RAMAIAH
Institute of Technology

# CURRICULUM

## (For the Academic Year 2025-2026)

## SCHOOL OF ARCHITECTURE

## III & IV SEMESTER M. ARCH (ADVANCED ARCHITECTURE

**RAMAIAH INSTITUTE OF TECHNOLOGY**
(Autonomous Institute, Affiliated to VTU)
**BANGALORE -54**

## 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 13 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 faculties 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. **Ramaiah Institute of Technology has obtained All India Rank 182 in "Scimago Institutions Rankings" for the year 2024.**

The Entrepreneurship Development Cell (EDC) and Section 8 company "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, Ramaiah Institute of Technology has achieved 75$^{th}$ rank among 1463 top Engineering Institutions & 21$^{st}$ Rank for School of Architecture in India among 115 Architecture Institutions, for the year 2024.**

## 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 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 mold 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

**RIT 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 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 center of architectural education and innovation, addressing global challenges through interdisciplinary research cultivating visionary designers who shape resilient, inclusive, and sustainable environments for societal wellbeing.

## MISSION OF THE DEPARTMENT

- The school's commitment is to prepare competent architects trained for design excellence and modern technological knowledge through a competitive teaching learning process.
- To provide 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.
- To inculcate a strong sense of social responsibility by developing sustainable design solutions to meet the changing and create innovative designs and technologies.

## PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

**PEO1:** Use the knowledge and skills of Advanced Architecture to analyze real life problems and interpret the results.
**PEO2:** Effectively design, implement, improve and manage the integrated socio-technical systems.
**PEO3:** Build and lead cross-functional teams, upholding the professional responsibilities and ethical values.
**PEO4:** Engage in continuing education and life-long learning to be competitive and enterprising.

## PROGRAM OUTCOMES (POs):

**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:** Apply interdisciplinary knowledge of art, science, materials, and environmental technologies to design and develop architectural projects that are sustainable, context-sensitive, and aligned with ecological and functional needs.

**PSO2:** Identify, formulate, and address complex challenges in the industrial and service sector through sustainable design strategies, while critically evaluating their societal, cultural, and global impacts.

**PSO3:** Demonstrate ethical and professional responsibility in leading sustainable project planning and construction management, using innovative tools and technologies to realize inclusiveness, resilience, and low-impact built environments.

**BOARD OF STUDIES FOR THE TERM 2025 – 2026**

| Sl.no | Name | Designation |
|---|---|---|
| 1 | Prof. Dr. Rajshekhar Rao | 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 RS | Academician |
| 6 | Dr. Chidambara Swamy | Academician |
| 7 | Ar. Subbiah T S | Alumni External Industry Expert |
| 8 | Dr. Anup Naik | Member |
| 9 | Ar. Prem Chandavarkar | Member |
| 10 | Dr. Rashmi Niranjan | Member |
| 11 | (Dr.) Meghana K Raj | Member |
| 12 | Er. (Dr) Vijayanand M | Member |

## SCHOOL OF ARCHITECTURE

## TEACHING STAFF

| Sl No | Name | Qualification | Designation |
|---|---|---|---|
| 1 | Prof. Dr. Rajshekhar Rao | M. Arch (Landscape Architecture) PhD | Professor & HOD |
| 2 | Dr. Monalisa Bhardwaj | M.Arch (General Architecture) PhD | Associate Professor |
| 3 | Ashwini Mani | M.Arch (Advanced Architecture) | Tenure Faculty |
| 4 | (Dr.) Akshata Shagoti | M.Arch (Architectural Design) | Assistant Professor |

## ADMINISTRATIVE STAFF

| | | | |
|---|---|---|---|
| 1 | Mr. Nagesh B.L | Dip. in Mech. Engg. | Instructor |
| 2 | Ms. Swathi | M.com | SDA |

## SUPPORT STAFF

| | | |
|---|---|---|
| 1 | Mr. Ramachandra Chari | Attender |
| 2 | Mrs. Parvathy | Attender |

**(ADVANCED ARCHITECTURE)**

| M. Arch (Advanced Architecture)<br>Scheme of Teaching & Examination 2025 -2026 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **III- Semester** | | | | | | | | | | |
| | **Code** | **Subject** | **L** | **T** | **P** | **Total Credits** | **Contact Hours** | **Examination** | **CIE Marks** | **SEE Marks** |
| PCC | AA 301 | THESIS PROJECT | 0 | 0 | 12 | 12 | 12 | SEE (Viva-voce) | 50 | 50 |
| PSC | AA 302 | ADVANCED BUILDING SYSTEMS INTEGRATION | 0 | 0 | 3 | 3 | 3 | SEE | 50 | 50 |
| PCC | AA 303 | PROJECT MANAGEMENT | 1 | 0 | 1 | 2 | 3 | SEE | 50 | 50 |
| PEC | AA 304 | ELECTIVE-III | 3 | 0 | 0 | 3 | 3 | SEE (Term work) | 50 | 50 |
| | | **Total** | | | | **20** | **21** | | | |
| Note: PCC: Professional Core, PSC: Professional Support, PEC: Professional Elective. | | | | | | | | | | |

| **Professional Elective III** | | | |
|---|---|---|---|
| | **Course Code** | **Course title** | **Credits** |
| 1. | AA E07 | Impact Assessment of Environment | 3:0:0 |
| 2. | AA E08 | Virtual Reality and Augmented Reality in Architecture | 3:0:0 |
| 3 | AA E09 | Advanced Theory of Design: Architecture and Human Settlements, Theory of Urbanism, Landscape Urbanism | 3:0:0 |

**Evaluation Pattern: Marks allocation for SEE Viva Voce**

| **Subject Code** | **Subject** | **Design** | **Viva Voce** | **Total** |
|---|---|---|---|---|
| AA 301 | THESIS PROJECT | 40 | 10 | 50 |

**(ADVANCED ARCHITECTURE)**

| M. Arch (Advanced Architecture)<br>Scheme of Teaching & Examination 2025 -2026 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **IV- Semester** | | | | | | | | | | |
| | **Code** | **Subject** | **L** | **T** | **P** | **Total Credits** | **Contact Hours** | **Examination** | **CIE Marks** | **SEE Marks** |
| PCC | AA 401 | PRACTICAL TRAINING | 0 | 0 | 17 | 17 | 17 | SEE<br>Viva Voce | 50 | 50 |
| PEC | AA 402 | ELECTIVE-IV | 0 | 0 | 3 | 3 | 3 | SEE | 50 | 50 |
| | | **Total** | | | | 20 | 20 | | | |

**Evaluation Pattern: Marks allocation for SEE Viva Voce**

| **Professional Elective III** | | | |
|---|---|---|---|
| | **Course Code** | **Course title** | **Credits** |
| 1. | AA E010 | Legal Aspects & Legislation | 3:0:0 |
| 2. | AA E011 | Parametric urban mapping | 3:0:0 |
| 3 | AA E012 | Project Resource Management | 3:0:0 |

| **Subject Code** | **Subject Name** | **Portfolio** | **Viva Voce** | **Total** |
|---|---|---|---|---|
| AA 401 | Practical Training **(**SEE Viva Voce**)** | 40 | 10 | 50 |

**SEMESTER –III**

| **THESIS PROJECT** | |
|---|---|
| **Course Code:** AA 301 | **Credits:** 0:0:10 |
| **Prerequisite: Nil** | **Contact Hours: 12** |
| **Course Coordinator:** | |

**Course objectives:**

- Take up a thesis topic of their choice and apply the knowledge of various subjects while working towards a design solution addressing the technical, environmental, and sustainability factors.
- To tackle issues relating to Building performance.

**Course Contents:**

**UNIT I**

Selection of thesis topic: Relevance and justification- Preparation of Synopsis with aims, objectives, limitations, and scope.

**UNIT II**

Literature Case study and documentation, formulate a methodology for the project.

**UNIT III**

Analysis and synthesis of data: Design development, sustainability.

**UNIT IV**

Innovation in design: Innovative solutions with technical execution and performance analysis.

**UNIT V**

Structuring a comprehensive thesis report: critical analysis, conclusions and recommendations.

**Course outcomes (COs):**

The student will be able to

**CO1 -** Analyze the relevance of a thesis topic, justify its selection, and formulate clear and structured aims, objectives, limitations and scope.
**CO2 -** Evaluate case studies and existing literature to develop a well-defined methodology for their project.
**CO3 -** Apply techniques for data analysis and synthesis to develop a sustainable design solution addressing project requirements.
**CO4 -** Create innovative design solutions that incorporate technical execution and performance analysis for real-world challenges.

**CO5 -** Structure a comprehensive thesis report by demonstrating an understanding of critical analysis, conclusions and recommendations.

**References:**


1. Groat, L., & Wang, D. *Architectural Research Methods*. Wiley, 2013.
2. Creswell, J. W., & Creswell, J. D. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications, 2018.
3. Neuman, W. L. *Social Research Methods: Qualitative and Quantitative Approaches*. Pearson, 2014.
4. Blessing, L. T. M., & Chakrabarti, A. *DRM, a Design Research Methodology*. Springer, 2009.
5. Yin, R. K. *Case Study Research and Applications: Design and Methods*. SAGE Publications, 2018.
6. Lawson, B. *How Designers Think: The Design Process Demystified*. Architectural Press, 2006.
7. Bryan, B., & Erskine, J. *Design Studio: Crafting Creative Processes*. Routledge, 2013.
8. Biggs, J., & Tang, C. *Teaching for Quality Learning at University*. McGraw-Hill Education, 2011.
9. Lang, J., & Moleski, W. H. *Functionalism Revisited: Architectural Theory and Practice and the Behavioral Sciences*. Routledge, 2017.
10. Borden, I., & Ruedi, K. *The Dissertation: An Architecture Student's Handbook*. Routledge, 2014.


**Evaluation Pattern: Marks allocation for SEE (Viva Voce)**

| Subject Code | Subject | Design | Viva Voce | Total |
|---|---|---|---|---|
| AA 301 | THESIS PROJECT | 40 | 10 | 50 |

**SEMESTER-III**

| ADVANCED BUILDING SYSTEMS INTEGRATION | |
|---|---|
| **Course Code:** AA 302 | **Credits:** 0:0:3 |
| **Prerequisite: Nil** | **Contact Hours:** 3 |
| **Course Coordinator:** | |

**Course objectives:**

The subject equips students with the knowledge to design and integrate advanced systems that enhance the overall functionality, sustainability, and efficiency of buildings.

**Course Contents:**

**UNIT I**

Building Envelope and Passive and Active Systems. Understand fundamental relationships between energy, environment and building envelope.

**UNIT II**

Renewable energy systems in smart buildings, Adaptive and scalable systems, Urbanization challenges, Climate-resilient building systems.

**UNIT III**

BIM integration, System coordination, building automation. Mechanical, Electrical, and Plumbing (MEP) systems.

**UNIT IV**

Smart technologies, IoT, performance optimization, Sensors and actuators, AI and machine learning in automation

**UNIT V**

Energy efficiency, sustainability, energy-saving technologies, green systems, real-time monitoring. Future-ready technology integration.

**Course outcomes (COs):**

The student will be able to

**CO1 -** Explain the fundamental relationships between energy, the environment, and the building envelope to optimize thermal performance and sustainability.

**CO2 -** Apply principles of renewable energy systems and adaptive technologies to develop climate-resilient and scalable building solutions.

**CO3 -** Analyze the integration of BIM, MEP systems, and automation processes to ensure effective system coordination and operational efficiency in building projects.

**CO4 -** Evaluate the performance of smart building technologies, including IoT, AI, and sensors, for real-time optimization and automation.

**CO5 -** Create innovative, energy-efficient, and sustainable building designs that incorporate real-time monitoring and future-ready technologies.

**References:**


1. Banham, R. *The Architecture of the Well-Tempered Environment*. University of Chicago Press, 1984.
2. Givoni, B. *Passive and Low Energy Cooling of Buildings*. Wiley, 1994.
3. Szokolay, S. V. *Introduction to Architectural Science: The Basis of Sustainable Design*. Routledge, 2014.
4. Ramaswamy, M. *Mechanical and Electrical Equipment for Buildings*. Wiley, 2019.
5. Kwok, A. G., & Grondzik, W. T. *The Green Studio Handbook: Environmental Strategies for Schematic Design*. Routledge, 2018.
6. Eastman, C., Teicholz, P., Sacks, R., & Liston, K. *BIM Handbook: A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers*. Wiley, 2018.
7. Yudelson, J. *Green Building A to Z: Understanding the Language of Green Building*. New Society Publishers, 2007.

| PROJECT MANAGEMENT | |
|---|---|
| **Course Code:** AA 303 | **Credits: 1:0:1** |
| **Prerequisite: Nil** | **Contact Hours:** 3 |
| **Course Coordinator:** | |

**Course objectives**: To disseminate the application of Project Management in various phases of project embracing processes.

**Course Contents:**

**UNIT I**

Introduction to project management: Introduction to project, its stages, and construction project management: project, organization, need for management of building/construction projects, principles and objectives of project management, brief understanding about study areas in project management. Types of construction projects. Project, program, and portfolio management, difference between a Project manager and a project engineer/project leader, The duties of a project manager/project leader, project life cycle, and project management process.

**UNIT II**

Basics of project management: Project life cycle, types of projects, phase of project, project management and its relevance, stakeholders of a project, structure of project organization, management levels, failures, and success of a project.

**UNIT III**

Roles of Project Manager: Roles & Responsibilities of Project/ Construction Managers, Scope Management in Construction: Scope Planning, Definition, Verification, and Control Project Management Stages: Project planning, project scheduling, and project controlling.

**UNIT IV**

Project planning & scheduling: Introduction, time cost, and resource management, project planning, work breakdown structure (W.B.S.), planning terminologies, time scheduling techniques, network theories -CPM, PERT, project crashing.

**UNIT V**

Project monitoring and control: Introduction, scope verification & control, feasibility report, schedule control, cost control, quality control, performance reporting, risk control and contract administration.

**Course outcomes (COs):**

The student will be able to

**CO1 –** Understand the comprehensive concepts of project management, stages of a project, and principles required for successful project execution.
**CO2 –** Evaluate the factors contributing to project success or failure and apply management techniques to oversee projects across various phases and organizational levels.
**CO3 –** Understand the roles of the Project Manager, and effectively manage scope through planning and Project managing phases.
**CO4 –** Identify the required technology in project planning.

**CO5 -** Demonstrates the projects effectively including the management of scope, time, cost, and quality satisfying the needs for which the project was undertaken.

**References:**


1. Association for Project Management. *APM Body of Knowledge*. Association for Project Management, 2012.
2. Guide, A. *Project Management Body of Knowledge (PMBOK® Guide)*. Project Management Institute, 2017.
3. Krishnamurthy, K.G., and Ravindra, S.V. *Construction and Project Management*. 2008.
4. Hendrickson, C., Hendrickson, C.T., and Au, T. *Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects, and Builders*. Chris Hendrickson, 1989.
5. Hendrickson, C. *Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects, and Builders*. Department of Civil and Environmental Engineering, 2003.
6. Punmia, B.C., and Khandelwal, K.K. *Project Planning and Control with PERT & CPM*. Firewall Media, 2002.
7. Jha, K.N. *Construction Project Management: Theory and Practice*. Pearson Education India, 2015.

| ELECTIVE-III (AA E07- Impact Assessment of Environment) | |
|---|---|
| **Course Code:** AA 304 | **Credits:** 3:0:0 |
| **Prerequisite: Nil** | **Contact Hours:** 3 |
| **Course Coordinator:** | |

**Course objectives:**

This course provides a comprehensive understanding of environmental management, environmental planning, and management techniques.

**Course Contents:**

**UNIT I**

Introduction to environmental management; concepts of ecosystem; ethics and environment; environmental management tools. Environmental movements in the world. Environmental pollution and environmental concerns in India. Impact of human settlements, industries, dams, national parks, etc. on the environment. Evolution of EIA across the world and India.

**UNIT II**

Environmental Impact Assessment - Definitions, purpose, steps, hierarchy, impact indicators and forecasting environmental changes. Strategic environmental assessment (SEA): Rationale and scope, process, benefits and constraints. Environmental clearance procedure in India.

**UNIT III**

EIA documentation and processes: Stages; impact prediction, evaluation, and mitigation; impact on decisions; public participation; requisites and review of EIS.

**UNIT IV**

Environmental management plan – strategies, approaches of environmental protection. Environmental monitoring. Environmental auditing: Objectives and scope, types, methodology.

**UNIT V**

EIA notifications by MoEF CC. Environmental and town planning legislations dictating the EIA procedures: (Air act; Water act, EPA act). Role of a landscape architect in EIA.

**Course outcomes (COs):**

The student will be able to

**CO1**- Explain the fundamental concepts of environmental management, including ecosystem ethics, environmental tools, and the evolution of EIA globally and in India.

**CO2**- Analyze the steps, hierarchy, and processes involved in Environmental Impact Assessment, including Strategic Environmental Assessment and environmental clearance procedures in India.

**CO3**- Evaluate EIA documentation processes such as impact prediction, mitigation, public participation, and Environmental Impact Statements (EIS).

**CO4**- Apply environmental management strategies and monitoring methods, including environmental auditing, to develop comprehensive environmental protection plans.

**CO5**- Create integrated solutions addressing environmental challenges by synthesizing knowledge of MoEF & CC notifications, legislative frameworks, and the role of landscape architects in EIA.

**References:**


1. Spens, M. The Complete Landscape Design and Gardens of Geoffrey Jellicoe. Thames & Hudson, 1994.
2. Turnbull, W. Jr. The Poetics of Gardens. MIT Press, 1992.
3. Glasson, J., Therivel, R., & Chadwick, A. Introduction to Environmental Impact Assessment. Routledge, 2013.
4. Canter, L. W. Environmental Impact Assessment. McGraw-Hill, 1996.
5. Sadler, B., & McCabe, M. Strategic Environmental Assessment: Concepts and Practices. Earthscan, 2002.
6. Noble, B. F. Introduction to Environmental Impact Assessment: A Guide to Principles and Practice. Oxford University Press, 2014.

| ELECTIVE-III<br>(AA E08- Virtual Reality and Augmented Reality in Architecture (VR & AR) | |
|---|---|
| **Course Code:** AA 304 | **Credits:** 3:0:0 |
| **Prerequisite: Nil** | **Contact Hours:** 3 |
| **Course Coordinator:** | |

**Course objectives:**
The course aims to explore the use of Virtual Reality and Augmented Reality in architecture for immersive visualization, interactive design walkthroughs, client presentations, site planning, and real-time collaboration.

**Course Contents:**

**UNIT I**
Learn the basics of Virtual Reality (VR) and Augmented Reality (AR), their tools, and applications in design. Explore VR platforms for immersive environments and AR tools for site planning and client presentations. Understand the technology behind these immersive experiences.

**UNIT II**
Create immersive 3D models and design walkthroughs for real-time architectural exploration. Implement best practices for lighting, texture, and navigation in virtual environments.

**UNIT III**
Apply VR/AR in site planning to overlay digital models on real-world environments for analysis. Create interactive models that allow users to explore and modify design elements in real time.

**UNIT IV**
Develop real-time interaction in immersive environments for design feedback and changes. Visualize construction processes, timelines, and site visits using VR/AR. Enhance collaboration and communication during construction and design phases.

**UNIT V**
Use VR/AR for remote collaboration and real-time design iteration with multiple stakeholders. Engage clients through immersive presentations, virtual staging, and real-time feedback loops. Foster collaborative design refinement in a shared virtual space

**Course outcomes (COs):**

The student will be able to

**CO1 -** Understand the basics of Virtual Reality (VR) and Augmented Reality (AR), their tools, and applications in design
**CO2 -** Create immersive 3D models and design walkthroughs for real-time architectural exploration.
**CO3 -** Apply VR/AR for site planning by overlaying digital models on real-world environments for analysis.
**CO4 -** Develop real-time interaction in immersive environments to provide design feedback and visualize construction processes.
**CO5 -** Use VR/AR for remote collaboration, real-time design iteration, and client engagement in a shared virtual space.

**References:**


1. Dieck, M. C. T., & Jung, T. *Augmented Reality and Virtual Reality: Empowering Human, Place and Business*. Springer International Publishing, 2019.
2. Mortenson, M. E. *Virtual Reality and Augmented Reality in Industry*. Wiley-Blackwell, 2015.
3. Fuchs, P., Moreau, G., & Guitton, P. *Virtual Reality: Concepts and Technologies*. CRC Press, 2011.
4. Santana, F., & Knippel, E. *Architectural Visualization with Unreal Engine*. Packt Publishing, 2020.
5. Bartle, R. *Designing Virtual Worlds*. New Riders, 2003.
6. Linowes, J., & Babilinski, K. *Augmented Reality for Developers: Build Practical Augmented Reality Applications with Unity, ARCore, and Vuforia*. Packt Publishing, 2017.
7. Zlatanova, S., & Ledoux, H. (Eds.). *Urban and Regional Data Management: UDMS 2013*. CRC Press, 2013.
8. Kensek, K. M., & Noble, D. E. (Eds.). *Building Information Modeling: BIM in Current and Future Practice*. Wiley, 2014.
9. Wang, X., & Schnabel, M. A. (Eds.). *Collaborative Design in Virtual Environments*. Springer, 2008.
10. Dieck, M. C. T., & Jung, T. (Eds.). *Augmented Reality and Virtual Reality: The Power of AR and VR for Business*. Springer International Publishing, 2018.
11. Hale, K. S., & Stanney, K. M. (Eds.). *Handbook of Virtual Environments: Design, Implementation, and Applications*. CRC Press, 2015.

| ELECTIVE-III<br>(AA E09- Advanced Theory of Design: Architecture and Human Settlements, Theory of Urbanism, Landscape Urbanism) | |
|---|---|
| **Course Code:** AA 304 | **Credits:** 3:0:0 |
| **Prerequisite: Nil** | **Contact Hours:** 3 |
| **Course Coordinator:** | |

**Course objectives:**

This course aims to provide an in-depth understanding of the relationship between architectural design, human settlements, urbanism and the integration of landscape within urban frameworks.

**Course Contents:**

**UNIT I**

Evolution of human settlements: From ancient to modern times. Theories of settlement patterns: Natural, cultural, and economic influences. Typologies of human settlements: Rural, urban, and transitional. Architecture's role in shaping human settlements: Sociocultural, economic, and political contexts, Sustainable settlements and eco-friendly design principles.

**UNIT II**

Urbanism as a theoretical framework: Definitions and evolution. City form and structure: Morphological and functional aspects. Urban dynamics: Migration, growth, and spatial transformations. Social equity in urban design: Gentrification, inclusivity, and accessibility. Critiques of contemporary urbanism: Globalization and its challenges.

**UNIT III**

Urban ecology, green infrastructure sustainability to design resilient and functional urban spaces. Key elements include public space design, urban resilience and the incorporation of natural systems into urban environments for enhanced environmental performance.

**UNIT IV**

Modernist and postmodernist perspectives on urban form. Theories of space and place: Public, private, and transitional spaces. Iconicity in architecture and its impact on urban identity, Context-sensitive design: Regionalism, vernacular architecture, and global influences. Smart cities and urban technology: Balancing tradition and innovation.

**UNIT V**

Comparative analysis of international urban theories and practices. Case studies of successful and failed urban and architectural interventions. Research methodologies for urban and architectural theory. Interdisciplinary approaches: Architecture, sociology, ecology, and economics. Future trajectories in urban and landscape theory.

**Course outcomes (COs):**

The student will be able to

**CO1-** Analyze the evolution and typologies of human settlements, understanding architecture's role in influencing sociocultural and environmental dynamics.

**CO2-** Evaluate various theories of urbanism and their relevance to contemporary urban design challenges.

**CO3-** Design resilient and functional urban spaces with the integration of sustainable green infrastructure.

**CO4-** Synthesize theoretical perspectives on architecture and urban form to propose innovative urban and architectural solutions.

**CO5-** Conduct advanced research and critically analyze case studies to develop original theoretical insights and design proposals.

**References:**


1. Conzen, M. P. The Study of Urban Form: Essays in Urban Morphology. Peter Lang, 2004.
2. Lynch, K. The Image of the City. MIT Press, 1960.
3. Kostof, S. The City Shaped: Urban Patterns and Meanings Through History. Thames & Hudson, 1999.
4. Farr, D. Sustainable Urbanism: Urban Design with Nature. Wiley, 2008.
5. Hall, P. Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century. Wiley-Blackwell, 2014


**Evaluation Pattern: Marks allocation for SEE (Term Work)**

| Subject Code | Subject | Portfolio | Report | Total |
|---|---|---|---|---|
| AA 304 | ELECTIVE-III | 40 | 10 | 50 |

**SEMESTER IV**

| PROFESSIONAL TRAINING | |
|---|---|
| **Course Code: AA 401** | **Credits: 0:0:18** |
| **Prerequisite: Nil** | **Contact Hours: Internship** |
| **Course Coordinator:** | |

**Course Objectives:**

To provide exposure to the various dimensions of the Advanced architects profession. The students are required to Study minimum two live Projects designed by Advanced architects, Critical Analysis of the live projects designed by Advance architects.

**Course Contents**

- Study and critical analysis of completed live projects designed by the Advanced architect. Gaining hands-on experience in a real-world architectural setting.
- Understanding the day-to-day operations of an architectural firm.
- Learning about project management, client relations, and team collaboration
- Working with other disciplines (e.g., engineering, landscape architecture, urban planning) to address complex design challenges.
- Through site visits gain practical knowledge, Exposure to Client-Architect relationship.

**Course Outcomes (COs):**

CO1: Understanding of the various types of projects and the process of designing. (PSO1)
CO2: Learn skill of producing detailed drawings for construction on site. (PSO1)
CO3: Understanding of Designing and Detailing out of projects. (PSO1)
CO4: Exposure to Professional practice as per the demand of industry. (PSO3)
CO5: Demonstrate skills to start an independent practice. (PSO3)

**Performance will be evaluated through Viva voce**

The Viva voice marks will be awarded based on the following works:

- Documentation of the work done in the office
- Critical analysis report of two live projects
- Material portfolio

**Note: Students should work under an Architect who is a registered architect from the Council of Architecture. The Certificate should be signed and the registration number must be mentioned.**

**Evaluation Pattern: Marks allocation for SEE (**Viva Voce**)**

| Subject Code | Subject Name | Portfolio | Viva Voce | Total |
|---|---|---|---|---|
| AA 401 | Practical Training (SEE Viva Voce) | 80 | 20 | 100 |

| ELECTIVE –IV (Legal Aspects & Environmental legislation) | |
|---|---|
| **Course Code: AA E07** | **Credits: 3:0:0** |
| **Prerequisite: Nil** | **Contact Hours: 3 Hrs./ Wk** |
| **Course Coordinator:** | |

**Course Objectives**

- Understand the Fundamentals of Environmental Management
- Master Environmental Impact Assessment
- Develop Skills in Environmental Planning and Management
- Appreciate the Role of Landscape Architecture in EIA
- Cultivate a Critical Perspective on Environmental Issues

**Course Contents**

**Unit I**

Significance and Concept of Constitution and Laws in Indian Scenario Indian Constitution: Concept of Law in Indian Scenario, legislation, Meaning and terms of law, ordinance, bill, act, regulation, and bye-laws, importance and significance of laws in relationship to landscape architect, Process of law making.

**Unit II**

Environmental Legislation in India Significance, Powers and function, application, penalties and current scenario of: Environmental Protection Act, Air Act, Water Act, Mining Act, Forest Act, Wetland Act, Biodiversity Act, National Green Tribunal Act, Tribal Act, Wildlife Protection Act, Ancient Monument Act, International Environmental regulation and treaties.

**Unit III**

Land Acquisition Significance, Process of acquisition, ownership details, issues, penalties of land Acquisition 1894, The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

**Unit IV**

Panchayat and Municipalities Need of 73rd and 74th amendments, Balwant Rai Metha Committee and Ashok Metha Committee, Evolution of 73rd and 74th amendment, Distribution of Power – 3 tier governance system, importance of the amendment, implementation of the amendment in different region, issues of the amendment.

**Unit V**

Town Planning Legislation in India and Abroad Town and Country Planning Act, Importance and Need of Development Plans in India, Hierarchy and significance of green area in development plans, Concept of Planning in other countries.

**Course Outcomes (COs):**

**CO1**- Understand the EIA Principles and Process (PO1, PO2) (PSO1)
**CO2**- Identifying and assessing environmental impacts (PO1) (PSO1)
**CO3**- Developing mitigation measures PO1) (PSO1)
**CO4**- Evaluating project options and their environmental implications (PO3) (PSO1)
**CO5**- Decision -making and Policy formulation (PO1, PO2) (PSO3)

**References:**

- Title of the book: Our National park policy,Author Name: Ise John,Publisher's Name: The John Hopkins Press,Publication year: 1961.
- Title of the book: Parks and Recreational Needs in Urban area,Author Name: Commissioner ,Envor C. Cymoodhhammes, Publisher's Name: Twayne Publishers Inc, Publication year: 1969.
- Title of the book: Professional Practice of Landscape Architecture, Author Name: Walter Rogers.
- Title of the book: Project Management for the Design Professional, Author Name: Frank Burstein).

| **ELECTIVE-IV (Parametric urban mapping)** | |
|---|---|
| **Course Code: AA E011** | **Credits: 3:0:0** |
| **Prerequisite: Nil** | **Contact Hours: 3 Hrs./ Wk** |
| **Course Coordinator:** | |

**Course Objectives**

- Examining the historical development of cities, from the emergence of the metropolis to the contemporary city.
- Understanding fundamental urban design concepts like form, movement, infrastructure, network, pattern, and landscape.
- Analyzing different strategies and manipulations employed in urban design to achieve specific goals
- Exploring the theoretical and practical applications of parametric tools in urban design, and their impact on the design process and urban form.

**Course Contents**

**Unit I**

The subject will examine architectural vision of the city from emergence of the metropolis to the contemporary city.

**Unit II**

Emphasizing the concepts of form, movement, infrastructure, network, pattern and landscape, the seminar will investigate different agendas, strategies, manipulations that were employed in relation to the city, forcing a new understanding of the urban realm to emerge.

**Unit III**

This course focuses on the relationship between urban design ideals, urban design action, and the built environment through readings, discussions, presentations, and papers. It specifically will delve into the theoretical development of use of parametric tools in urban design where their utilization augments the multi-layered and collaborative urban design process. It will analyse the diverse design ideals that influence cities and settlements, and investigate how urban designers use parametric technologies to shape urban form.

**Course Outcomes (COs):**

**CO1**- Understand the basic skills in collecting, cleaning, and organizing diverse urban data, including geographic, demographic, and environmental data (PO1, PO2) (PSO1)

**CO2**- analyze spatial patterns and relationships within urban environments using statistical and GIS techniques (PO1) (PSO1)

**CO3**- Understand to use data visualization tools to communicate complex urban information effectively (PO1) (PSO1)
**CO4**- Learn simulation models to predict the impact of urban interventions (PO3) (PSO1)
**CO5**- Apply parametric design techniques to generate innovative and context-sensitive urban solutions (PO1, PO2) (PSO3)

**References:**


1. Parametric Design for Architecture **- Greg Lynn**
2. The Algorithmic City **- Manuel De Solá-Morales.**


| **ELECTIVE –IV (Project Resource Management)** | |
|---|---|
| **Course Code: AA E019** | **Credits: 3:0:0** |
| **Prerequisite: Nil** | **Contact Hours: 3 Hrs./ Wk** |
| **Course Coordinator:** | |

**Course Objectives**

- Understanding the classification, operational characteristics, selection, and procurement of various construction equipment.
- Knowledge of material classification, procurement, planning, and accounting.
- Understanding the principles of HR management, including recruitment, selection, training, compensation, and labor relations.
- Awareness of labor laws and regulations affecting the construction industry.

**Course Contents**

**Unit I**

Classification and operational characteristics of equipment for earthmoving, hauling, hoisting, conveying, pneumatic, pumping, aggregate production, concrete production, pile driving, tunneling and road construction applications.

**Unit II**

Planning, selection and purchase of equipment, for earthmoving, hauling, hoisting, conveying, pneumatic, pumping, aggregate production, concrete production, pile driving, tunneling and road construction applications. New trends and construction equipment of the future.

**Unit III**

Systems of material classification and types of construction materials. Procurement of Materials, Materials & their peculiarities, material planning, accounting and material reconciliation. Basic of personnel management, manpower planning, labor laws and industrial relations. The role of personnel management in construction enterprises.

**Unit IV**

Concepts, definitions, growth, role and functions, new developments in HRD and HRM, manpower estimation for company and project, methods and procedures of estimation at various stages. Methods of recruitment, selection, training, placement, financial compensation, discipline, separation etc. in employing and retaining engineers and managers.

**Unit IV**

Role, functions, status and relationship with other departments, personnel office records and procedures. Labour legislation, related labour acts, grievance handling, enquiry procedure, Labour administration and judiciary in regard to construction industry

**Course Outcomes (COs):**

**CO1**- Understand the basics of Resource Identification and Planning (PO1, PO2) (PSO1)

**CO2**- Analyze the role of Resource Estimation and Budgeting (PO1) (PSO1)

**CO3**- Understand the impact of resource constraints on project timelines (PO1) (PSO1)

**CO4**- Learn using project management software (e.g., MS Project, Primavera) to manage resources effectively. (PO3) (PSO1)

**CO5**- Understand the importance of risk management and contingency planning for resource allocation (PO1, PO2) (PSO3)

**References:**


- The book titled "Construction planning, equipment, and methods (No. 4th ed.)" is authored by Peurifoy, R.L. and Ledbetter, WB and was published in 1985.

- The book titled "Construction Equipment and its planning and Application" is authored by Varma, M, published by Metropolitan Book Co in 1975.
- The book titled "Construction Equipment and" is authored by S. C. Sharma (no publisher or publication year provided).
- The book titled "Human resource management: theory and practice. Palgrave." is authored by Bratton, J. and Gold, published by Palgrave in 2017.
- The book titled "Human Resource Development: Theory & Practice" is authored by Deb, T, published by Ane Books India in 2006.
- The book titled "Human resource management in construction projects" is authored by Dainty, A. and Loosemore, M. eds, published by Routledge in 2013.