainability, research and professional practice through studio work, hands-on learning, site exposure and interaction with practising professionals. The curriculum develops creativity, critical thinking, problem-solving and communication skills. Graduates pursue careers in architectural practice, urban design, landscape architecture, interior design, conservation, sustainable and computational design, project management, academia, research and consultancy, as well as entrepreneurship and advanced studies in India and abroad.

Through its combination of design, research and professional engagement, the School aims to develop architects and design professionals equipped to shape a responsive, resilient and future-ready built environment.

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 -

1. Imparting quality technical education by nurturing a conducive learning environment through continuous improvement and customization.
2. Establishing research clusters in emerging areas in collaboration with globally reputed organizations.
3. 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 stakeholders concerned.

VISION OF THE DEPARTMENT

To be a leading centre of architectural education that nurtures creative and critical thinkers committed to shaping sustainable, inclusive and innovative built environments

MISSION OF THE DEPARTMENT

MSRIT shall meet the global socio-economic needs through -

1. To impart design excellence by fostering creativity and critical thinking through studio-based learning supported by contemporary technology.
2. To inculcate sustainability, social responsibility, ethical values and a global outlook in the design and practice of architecture.
3. To develop professionally competent and entrepreneurial architects through interdisciplinary learning and real-world industry exposure.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

PEO 1: Graduates will be able to create architecture of design excellence that is critically informed, applying emerging digital and computational technologies

PEO 2: Graduates will be able to deliver sustainable, socially responsible and ethically grounded built environments, with a global outlook rooted in the climatic and cultural context.

PEO 3: Graduates will practice as competent professionals and collaborate effectively with architects and allied professionals

PEO 4: Graduates will pursue lifelong learning, research or higher studies and lead innovation and entrepreneurial ventures responsive to emerging societal needs.

KNOWLEDGE AND ATTITUDE PROFILE (WK)

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, reuse of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9: Ethics, inclusive behaviour and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

PROGRAM OUTCOMES (POs):

On completion of 5 year B.Arch. Degree program, Bachelor of Architecture graduates will be able to:

PO1: Ability to create architectural designs that satisfy both aesthetic and technical requirements.

PO2: Adequate knowledge of the histories and theories of architecture and the related arts, technologies and human sciences.

PO3: Knowledge of the fine arts as an influence on the quality of architectural design.

PO4: Adequate knowledge of urban design, planning and the skills involved in the planning process.

PO5: Understanding of the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces between them to human needs and scale

PO6: Understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take account of social factors.

PO7: Understanding of the methods of investigation and preparation of the brief for a design project.

PO8: Understanding of the structural design, constructional and engineering problems associated with building design.

PO9: Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate

PO10: The necessary design skills to meet building users' requirements within the constraints imposed by cost factors and building regulations.

PO11: Adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning.

PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO1: ApplyGraduates will be able to design creative, climate-responsive architectural solutions, using critical inquiry and digital, computational tools to resolve spatial, technical and contextual requirements.

PSO2: Graduates will be able to apply principles of sustainability, inclusivity and ethics to develop socially responsible built environments that respond to the climatic and cultural context with awareness of global practices

PSO3: Graduates will be able to demonstrate professional readiness in building technology, practice management and regulations, and collaborate with allied disciplines

Semester-wise Credit Breakdown for B.ARCH. Degree Curriculum Batch 2026-31
(as per Council of Architecture)

Semester / Course category	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eight	Ninth	Tenth	Total
PROFESSIONAL CORE COURSE (PC)	13	13	13	10	10	12	10	11	20	-	112
BUILDING SCIENCE & APPLIED ENGINEERING (BS & AE)	7	7	10	13	10	10	4	4	-	-	65
PROFESSIONAL ELECTIVES (PE)	2	4	1	-	4	2	6	3	3	-	25
OPEN ELECTIVES (OE)	1	-	-	1	2	-	-	2	-	-	6
PROJECT/SEMINAR/ INTERNSHIP (PAECC)	-	-	-	-	-	2	6	6	3	26	43
SKILL ENHANCEMENT COURSE (SEC)	3	2	2	2	-	-	-	-	-	-	9
TOTAL	26	26	26	26	26	26	26	26	26	26	260

Note: The Bachelor of Architecture (B.Arch) programme comprises a total of 260 credits and is structured in accordance with the curriculum framework prescribed by the Council of Architecture (CoA) under the *Minimum Standards of Architectural Education Regulations, 2020*. Each on-campus semester shall be of 15 weeks' duration, during which the prescribed course content shall be completed. The total credits shall be distributed across the prescribed course categories to ensure a balanced, comprehensive, and progressive architectural education.

The course categories prescribed by the Council of Architecture, along with their respective aims, are as follows:

1. **Professional Core Courses**: These courses establish the essential knowledge base and competencies required for architectural education and practice. They develop students' abilities in design thinking, spatial planning, architectural representation, historical and theoretical understanding, and the integration of functional, aesthetic, and contextual considerations. These include Architectural Design, Basic Design, Architectural Graphics, History of Architecture, and Theory of Architecture.
2. **Building Sciences and Applied Engineering (BS & AE)**: These courses provide the scientific, technical, and engineering knowledge that informs and supports architectural design. They develop students' understanding of building materials and construction, structural systems, building services, environmental conditions, building performance, and construction technologies, enabling the integration of technical, functional, and environmental considerations into architectural practice.
3. **Elective Courses (PE / OE):** These courses provide opportunities for students to broaden their knowledge, explore specialised areas, and pursue individual interests beyond the prescribed core curriculum.Elective courses are classified into two :

- **Professional Electives (PE):** courses which offer specialised, advanced, or supportive knowledge within the discipline of architecture.
- **Open Electives (OE):** courses that facilitate interdisciplinary learning and the development of additional knowledge, proficiencies, and skills from other disciplines or domains.

4. **Employability Enhancement Courses (EEC)**: These courses develop the professional competencies, practical skills, and additional capabilities required for career readiness and lifelong learning. They are classified into:

- **Professional Ability Enhancement Compulsory Courses (PAECC):** which develop essential competencies considered necessary for professional and career development.
- **Skill Enhancement Courses (SEC):** which focus on developing specific technical, professional, digital, communication, or other relevant skills that enhance employability and professional effectiveness

Course Evaluation and Assessment Pattern

The course categories define the intended learning focus and competencies of the B.Arch. programme. The assessment of individual courses shall be determined by the nature of the course, its prescribed Course Outcomes (COs), learning activities, and requirements specified in the curriculum.

Accordingly, courses across the prescribed categories shall be evaluated through Continuous Internal Evaluation (CIE), Semester End Examination (SEE), Term Work, or Viva Voce, as applicable to the respective course structure.

Internal assessment may comprise tests, assignments, seminar presentations, reports, discussions, sketches, models, documentation, and other assessment components, as applicable to the course and in accordance with the requirements prescribed by the Council of Architecture (CoA). Courses involving substantial practical, design, or application-oriented work may be assessed through Term Work or Viva Voce, while theory-oriented courses may be assessed through CIE and SEE. The applicable assessment components, maximum marks, and weightages shall be specified for each course.

The evaluation pattern shall be as follows:

1. Continuous Internal Evaluation (CIE): CIE shall be evaluated for 50 marks, comprising internal tests (30 marks) and other assessment components (20 marks).Two internal tests shall be conducted during the semester. Each internal test shall consist of three questions, of which students shall answer any two full questions. Each question shall address the Course Outcomes (COs) prescribed for the respective test. The average of the two internal tests shall be considered for awarding 30 marks. The remaining 20 marks shall be assessed through other components as decided by the course instructor.

2. Semester End Examination (SEE): The SEE shall be conducted for 100 marks and scaled down to 50 marks. The question paper shall consist of ten questions with internal choice, comprising two questions per unit. Students shall answer any five full questions, selecting at least one question from each unit.

3. Term Work: Term Work shall be evaluated for 50 marks by a panel of one external examiner and one internal examiner in the absence of

students. The assessment shall be based on the quality, completeness, technical accuracy, and overall standard of the submitted work. Depending on the course requirements, the evaluation may include assignments, drawings, reports, models and other prescribed deliverables as applicable to the course.

4. Viva Voce: Viva Voce shall be conducted for 50 marks by a panel of one external examiner and one internal examiner except for Architectural Design Project and Practical Training for which the panel will constitute two external examiners and one internal examiners. Students shall individually present and explain their work, demonstrate their understanding of the concepts and techniques applied, and respond to questions related to their submissions and course content. The assessment shall consider conceptual understanding, practical application, achievement of the prescribed Course Outcomes (COs), and the ability to communicate and justify design decisions and technical solutions.

SCHEME OF TEACHING & EXAMINATION

III SEMESTER B. ARCH

Batch 2025

Sl. No	Course Code	Course Title	Category	Credits				Total Contact hours per week			
				L	T	P	Total	L	T	P	S
1	AR301	Architectural Design II	PC	0	0	7	7	0	0	7	7
2	AR302	Building Materials & Construction Technology III	BS & AE	0	0	4	4	0	0	4	4
3	AR303	Theory of Architecture I	PC	3	0	0	3	3	0	0	3
4	AR304	History of Architecture III	PC	3	0	0	3	3	0	0	3
5	AR305	Architectural Structures III	BS & AE	3	0	0	3	3	0	0	3
6	AR306	Building Services I	BS & AE	3	0	0	3	3	0	0	3
7	AR307	Computers in Architecture II	SEC	0	0	1	1	0	0	1	1
8	AR308	Study Tour	PE	0	0	2	2	0	0	2	2
TOTAL				**12**	**0**	**14**	**26**	**12**	**0**	**14**	**26**

Nomenclature: PC: Professional core, BS &AE: Building science and applied engineering, SEC: Skill enhancement course, PE: Professional elective.

Credit Definition:

- **1 credit = 1 hour/week of lecture (L)**
- **1 credit = 1 hour/week of tutorial (T)**
- **1 credit = 1 hours/week of practical(P)**
- **Self Learning Hours (S)**

SCHEME OF TEACHING & EXAMINATION

IV SEMESTER B. ARCH

Batch 2025

Semester 4											
Sl. No	**Course Code**	**Course Title**	**Category**	**Credits**				**Total Contact hours per week**			
				L	**T**	**P**	**Total**	**L**	**T**	**P**	**S**
1	AR401	Architectural Design III	PC	0	0	7	7	0	0	7	7
2	AR402	Building Materials & Construction Technology IV	BS & AE	0	0	4	4	0	0	4	4
3	AR403	Theory of Architecture II	PC	3	0	0	3	3	0	0	3
4	AR404	Climate Responsive Architecture	BS & AE	0	0	3	3	0	0	3	3
5	AR405	Architectural Structures IV	BS & AE	3	0	0	3	3	0	0	3
6	AR406	Building Services II	BS & AE	3	0	0	3	3	0	0	3
7	AR407	Computers in Architecture III	SEC	0	0	2	2	0	0	2	2
8	AR408	Constitutional Law	OE	1	0	0	1	1	0	0	1
TOTAL				**10**	**0**	**16**	**26**	**10**	**0**	**16**	**26**

Nomenclature: PC: Professional core, BS &AE: Building science and applied engineering, SEC: Skill enhancement course, OE: Open elective.

Credit Definition:

- **1 credit = 1 hour/week of lecture (L)**
- **1 credit = 1 hour/week of tutorial (T)**
- **1 credit = 1 hours/week of practical(P)**
- **Self Learning Hours (S)**

SEMESTER – III

ARCHITECTURAL DESIGN II	
Course Code: AR301	**Course Credits: 0 : 0 : 7**
Prerequisite: Nil	**Contact Hours:7x15P**
Course Coordinator: Assoc. Prof. Sudha Kumari	

Course Content

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.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation,Discussion.

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.

- Pedagogy / Course delivery tools-: Power Point Presentation, Discussion

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.

- Pedagogy / Course delivery tools-:Power Point Presentation, Discussion, Chalk and talk.

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.Introduction to AI-assisted visualization and presentation for concept exploration, material studies, lighting studies, and precedent visualization

- Pedagogy / Course delivery tools-: Power Point Presentation, Discussion, Chalk and talk.

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

- Pedagogy / Course delivery tools-: Power Point Presentation, Discussion, Chalk and talk.

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

Reference Book:

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. 1. Describe and explain the planning features, circulation and passive energy strategies of small to medium scale public buildings. (PO1, PO2, PO5, PO6, PO7, PO9, PO10, PSO1, PSO2)
2. 2. Analyse case studies to interpret the relationship between space, form, circulation, lighting and comfort, and derive design guidelines. (PO1, PO2, PO3, PO5, PO6, PO7, PO8, PO9, PSO1, PSO2)
3. 3. Apply site analysis and functional zoning to develop a design concept through conceptual sketches and study models. (PO1, PO3, PO4, PO5, PO7, PO9, PO10, PSO1, PSO2)
4. 4. Illustrate conceptual ideas as 2D drawings (plans, elevations and sections) and use AI-assisted tools to explore materials, lighting and precedents. (PO1, PO3, PO8, PO9, PO10, PO11, PSO1, PSO3)
5. 5. Integrate drawings, renderings and a 3D study model into a final presentation and justify the design decisions. (PO1, PO3, PO5, PO6, PO8, PO10, PO11, PSO1, PSO2, PSO3)

Course Assessment and Evaluation:

<table>
<tr><td colspan="4">Continuous Internal Evaluation (CIE): 50 Marks</td></tr>
<tr><td colspan="2">Assessment Tool</td><td>Marks</td><td>Course outcomes addressed</td></tr>
<tr><td colspan="2">Review-I</td><td>30</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Review-II</td><td>20</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Semester End Examination (SEE):VIVA-VOCE</td><td rowspan="3">50</td><td rowspan="3">CO1, CO2, CO3, CO4, CO5</td></tr>
<tr><td>Design/ Drawing</td><td>Viva-voce</td></tr>
<tr><td>40</td><td>10</td></tr>
</table>

NOTE:

Literature survey will be a requirement for the Architectural Design study. Periodic review by external juror for subjects going for viva voce.

- For all viva voce examinations, one internal faculty and one external faculty will conduct the exam.
- Portfolios have to be submitted on the 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.**

SEMESTER – III

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY –III	
Course Code: AR302	**Course Credits: 0 : 0 : 4**
Prerequisite: Nil	**Contact hours: 4x15P**
Course Coordinators: Assistant. Prof.Megha Ann Jose	

Course Content

UNIT - I

Scaffolding and formwork:Materials used and scaffolding methods, its advantages, and disadvantages. Formwork for slabs, columns and beams, staircases

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - II

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - III

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - IV

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - V

Material study: Different types of floor finishes and applications. Introduction to AI-assisted material selection, performance comparison, sustainability assessment and visualization of flooring applications in architectural spaces

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

Reference books:

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 Edition2000
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. (PO1, PO5, PSO1)
2. Understand different types of foundations and columns used for RCC construction. (PO1, PO5, PO8, PSO1)
3. Demonstrate the construction of timber trusses. (PO1, PO3, PO5, PO8, PSO2, PSO1)
4. Analyze the composition, properties, grades and applications of concrete as a construction material. (PO1, PO8, PO10, PSO2)
5. Understand & evaluate different types of floor finishes based on their applications and material properties and make visualizations using AI-assisted tools. (PO8, PO9, PO10, PSO1, PSO2)

Course Assessment and Evaluation:

<table>
<tr><th colspan="4">Continuous Internal Evaluation (CIE): 50 Marks</th></tr>
<tr><th colspan="2">Assessment Tool</th><th>Marks</th><th>Course outcomes addressed</th></tr>
<tr><td colspan="2">Internal Test-I</td><td>30</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Internal Test-II</td><td>30</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4">Average of the two internal tests shall be taken for 30 marks.</td></tr>
<tr><td colspan="2">Other Components</td><td></td><td></td></tr>
<tr><td colspan="2">Assignment-1</td><td>10</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Assignment-2</td><td>10</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Semester End Examination (SEE):VIVA-VOCE</td><td rowspan="3">50</td><td rowspan="3">CO1, CO2, CO3, CO4, CO5</td></tr>
<tr><td>Portfolio</td><td>Viva-voce</td></tr>
<tr><td>40</td><td>10</td></tr>
</table>

NOTE:

- For all viva voce examinations, one internal faculty and one external faculty will conduct the exam.
- All students have to register on the first day at the beginning of the **Viva voce exam.**
- Portfolios have to be submitted on the 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.**

SEMESTER – III

THEORY OF ARCHITECTURE-I	
Course Code: AR303	**Course Credits: 3 : 0 : 0**
Prerequisite: Nil	**Contact Hours: 45L+45S**
Course Coordinator: Assoc. Prof. Sudha Kumari	

Course Content

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.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

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.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

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.

- Pedagogy / Course delivery tools-:Power Point Presentation, Chalk and talk.

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. Application of AI in the interpretation of architectural theory through appropriate case studies.

Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

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.

- Pedagogy / Course delivery tools-:Power Point Presentation, Chalk and talk.

Reference books:

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. Describe the primary elements, shapes and solids, and illustrate form transformations and ordering principles such as axis, symmetry and datum. (PO1, PO2, PO3, PO5, PSO1)
2. Explain scale and proportioning systems and apply unity, duality and rhythm in simple compositions. (PO1, PO2, PO3, PO5, PO10, PSO1)
3. Analyse built examples to categorise composition principles such as contrast, hierarchy, balance, harmony and vitality. (PO1, PO2, PO3, PO5, PO7, PSO1, PSO2)
4. Differentiate spatial relationships, organizations and ornamentation across architectural styles from prehistoric to renaissance, and compare them through AI-assisted visualization. (PO2, PO3, PO4, PO5, PO7, PSO1, PSO2)
5. Relate the physical and aesthetic properties of materials to the generation of form and develop a form concept that justifies the choice of material. (PO1, PO2, PO3, PO8, PO9, PO10, PSO1, PSO2, PSO3)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	**Marks**	**Course outcomes attained**
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment-1	10	CO1, CO2, CO3
Assignment-2	10	CO3, CO4, CO5
Semester-End Examination (SEE) (Scaled to 50 Marks)	100	CO1, CO2, CO3, CO4, CO5

SEMESTER – III

HISTORY OF ARCHITECTURE -III	
Course Code: AR304	**Course Credits: 3 : 0 : 0**
Prerequisite: Nil	**Contact Hours: 45L+45S**
Course coordinator: Prof. Dr. Monalisa B	

Course Content

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

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

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

- Pedagogy / Course delivery tools-:Power Point Presentation, Chalk and talk.

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

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

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- ud-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

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

UNIT - V

Provincial styles
Punjab - Influences & Architectural Character, Study of Tomb of Shah Rukn - I -A1am
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.
Introduction to AI applications in the interpretation of architectural history through appropriate case studies

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

Reference Books:

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. (PO1, PO2, PO3, PO5, PSO1)
2. Differentiate the architectural styles from early to later developments. (PO1, PO2, PO3, PO5, PSO1)
3. Understand and identify the architectural practices in central and northern parts of India during Hindu rulers. (PO1, PO2, PO3, PO5, PSO1)

4. Understand the development of Islamic architecture during different dynasties. (PO1, PO2, PO3, PO5, PSO1)
5. Study the evolution of the provincial styles of Islamic architecture in India. (PO1, PO2, PO3, PO5, PSO1)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	**Marks**	**Course outcomes attained**
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment-1	10	CO1, CO2, CO3
Assignment-2	10	CO3, CO4, CO5
Semester-End Examination (SEE) (Scaled to 50 Marks)	100	CO1, CO2, CO3, CO4, CO5

SEMESTER – III

ARCHITECTURAL STRUCTURES – III	
Course Code: AR305	**Course Credits: 3 : 0 : 0**
Prerequisite: Nil	**Contact Hours: 45L+45S**
Course coordinator: Assistant Prof. M. Vijayanand	

Course Content

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.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

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**.**

- Pedagogy / Course delivery tools-: Lecture and Numerical problems.

UNIT - III

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

- Pedagogy / Course delivery tools-: Lecture and Numerical problems.

UNIT - IV

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

- Pedagogy / Course delivery tools-: Lecture and Numerical problems.

UNIT - V

Introduction to RCC, PSC, Steel (only theory). Introduction to AI-assisted structural visualization, moment distribution verification, and comparative evaluation of RCC, PSC, and steel structural systems

- Pedagogy / Course delivery tools-: Lecture and AI integrated tools

References Books:

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 understand the classification of structures as determinate or indeterminate by calculating their static and kinematic indeterminacy. (PO8, PSO3)
2. Understand and compute slope and deflection of determinate beams using Macaulay's and moment area methods. (PO8, PO10, PSO3)
3. Understand and analyze the indeterminate structures using the consistent deformation method. (PO8, PSO3)
4. Analyze continuous beams and portal frames using the moment distribution method. (PO8, PSO3)
5. Compare RCC, PSC and steel systems and verify moment distribution results using AI-assisted tools. (PO1, PO8, PO10, PSO1, PSO3)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	**Marks**	**Course outcomes attained**
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment-1	10	CO1, CO2, CO3
Assignment-2	10	CO3, CO4, CO5
Semester-End Examination (SEE) (Scaled to 50 Marks)	100	CO1, CO2, CO3, CO4, CO5

SEMESTER – III

BUILDING SERVICES –I	
Course Code: AR306	**Course Credits: 3 : 0 : 0**
Prerequisite: Nil	**Contact Hours: 45L+45S**
Course coordinator: Assistant Prof. Amala Anna Jacob	

Course Content

UNIT - I

Introduction, per capita water demand, sources of water supply, qualitative and quantitative aspects.Water quality, physical, chemical, and bacteriological quality, drinking water standards. Water borne diseases.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

UNIT - II

Water Purification – Flow sheet of treatment plant – sedimentation, coagulation, filtration, slow sand filter, rapid sand filter and pressure filter. Disinfection - objective of disinfection, methods of disinfection, break point chlorination.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

UNIT - III

Distribution system – methods of layout of distribution pipes. Provision for firefighting – fire hydrants.Domestic water supply system – mains, ferrules, service pipe, water meter, sump, pumps, overhead tanks, distribution pipes, cold water and hot water supply for single and multistoried buildings. Pipe sizes, fittings, valves, types of taps. Rainwater harvesting.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

UNIT - IV

Introduction, importance and purpose of sanitation, methods of sanitation, definitions. Systems of drainage – separate, combined and partially separate system, advantages, and disadvantages of each system. Sanitary requirements for various types of buildings, types of pipes.Manholes – drop manholes, manhole with intercepting trap, inspection chambers, self-cleansing velocity. Sewage treatment- flow sheet, purposes of each unit.Sewage treatment and activated sludge process – trickling filter - sketch & description.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

UNIT V

House drainage – principles, traps-floor trap, multi-trap, gully trap, grease and oil trap, urinals, Indian, European, Anglo Indian type of water closets, squatting, urinal, wash basins, sink, bathtubs, flushing cistern. Systems of plumbing – single stack, one pipe, one pipe partially ventilated, two pipe disposal of wastewater from buildings. solid waste management. Typical plan of residence – showing all the traps, inspection chambers, pipes connected to public sewer lines. Septic tanks – soak pit, soak well, design aspects, disposal of effluent. oxidation ponds- Sketch & description. Introduction to AI-assisted analysis of water supply, waste water management and sustainable plumbing design in buildings.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk,AI integrated tools

Reference books:

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 sources of water supply and describe parameters of water quality and quantity. (PO2, PO9, PO11, PSO2, PSO3)
2. Explain various water treatment methods for the water supply system. (PO2, PO8, PO9, PSO2, PSO3)
3. Describe systems and components of water supply distribution in buildings and apply the concepts to illustrate a water supply scheme for buildings (PO1, PO5, PO8, PO9, PSO2, PSO3)
4. Describe systems and components of sewage treatment systems and apply the concepts to illustrate a sanitation scheme for buildings. (PO1, PO5, PO8, PO9, PO10, PSO2, PSO3)
5. Apply and analyze the building drainage system,plumbing and various fixtures available in the market to develop sustainable sanitation solutions, including the use of AI-assisted design and analysis tools. (PO1, PO5, PO8, PO9, PO10, PSO2, PSO3)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	**Marks**	**Course outcomes attained**
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment-1	10	CO1, CO2, CO3
Assignment-2	10	CO3, CO4, CO5
Semester-End Examination (SEE) (Scaled to 50 Marks)	100	CO1, CO2, CO3, CO4, CO5

SEMESTER – III

COMPUTERS IN ARCHITECTURE -II	
Course Code: AR307	**Course Credits: 0 : 0 : 1**
Prerequisite: Nil	**Contact Hours: 1x15P**
Course coordinator: System Analyst Er. Aruna Gopal	

Note: AI-generated report and portfolio shall be submitted at the end of the semester for the course assessment and evaluation pattern.

Course Content

UNIT - I

Introduction to AutoCAD & Workspace Fundamentals: Overview of the AutoCAD user interface and workspace navigation; setting up units and drawing limits; core 2D drawing tools (Line, Polyline, Circle, Arc, Rectangle, Polygon, Hatch); foundational drafting techniques. Practice exercises.

- Pedagogy / Course delivery tools-: -: Live Demonstration, Hands-on Practical Session.

UNIT - II

Geometric Editing, Precision Tools & Measurement: Execution of editing and modification commands (Move, Copy, Offset, Rotate, Mirror, Scale, Trim, Extend, Fillet, Array); drafting precision settings (Object Snaps, Grid, Polar Tracking); inquiry tools (Distance, Area, Radius) and drafting environment optimization.Practice exercises.

- Pedagogy / Course delivery tools-: -: Live Demonstration, Hands-on Practical Session.

UNIT - III

Drawing Organization & Layer Management: Structuring professional drawings; Layer Properties Manager; managing object attributes including line types, line weights, color coding, and layer visibility controls (Freeze, Lock, Hide). Sample project drawings.

- Pedagogy / Course delivery tools-: -: Live Demonstration, Hands-on Practical Session.

UNIT - IV

Annotations: Single and Multi line Texts & dimensions styles and types, Multi-leaders, custom settings.

- Pedagogy / Course delivery tools-: -: Live Demonstration, Hands-on Practical Session.

UNIT - V

Plotting & Presentation: Blocks, Layouts, page setup manager, plotting to scale, plot styles. Introduction to AI-assisted CAD layer management, drawing organization, automated quality

checking.

- Pedagogy / Course delivery tools-: -: Live Demonstration, Hands-on Practical Session.

References Books:

1. Engineering Drawing and Graphics Using Autocad - T Jeyapoovan
2. AutoCAD 2020: A project-based Tutorial - AutoCAD official website
3. Books Tutorial, 'AutoCAD 2020 A Project-Based Tutorial'; Kishore Publishers, 2020
4. T. Jeyapoovan, '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. Set up the AutoCAD workspace, units and limits, and use core 2D drawing tools to create basic architectural drawings. (PO1, PO3, PO5, PO10, PSO1, PSO3)
2. Apply editing, precision and inquiry tools to modify drawings accurately and measure geometry. (PO1, PO8, PO10, PSO1, PSO3)
3. Organize drawings using layers, line types, line weights and visibility controls to create CAD standards. (PO1, PO8, PO10, PO11, PSO1, PSO3)
4. Detail drawings with text, dimension styles and multi-leaders to communicate technical information. (PO1, PO8, PO10, PO11, PSO1, PSO3)
5. Present drawings using blocks, layouts and plotting to scale, and evaluate AI-assisted layer management and quality checking. (PO1, PO8, PO10, PO11, PSO1, PSO2, PSO3).

Course Assessment and Evaluation:

<table>
<tr><td colspan="4">Continuous Internal Evaluation (CIE): 50 Marks</td></tr>
<tr><td colspan="2">Assessment Tool</td><td>Marks</td><td>Course outcomes addressed</td></tr>
<tr><td colspan="2">Review-I</td><td>30</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Review-II</td><td>20</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Semester End Examination (SEE):TERM-WORK</td><td rowspan="3">50</td><td rowspan="3">CO1, CO2, CO3, CO4, CO5</td></tr>
<tr><td>PORTFOLIO SUBMISSION</td><td>AI REPORT</td></tr>
<tr><td>40</td><td>10</td></tr>
</table>

NOTE:

- For all Term work examinations, one internal faculty and one external faculty will conduct the exam
- Portfolios must be submitted on the prescribed date announced by the department for all subjects.
- All students must register on the first day of **Term work exams.**

SEMESTER – III

STUDY TOUR	
Course Code: AR308	**Course Credits: 0 : 0 : 2**
Prerequisite: Nil	**Contact Hours: 2x15P**
Course coordinator: Assistant. Prof. Sreesha Bhat	

Note: Submission of the sketchbook and portfolio is mandatory for the final assessment and evaluation.

Course Content

Unit I

Introduction to building documentation introduces the purpose and methods of building documentation, covering various documentation types such as photography, sketches, measured drawings, and note-taking. Participants learn to use documentation tools.

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

Unit II

Observation techniques to develop keen observation skills to capture architectural elements, spatial layouts, materials, and building conditions accurately. This includes practical exercises in detailed sketching and note-taking during any case study.

- Pedagogy / Course delivery tools-:Power Point Presentation, Chalk and talk.

Unit III

Site visits include conventional architectural styles, theories practiced through built spaces, and their evolution and influences. Measure Drawing and study of materials used to be an integral part of the site visits.

- Pedagogy / Course delivery tools-: Chalk and talk.

Unit IV

Measured drawing and technical recording,taking precise measurements on-site and translating them into hand-drawn sketches, with an optional introduction to CAD software for digital drafting.

- Pedagogy / Course delivery tools-: Chalk and talk.

Unit V

Combining visual and textual information effectively. This includes instruction on presentation techniques and case studies of exemplary documentation projects. Introduction to AI-assisted content organization, infographic development, presentation design, visual storytelling, image annotation, and digital documentation workflows

- Pedagogy / Course delivery tools-: Power Point Presentation, Chalk and talk.

Course Outcomes (COs):

The students will be able to -

1. Study and understand the necessity of building documentation. (PO2, PO3, PO5, PSO1)
2. Effective techniques for documenting buildings through sketches, notes, and photography. (PO2, PO5, PO8, PSO1)
3. Study and document different conventional-style buildings. (PO2, PO3, PO5, PSO1)
4. Represent different elements of architectural style and complete a measure drawing. (PO1, PO7, PO8, PSO1)
5. Translate ideas in the form of drawings and analysis. (PO2, PO4, PO6, PO7, PSO3)

Course Assessment and Evaluation:

<table>
<tr><td colspan="4">Continuous Internal Evaluation (CIE): 50 Marks</td></tr>
<tr><td colspan="2">Assessment Tool</td><td>Marks</td><td>Course outcomes addressed</td></tr>
<tr><td colspan="2">Review-I</td><td>30</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Review-II</td><td>20</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Semester End Examination (SEE): TERM-W0RK</td><td rowspan="3">50</td><td rowspan="3">CO1, CO2, CO3, CO4, CO5</td></tr>
<tr><td>PORTFOLIO</td><td>SKETCH BOOK</td></tr>
<tr><td>30</td><td>20</td></tr>
</table>

NOTE:

- International and National study tours will be arranged during the course.
- For all Term work examinations, one internal faculty and one external faculty will conduct the exam
- Portfolios must be submitted on the prescribed date announced by the department for all subjects.
- All students must register on the first day of **Term work exams.**

SEMESTER – IV

ARCHITECTURAL DESIGN – III	
Course Code: AR401	**Course Credits: 0 : 0 : 7**
Prerequisite: Nil	**Contact Hours:7x15P**
Course Coordinator: Assoc. Prof. Sudha Kumari	

Course Content

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. The 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.

- Pedagogy / Course delivery tools-:Power Point Presentation, Discussion, Chalk and talk.

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.

- Pedagogy / Course delivery tools-:Power Point Presentation, Discussion, Chalk and talk.

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

- Pedagogy / Course delivery tools-:Power Point Presentation, Discussion, Chalk and talk.

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. Introduction to

AI-assisted site analysis, master planning, accessibility evaluation, climate-responsive planning and conceptual design visualization.

UNIT - V

Drafting, rendering using different mediums; 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.

- Pedagogy / Course delivery tools-:Power Point Presentation, Discussion, Chalk and talk.

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

Reference books:

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. Explain the issues of human habitat, space standards and the socio-cultural needs of occupants in urban and rural housing contexts. (PO4, PO5, PO6, PO7, PO10, PSO2)
2. Interpret data from literature surveys, behavioural studies and neighbourhood case studies to analyse shared land, spaces, services and community needs as a basis for design decisions. (PO2, PO4, PO5, PO6, PO7, PSO1, PSO2)
3. Apply site analysis and zoning to develop a housing concept that responds to privacy, public-to-private transitions and the social and cultural context. (PO1, PO2, PO3, PO4, PO5, PO7, PO8, PO9, PSO1, PSO2)

4. Design a master plan with building footprints, roads and open spaces, and prepare detailed plans, sections, elevations and models, using AI-assisted tools for site, accessibility and climate-responsive analysis. (PO1, PO4, PO8, PO9, PO10, PO11, PSO1, PSO2, PSO3)
5. Integrate drawings, renderings and manual models into a final presentation, and justify design decisions for inclusive use by the disabled, aged and children. (PO1, PO3, PO5, PO6, PO10, PSO1, PSO2, PSO3)

Course Assessment and Evaluation:

<table>
<tr><th colspan="4">Continuous Internal Evaluation (CIE): 50 Marks</th></tr>
<tr><th colspan="2">Assessment Tool</th><th>Marks</th><th>Course outcomes addressed</th></tr>
<tr><td colspan="2">Review-I</td><td>30</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Review-II</td><td>20</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="2">Semester End Examination (SEE):VIVA-VOCE</td><td rowspan="3">50</td><td rowspan="3">CO1, CO2, CO3, CO4, CO5</td></tr>
<tr><td>Design/ Drawing</td><td>Viva-voce</td></tr>
<tr><td>40</td><td>10</td></tr>
</table>

NOTE:

- Literature survey will be a requirement for the Architectural Design study. Periodic reviews will be conducted by external jurors for subjects going for Term work/ viva voce.
- For all viva voce examinations, one internal faculty and one external faculty will conduct the exam.
- Portfolios have to be submitted on the 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.**

SEMESTER – IV

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY -IV	
Course Code: AR402	**Course Credits: 0 : 0 : 4**
Prerequisite: Nil	**Contact Hours:4x15P**
Course Coordinator: Assistant Prof. Shwetha.P.E	

Course Content

UNIT - I

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - II

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - III

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - IV

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

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. Introduction to AI-assisted construction sequencing, reinforcement visualization, material selection, performance comparison, sustainability assessment.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

Reference books:

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- Shamsher 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. Explain and illustrate the fundamental technology used in the construction of slabs with short spans. (PO1, PO8, PO9, PO10, PSO1, PSO2, PSO3)
2. Apply and analyse the technicalities, details and characteristics of RCC slab construction. (PO1, PO8, PO9, PO10, PO11, PSO1, PSO2, PSO3)
3. Select and use indigenous materials in the design and detailing of slabs. (PO1, PO8, PO9, PO10, PSO1, PSO2, PSO3)
4. Analyse load paths and model construction methods to design non-conventional roof forms. (PO1, PO8, PO9, PO10, PSO1, PSO2, PSO3)
5. Apply principles of deep foundations and describe the properties and characteristics of wall finishes and plastering. (PO1, PO8, PO9, PO10, PO11, PSO1, PSO2, PSO3)

Course Assessment and Evaluation:

<table>
<tr><td colspan="4">Continuous Internal Evaluation (CIE): 50 Marks</td></tr>
<tr><td colspan="2">Assessment Tool</td><td>Marks</td><td>Course outcomes addressed</td></tr>
<tr><td colspan="2">Internal Test-I</td><td>30</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Internal Test-II</td><td>30</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4">Average of the two internal tests shall be taken for 30 marks.</td></tr>
<tr><td colspan="2">Other Components</td><td></td><td></td></tr>
<tr><td colspan="2">Assignment-1</td><td>10</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Assignment-2</td><td>10</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Semester End Examination (SEE):VIVA-VOCE</td><td rowspan="3"></td><td rowspan="3">CO1, CO2, CO3, CO4, CO5</td></tr>
<tr><td>Portfolio</td><td>Viva-voce</td></tr>
<tr><td>40</td><td>10</td></tr>
<tr><td colspan="3">50</td><td></td></tr>
</table>

NOTES:

- For all Term work examinations, one internal faculty and one external faculty will conduct the exam
- Portfolios must be submitted on the prescribed date announced by the department for all subjects.
- All students must register on the first day of **Term work exams.**

SEMESTER – IV

THEORY OF ARCHITECTURE II	
Course Code: AR403	**Course Credits: 3 : 0 : 0**
Prerequisite: Nil	**Contact Hours:45L+ 45S**
Course Coordinator: Assistant Prof. Sreesha Bhat	

Course Content

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - II

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

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.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation, Videos

UNIT - V

Research-oriented: Architectural thought – Amos Rappaport & Geoffrey Broadbent, Architectural criticism overview. Introduction to contemporary AI applications in the interpretation of architectural theory through appropriate case studies.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Video

Reference books:

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

Course outcomes (COs):

The students will be able to -

1. Identify the evolution of thoughts and trends across the timeline of Western Architecture. (PO2, PO3, PO5, PSO1, PSO2)
2. Study the important events that affect the built forms and its transition. (PO2, PO5, PO6, PSO1, PSO2)
3. Understand the concepts of various architects across the Modern movement. (PO1, PO2, PO3, PSO1, PSO2)
4. Identify the evolution of thoughts and trends across the timeline of western architecture. (PO2, PO3, PO6, PSO1, PSO2)
5. Analyze architectural criticism and use AI tools for research analysis and visualization. (PO2, PO6, PO7, PSO2, PSO3)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	**Marks**	**Course outcomes attained**
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment-1	10	CO1, CO2, CO3
Assignment-2	10	CO3, CO4, CO5
Semester-End Examination (SEE) (Scaled to 50 Marks)	100	CO1, CO2, CO3, CO4, CO5

SEMESTER – IV

CLIMATE RESPONSIVE ARCHITECTURE	
Course Code: AR404	**Course Credits: 0 : 0 : 3**
Prerequisite: Nil	**Contact Hours:3x15P**
Course Coordinator: Assoc. Prof. Divya Susanna Ebin	

Note: The portfolio and model shall be submitted at the end of the semester as mandatory components of the final assessment and evaluation.

Course Content

UNIT - I

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Videos

UNIT - II

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

- Pedagogy / Course delivery tools-: Chalk and talk,Power Point Presentation & Videos

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.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Videos

UNIT - IV

Effect of landscape elements and site topography.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Videos

UNIT - V

Design considerations: Design consideration for various climatic zones of India with respect to shading devices, day light factor, rain etc.Digital Environmental Design Tools: Introduction to climate-responsive design using Climate Consultant, SunCalc/Andrew Marsh Sun-Path Tool, Autodesk Revit, Autodesk Forma, and AI-assisted design exploration.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation &

Videos

Reference books:

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. Define the basic principles of various climatic systems. (PO1, PO2, PO3, PO7, PO9, PSO1, PSO2, PSO3)
2. Discuss thermal comfort techniques in designing built spaces. (PO1, PO2, PO3, PO7, PO9, PO10, PSO1, PSO2, PSO3)
3. Associate natural ventilation and daylighting for built spaces. (PO1, PO2, PO3, PO7, PO9, PO10, PSO1, PSO2, PSO3)
4. Examine the impact of landscape elements in the site context and design accordingly. (PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PSO1, PSO2, PSO3)
5. Analyse various climatic responsive strategies to create design solutions for different climatic zones. (PO1, PO2, PO3, PO4, PO6, PO7, PO9, PO10, PO11, PSO1, PSO2, PSO3)

Course Assessment and Evaluation:

<table>
<tr><td colspan="4">Continuous Internal Evaluation (CIE): 50 Marks</td></tr>
<tr><td colspan="2">Assessment Tool</td><td>Marks</td><td>Course outcomes addressed</td></tr>
<tr><td colspan="2">Assignment -I</td><td>30</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Assignment -II</td><td>20</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Semester End Examination (SEE): TERM-WORK</td><td rowspan="3">50</td><td rowspan="3">CO1, CO2, CO3, CO4, CO5</td></tr>
<tr><td>PORTFOLIO</td><td>MODEL</td></tr>
<tr><td>40</td><td>10</td></tr>
</table>

NOTE:

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- All students must register on the first day of **Term work exams.**

SEMESTER – IV

ARCHITECTURAL STRUCTURES-IV	
Course Code: AR405	**Course Credits: 3 : 0 : 0**
Prerequisite: Nil	**Contact Hours:45L+ 45S**
Course Coordinator: Asst. Prof. M. Vijayanand	

Course Content

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

- Pedagogy / Course delivery tools-:Lecture and Numerical Problems

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

- Pedagogy / Course delivery tools-: Lecture and Numerical Problems

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

- Pedagogy / Course delivery tools-: Lecture and Numerical Problems

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.

- Pedagogy / Course delivery tools-: Lecture and Numerical Problems

UNIT - V

Limit state design of Footing –. Structural grid framing and Loads on foundation, types of footing. Introduction to AI-assisted structural calculations, footing selection, reinforcement detailing, code interpretation, design verification.

- Pedagogy / Course delivery tools-: Lecture ,Numerical Problems and AI integrated tools.

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.

Reference books:

1. Analysis and Design of Substructures Limit State Design - Saran S
2. 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. (PO1, PO8, PSO3)
2. Analyse, design and draw detailing of singly, doubly reinforced beams and analyze T- beams. (PO1, PO8, PO10, PSO3)
3. Analyse, design and draw detailing of slabs and stairs. (PO1, PO8, PO10, PSO3)
4. Analyse, design and draw detailing of columns. (PO1, PO8, PO10, PSO1, PSO3)
5. Analyse, design and draw detailing of footings with manual and AI-assisted tools. (PO1, PO8, PO10, PSO1, PSO3)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	**Marks**	**Course outcomes attained**
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment-1	10	CO1, CO2, CO3
Assignment-2	10	CO3, CO4, CO5
Semester-End Examination (SEE) (Scaled to 50 Marks)	100	CO1, CO2, CO3, CO4, CO5

SEMESTER – IV

BUILDING SERVICES II	
Course Code: AR406	**Course Credits: 3 : 0 : 0**
Prerequisite: Nil	**Contact Hours: 45L +45S**
Course Coordinator: Prof. Jotirmay Chari	

Course content

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.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Videos

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.

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Videos

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Videos

UNIT - IV

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

- Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Videos

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. Introduction to AI-assisted fire risk assessment tools.

Pedagogy / Course delivery tools-: Chalk and talk, Power Point Presentation & Videos

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

Reference books:

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

Course outcomes (COs):

The students will be able to -

1. Apply and assess principles of the electrical load and outline electrical supply and distribution requirements for any building. (PO1, PO8, PO9, PSO1)
2. Classify the various types of cables used in internal wiring. Select systems for internal wiring by understanding their characteristics and applications (PO1, PO8, PO9, PSO1)
3. Infer lighting requirements for different buildings and predict lighting-design principles and calculations, and evaluate suitable lighting schemes (PO1, PO3, PO8, PO9, PSO1)
4. Estimate the electrical load for a building and recommend electrical distribution schemes for buildings (PO1, PO8, PO9, PSO1)
5. Examine firefighting norms and select fire-safety requirements while designing a building (PO3, PO9, PO10, PSO1, PSO3)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	**Marks**	**Course outcomes attained**
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment-1	10	CO1, CO2, CO3
Assignment-2	10	CO3, CO4, CO5
Semester-End Examination (SEE) (Scaled to 50 Marks)	100	CO1, CO2, CO3, CO4, CO5

SEMESTER – IV

COMPUTERS IN ARCHITECTURE-III	
Course Code: AR407	**Course Credits: : 0: 0 : 1**
Prerequisite: Nil	**Contact Hours:1x15P**
Course Coordinator: System Analyst Er. Aruna Gopal	

NOTE: Submission of the portfolio and a 3D model/3D-printed model is mandatory for the final assessment and evaluation.

Course content

Unit I

Introduction to the software application and User Interface. Navigational tools, importing AutoCAD, PDF and other formats. Fundamental tools and commands for an architectural project. Creating and modelling building elements like walls, windows, doors, components, floors etc.

- Pedagogy / Course delivery tools-: Live Demonstration, Hands-on Practical Session

Unit II

Creating and modelling ceilings, Stairs, ramps, railings and roofs. Developing floor plans, sections, elevations, camera views, 3D sectional views. Modifying and editing tools for modelling building elements**.**

- Pedagogy / Course delivery tools-:Live Demonstration, Hands-on Practical Session

Unit III

Creating and applying materials, creating Schedules and material take off. Massing and Site topography Tools**.** 3D printing of a massing form.

- Pedagogy / Course delivery tools-: Live Demonstration, Hands-on Practical Session

Unit IV

Image rendering techniques . Annotations, dimensions, tags and text commands. Complete a project using the above knowledge. Sheet composition , export and print commands.

- Pedagogy / Course delivery tools-: Live Demonstration, Hands-on Practical Session

Unit V

Image editing tools and presentation techniques for Architectural works. Introduction to AI-assisted rendering, annotation automation, drawing quality review, sheet composition, presentation layout optimization

- Pedagogy / Course delivery tools-:Live Demonstration, Hands-on Practical Session

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. (PO1, PO8, PO11, PSO1, PSO3)
2. Apply the software tools to visualize projects in 3D space. (PO1, PO10, PSO1, PSO3)
3. Apply the techniques for conceptual massing forms and generate views of a project. (PO1, PO7, PSO1, PSO2)
4. Apply the software to get rendered views for design presentations. (PO1, PO3, PSO1)
5. Create design presentations and compositions using image editing applications and AI tools. (PO1, PO3, PSO1, PSO2, PSO3)

Course Assessment and Evaluation:

<table>
<tr><th colspan="4">Continuous Internal Evaluation (CIE): 50 Marks</th></tr>
<tr><th colspan="2">Assessment Tool</th><th>Marks</th><th>Course outcomes addressed</th></tr>
<tr><td colspan="2">Review-I</td><td>30</td><td>CO1, CO2, CO3</td></tr>
<tr><td colspan="2">Review-II</td><td>20</td><td>CO3, CO4, CO5</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Semester End Examination (SEE):TERM-WORK</td><td rowspan="3">50</td><td rowspan="3">CO1, CO2, CO3, CO4, CO5</td></tr>
<tr><td>PORTFOLIO SUBMISSION</td><td>3D PRINTED MODELI / 3D MODEL</td></tr>
<tr><td>40</td><td>10</td></tr>
</table>

NOTE:

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- All students must register on the first day of **Term work exams.**

SEMESTER – IV

CONSTITUTIONAL LAW	
Course Code: AR408	**Course Credits: 1 : 0 : 0**
Prerequisite: Nil	**Contact Hours:15L+15S**
Course Coordinator: Humanities Department	

Course Content

UNIT - I

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

- Pedagogy / Course delivery tools-: Chalk and talk

UNIT - II

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

- Pedagogy / Course delivery tools-: Chalk and talk

UNIT - III

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

- Pedagogy / Course delivery tools-: Chalk and talk

UNIT - IV

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

- Pedagogy / Course delivery tools-: Chalk and talk

UNIT - V

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

- Pedagogy / Course delivery tools-: Chalk and talk

Reference books:

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. (PO2, PSO2, PSO3)
2. Identify various provisions of Directive Principles of state policies and fundamental duties. (PO2, PSO2, PSO3)
3. Explain the powers of the executive and legislature. (PO6, PSO2, PSO3)
4. Explain the powers of the judicial system. (PO2, PSO2, PSO3)
5. Analyse and implement certain laws as a citizen and as a professional. (PO6, PSO2, PSO3)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	**Marks**	**Course outcomes attained**
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment-1	10	CO1, CO2, CO3
Assignment-2	10	CO3, CO4, CO5
Semester-End Examination (SEE) (Scaled to 50 Marks)	100	CO1, CO2, CO3, CO4, CO5