



**D. Y. Patil College of
Engineering and Technology**
Kasaba Bawada, Kolhapur

**Fifth Year B. Arch. Structure and
Syllabus
(Autonomous)**

(School of Architecture)

2024-2025

Curriculum w.e.f. 2024-25



SCHOOL OF ARCHITECTURE
D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY,
KASABA BAWADA, KOLHAPUR-416006

An Autonomous Institute

Fifth Year B. Arch.

Curriculum w.e.f. 2024-25

STRUCTURE FOR B. ARCH SEM. – IX

Sr. No	Course Code	Course Type	Name of the Course	Teaching Scheme Per Week			Credits	Total Marks	Evaluation scheme			
				Lecture Hours	Tutorial Hours	Practical/ Studio Hours			Type	Max. Marks	Min. Marks for Passing	
											Individual Course	Aggregate
1	201AR 501	PC	Advanced Architectural Design- II	1	-	06	7	200	ISE	100	50	100
									MSE	-	-	
									ESE (OE)	100	45	
									ESE (TH)	-	-	
2	201AR 502	PC	Architectural Dissertation - I	2	-	6	8	200	ISE	100	50	100
									MSE	-	-	
									ESE (OE)	100	45	
									ESE (TH)	-	-	
3	201AR 503	SEC	Building Information Modeling - I	1	-	3	4	100	ISE	100	50	50
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
4	201AR 504	PE	Professional Elective – VI	1	-	2	3	100	ISE	50	25	50
	201AR 504-A		Architectural Conservation						MSE	-	-	
	201AR 504-B		Sustainable Architecture						ESE (OE)	50	23	
									ESE (TH)	-	-	
5	201AR 505	PAECC	Research Methodology	3	-	-	3	100	ISE	20	25	50
									MSE	30		
									ESE (OE)	-	-	
									ESE (TH)	50	23	
6	201AR5 06	PE	Professional Elective – VII	2	-	1	3	100	ISE	20	25	50
	201AR 506-A		Affordable Housing						MSE	30		
	201AR 506-B		Real Estate Development						ESE (OE)	-	-	
									ESE (TH)	50	23	
Total				10		18	28	800		800		400



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STRUCTURE FOR B. ARCH SEM. - X

Sr. No	Course Code	Course Type	Name of the Course	Teaching Scheme Per Week			Credits	Total Marks	Evaluation scheme			
				Lecture Hours	Tutorial Hours	Practical/ Studio Hours			Type	Max. Marks	Min. Marks for Passing	
											Individual Course	Aggregate
1	201AR 507	PC	Architectural Dissertation- II	2	-	8	10	200	ISE	100	50	100
									MSE	-	-	
									ESE (OE)	100	45	
									ESE (TH)	-	-	
2	201AR 508	PE	Professional Elective – VIII	2	-	2	4	100	ISE	20	25	50
	201AR 508 A		Traffic and Transportation Planning						ESE (OE)	-		
	201AR 508 B		Earthquake Resistant Architecture						ESE (TH)	50	23	
3	201AR 509	BS & AE	Valuation of Immovable Properties	3	-		3	100	ISE	50	25	50
									MSE	-	-	
									ESE (OE)	50	23	
									ESE (TH)	-	-	
4	201AR 510	SEC	Building Information Modeling - II	1	-	3	4	100	ISE	50	25	50
									MSE	-	-	
									ESE (OE)	50	23	
									ESE (TH)	-	-	
5	201AR 511	PE	Professional Elective – IX	2	-	2	4	100	ISE	50	25	50
	201AR 511-A		GIS and Remote sensing						ESE (OE)	50	23	
	201AR 511-B		Emerging Trends in Architecture						ESE (TH)	-	-	
Total				10	-	15	25	600		600		300

ISE - In Semester Evaluation MSE - Mid Semester Examination ESE - End Semester Examination OE - Oral Examination TH – Theory.

NOTE: - As per CoA Gazette 2020 norms, minimum passing percentage for each individual course to be minimum 45%.

Total weeks – 15 weeks



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ABBREVIATIONS	
PC	Professional Core
BS & AE	Building Sciences and Applied Engineering
PE	Professional Elective
OEL	Open Elective
PAECC	Professional Ability Enhancement Core Courses
SEC	Skill Enhancement Courses

PROFESSIONAL ELECTIVE- VI			
Sr. No.	Course Code	Name of Course	SEMESTR
1	201AR 504-A	Architectural Conservation	IX
2	201AR 504-B	Sustainable Architecture	

PROFESSIONAL ELECTIVE VII			
Sr.No.	Course Code	Name of Course	SEMESTER
1	201AR 506-A	Affordable Housing	IX
2	201AR 506-B	Real estate Development	

PROFESSIONAL ELECTIVE VIII			
Sr.No.	Course Code	Name of Course	SEMESTER
1	201AR508 A	Traffic and Transportation Planning	X
2	201AR508 B	Earthquake Resistant Architecture	

PROFESSIONAL ELECTIVE IX			
Sr. No.	Course Code	Name of Course	SEMESTER
1	201AR511-A	GIS and Remote sensing for Architecture	X
2	201AR 506-B	Emerging Trends in Architecture	

Prof. I.S. Jadhav
Head, School of Architecture
D.Y.P.C.E.T.

Head

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Course Plan

Course Title: Advanced Architecture Design-II	
Course Code: 201AR501	Semester: IX
Teaching Scheme: L-T-P: 1-0-6	Credits: 7
Evaluation Scheme: ISE: 100	ESE (OE): 100

Course Description:

This course deals with planning of architectural projects having high complexity in urban or rural context. It covers planning and designing of educational, mercantile, housing, sports, institutional and transportation project. It covers planning, interior layout, services, landscape, site development, structural aspects & construction materials of respective architectural project. It involves in depth study of principles of sustainability.

Course Objectives:

1	To design architectural projects having high complexity.
2	To inculcate principles of sustainable, green buildings, eco-friendly architecture.
3	To apply building bye-laws & norms.
4	To apply various advanced services in design of high complexity architectural project.

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C501.1	Understand design program and site characteristics.
C501.2	Analyze case studies and draw conclusions.
C501.3	Analyze the relevant data.
C501.4	Design with principles of sustainability.
C501.5	Apply knowledge of building services.
C501.6	Prepare & present architectural design using related software skills.



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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		BTL
													1	2	
C501.1	1			2		3	2					1		3	2
C501.2	2	2	1		2			1	2			1			3
C501.3	3	2	1		2					1					3
C501.4		2	2		2		1					2	3		5
C501.5		1	2		2							1	2		6
C501.6			1		2				1	2	1	2	1	3	4

Unit No.	Course Content	Hrs.
1	Unit 01: Assignment study	14
	1.1 Study of design program.	
	1.2 Analysis of a given site.	
	1.3 Study model of site with existing features.	
2	Unit 02: Case-study	14
	2.1 Case-studies of similar projects, comparative analysis and conclusion.	
	2.2 Case-study presentation.	
3	Unit 03: Data collection	7
	3.1 Data collection and analysis	
	3.2 Relevant building Bye laws & norms.	
4	Unit 04: Concept and Design development	35
	4.1 Development of design through concept, zoning and circulation with consideration of structural aspect, climate, services, parking.	
	4.2 Application of sustainable design strategies.	
5	Unit 05: Design of Services	21
	5.1 Collection of data of all relevant services with a report.	
	5.2 Preparation of layouts of various relevant building services including drainage, plumbing, HVAC, WIFI, firefighting, electrical and other relevant services.	
6	Unit 06: Design Presentation	14
	6.1 Presentation of final design using various software (2D drawings, 3D models/walkthrough)	



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Sessional work:

Architectural design – 60% weightage

- It will include architectural design proposal with respect to site analysis and design program. It should include site development, parking layouts, designs of built spaces, outdoor activities, interior layouts, landscape design, ancillary facilities, advanced technologies and appropriate material pallet.
- Portfolio should include all relevant drawings & 3D views.

Services – 40% weightage

- Services portfolio will include layouts of plumbing, sanitation, HVAC, sewage disposal & electrification, firefighting etc. as applicable including vertical transportation.

Reference material:

1	Ernst Neufert, Neufert Architects' Data, Wiley, 28 August 2023
2	Ching, Francis D. K., Architecture: Form, Space, and Order, John Wiley & Sons Inc, 24/04/2023
3	National Building Code of India 2016 (NBC 2016), Bureau of Indian Standards
4	Simonds John, Landscape Architecture: A Manual of Site Planning and Design, McGraw-Hill Education; 3rd edition (16 November 1997)



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Course Plan

Course Title: Architectural Dissertation - I	
Course Code :201AR502	Semester: IX
Teaching Scheme: L-T-P: 2-0-6	Credits: 08
Evaluation Scheme: ISE: 100	ESE (OE): 100

Course Description:

This course intends to develop the capacity of students to handle complex architectural projects independently. It provides a pathway of background research required to be carried out for designing complex architectural projects by studying literature, conducting case studies, surveys and interviews, identifying socio-economic, cultural, and architectural issues, and arriving at a conclusion by analysis and synthesis of data collected to provide a base for the formulation of architectural project. It will help students to develop a topic of architectural significance, for proficiency in a range of research methodologies and critical appraisal skills through individual research. The course underlines the process of solving these issues through an architectural project.

Course Objectives:

1	To prepare students to independently handle architectural design problems with different research areas
2	To understand the evolutionary stages of design, process, importance, etc. Through rigorous literature review.
3	To study and analyze the data collected.
4	To understand various perspectives in varied case studies to be studied
5	To introduce contents and method of writing synopsis
6	To understand the holistic approach and present in seminar

Course Outcomes (COs):

COs	At the end of successful completion of the course, the students will be able to...
C502.1	Analyze secondary data
C502.2	Formulate synopsis.
C502.3	Analyze primary data.
C502.4	Analyze case studies
C502.5	Formulate architectural project.
C502.6	Present the findings of study through a seminar.

Prerequisite: Reading of research papers, articles, reports etc.



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													1	2	
C502.1		1		1		1		1		1		2	1		4
C502.2										2					3
C502.3				1						1		2	1		4
C502.4	2	2				1	3	2	0	1		2			4
C502.5			1	2									1		3
C502.6				1						2				3	3

Unit No.	Course Content	Hrs.
1	Unit 01 Literature review	32
	1.1 Literature review in the area of interest	
	1.2 Secondary data collection by referring research papers, articles, newspapers, books, codes, standards and norms, etc. as per the need and relevance of the topic.	
	1.3 Analysis of secondary data to draw inferences.	
2	Unit 02 Synopsis	16
	2.1 Dissertation topic selection and finalization	
	2.2 Writing detailed synopsis on a topic selected in its own words explaining introduction, need, aim, objectives, scope, limitations, and methodology of the project.	
3	Unit 03 Seminar	16
	3.1 The Outcome of logical research on the topic selected.	
4	Unit 04 Data Collection	16
	3.1 Primary data collection by using various methods like surveys, interviews, measure drawings, etc. as per the need of the topic. Analysis of primary data as well as secondary data to conclude.	
5	Unit 05 Case study analysis	24
	4.1 Minimum one live and two net/bookcase studies relevant to the topic selected.	
	4.2 Comparative analysis of the case studies to draw conclusions	
6	Unit 06 Project Formulation	16
	5.1 Project formulation based on conclusions drawn from secondary & primary data collection and case studies, bearing minimum built up area of 8000 sq.m.	



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Sessional work:

1. At the end of the semester students will submit a report in A4 size portrait format with spiral binding, duly signed by the student, guide, and Head, School of Architecture.
2. Portfolio containing graphical representation of literature review, synopsis, methodology, case studies, comparative analysis, conclusions and project formulation.

Reference material:

1	Navneet Mounoth, Mahafuzuar Rahman Barbhuiya, Thesis manual for Bachelor of Architecture – A handbook of requirements and suggestions, First Edition, 2020.
2	Indranil Sen, 11 Steps to Architectural Thesis, Notion Press, 2018.



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Course Plan

Course Title: Building Information Modeling-I	
Course Code: 201AR503	Semester: IX
Teaching Scheme: L-T-P: 1-0-3	Credits: 4
Evaluation Scheme: ISE: 100	ESE (OE): Nil

Course Description:

This course is a comprehensive exploration of Autodesk Revit Structure, covering key aspects essential for structural design proficiency. This will begin with an introduction to Revit Structure, followed by in-depth modules on levels and template creation. Students will gain expertise in structural reinforcement techniques and learn to create detailed views and construction-ready documentation. The course concludes with a practical emphasis on Construction Documents and Scheduling, providing participants with a well-rounded skill set for effective structural design using Revit.

Course Objectives:

1	To understand the fundamental principles of creating a new project and set up project properties
2	To learn the creation and manipulation of levels in Revit Structure
3	To understand the concept of structural framing and its application in Revit.
4	To explore the tools for modeling structural walls and understand their properties
5	To understand the process of adding reinforcement to structural elements
6	To learn how to use Revit for accurate and detailed construction documentation

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C503.1	Create and manage new projects with proper project properties.
C503.2	Demonstrate proficiency in working with levels, ensuring accurate representation of the structural hierarchy
C503.3	Apply structural framing concepts to model complex structures accurately
C503.4	Demonstrate competence in steel modeling, including the creation and modification of steel columns, beams and slabs.
C503.5	Apply reinforcement to structural elements, can place and modify rebar in columns, beams, and slabs.
C503.6	Create and customize schedules for quantities and information, ensuring clarity and consistency in construction documentation

Prerequisite: Revit, Revit Architecture



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													1	2		
C503.1					3						1				3	6
C503.2					3										3	3
C503.3					3										3	3
C503.4					3										3	4
C503.5					3										3	4
C503.6					3										3	6

Unit No.	Course Content	Hrs.
1	Unit 01 Introduction to Revit Structure	8
	1.1 About Structural Elements, Structural Templates, Starting a new project	
	1.2 GUI, Placing structural objects as per guidelines, Drawing aids, Project units Linking CAD files, Linking and importing Revit files	
2	Unit 02 Levels and Template Creation	8
	2.1 Structural objects - adding up levels, Creating levels, Modifying levels	
	2.2 Creating view templates, Applying and assigning view templates, Understanding visibility and graphics overrides.	
3	Unit 03 Structural Elements and Structural Framing	16
	3.1 Modeling structural columns, Modifying structural columns, Placing structural columns as per drawing, Placing structural beams, Modifying structural beams, Beam – column joints	
	3.2 Modeling structural beam system, Modifying structural beam system	
4	Unit 04 Structural walls, floors and Steel Modeling Structural slabs & openings	12
	4.1 Creating structural walls, Modifying structural walls, Creating structural floors, Modifying structural floors	
	4.2 Placing steel columns and beams, Placing bracing system, Modifying bracing system, placing structural trusses, Modifying structural trusses	
	4.3 About structural slabs, modeling structural slabs, modeling structural slabs, creating openings on structural elements.	



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5		Unit 05 Structural reinforcement, Creating views and Details	8
	5.1	About structural reinforcement, Adding rebars on structural elements, Modifying rebars, Reinforcing walls, floors and slabs	
	5.2	Duplicating views, Adding callout views, Elevations and sections	
	5.3	Setting up detail views, Adding detail components, Annotating details	
6		Unit 06 Construction Documents and Scheduling	8
	6.1	Working with dimensions, Working with text adding tags, Adding detail lines and symbols, Creating legends, Setting up sheets, Placing and modifying view on sheets	
	6.2	Structural schedules Graphic column schedules, Working with schedules,	
	6.3	CAD formats, Exporting to IFC, Exporting to DWF/Dxf, Printing sheets	

Sessional work:

Project on previous year's design.

Reference material:

1	BIM Handbook A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors Chuck Eastman Paul Teicholz Rafael Sacks Kathleen Liston
2	Building Information Modeling: Planning and Managing Construction Projects with 4D CAD and Simulations (McGraw-Hill Construction Series), 1st Edition McGraw Hill
3	Building information modeling using Revit for Architects and Engineers.

Video Links:

1	https://www.udemy.com/course/revit-structure-beginners-to-advanced-contractor-services/?couponCode=24T4FS22124
2	https://www.udemy.com/course/revit-structure-beginners-to-advanced-contractor-services/?couponCode=24T4FS22124
3	https://www.udemy.com/course/revit-mep-beginners-to-advanced/?couponCode=24T4FS22124



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Course Plan

Course Title: Architectural Conservation	
Course Code: 201AR504-A	Semester: IX
Teaching Scheme: L-T-P: 1 – 0 - 2	Credits: 3
Evaluation Scheme: ISE: 50	ESE (OE): 50

Course Description:

The course will concentrate on fostering fundamental abilities and knowledge related to conservation procedures. Its objective is to enhance students' ability to interact with the intricacies of preserving built heritage. This includes the documentation of built heritage, comprehension of traditional building materials, and assessment.

Course Objectives:

1	To study key principles of architectural conservation.
2	To explain the importance of preserving built heritage in the context of architectural history
3	To study the characteristics of traditional building materials and construction methods.
4	To gain skills of documentation methods for recording and representing historic structures and sites.
5	To study the different conservation strategies in preserving architectural integrity.

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C504.1	Identify key principles of architectural conservation.
C504.2	Interpret the importance of preserving built heritage in the context of architectural history
C504.3	Identify the characteristics of traditional building materials and construction methods.
C504.4	Apply documentation methods for recording and representing historic structures and sites.
C504.5	Analyze the effectiveness of different conservation strategies in preserving architectural integrity.
C504.6	Implement processes of documentation in the case study

Prerequisite:- Knowledge of history in architecture including architectural styles, construction technology and material.



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													1	2	
C504.1						2						1			3
C504.2				1		1	2	1					1		3
C504.3				1			2								3
C504.4				1								1			4
C504.5		1		1	3	1		2			1		1	3	4
C504.6		1			2			1		3		1		3	5

Unit No.	Course Content	Hrs.
1	Unit 01: Introduction to Conservation	6
	1.1 Introduction to Cultural Heritage	
	1.2 Importance of Heritage Conservation	
	1.3 Key Principles & Terminology of Conservation	
	1.4 Role of Governing Bodies in Conservation, grading criteria	
2	Unit 02: Understanding Traditional Building Material	9
	2.1 Introduction to the traditional Building Material	
	2.2 Condition assessment of materials like lime, stone, timber, etc.	
3	Unit 03: Introduction to Conservation Strategies	6
	3.1 Methodology in Conservation	
	3.2 Strategies in Conservation	
4	Unit 04: Methods & Processes for Documentation	9
	4.1 Introduction to tools, techniques and methods	
	4.2 Graphical Representation of historic sites & Structures	
5	Unit 05: Condition Mapping	9
	5.1 Processes for Condition Mapping	
	5.2 Site visit to understand condition mapping	
6	Unit 06: Analysis and Interpretation	6
	6.1 Hands on documentation limited up to condition mapping	



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Notes:

The knowledge gained throughout the above six units will be implemented by selecting a **small scale built form limited to but not exceeding 100 sq. m.** at the beginning of the semester. Timely site visits and workshops will be conducted.

Cultural heritage includes artefacts, monuments, a group of buildings and sites, museums that have a diversity of values including symbolic, historic, artistic, aesthetic, ethnological or anthropological, scientific and social significance. It includes tangible heritage (movable, immobile and underwater), intangible cultural heritage (ICH) embedded into cultural, and natural heritage artefacts, sites or monuments. The definition excludes ICH related to other cultural domains such as festivals, celebration etc. It covers industrial heritage and cave paintings.

source- UNESCO Institute for Statistics, 2009 UNESCO Framework for Cultural Statistics.

Sessional work:

- Assignments (file-based, sheets)
- Case study report.

Reference material:

1	Feilden, Bernard M.: Conservation of historic buildings, Architectural Press 2005
2	English Heritage, Practical Building Conservation Series
3	INTACH, Conservation Briefs
4	Historic England (English Heritage): Understanding Historic Buildings: A Guide to Good Recording Practice, 2006
5	Handbook of Conservation of Heritage buildings, CPWD, New Delhi



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Course Plan

Course Title: Sustainable Architecture	
Course Code: 201AR504-B	Semester: X
Teaching Scheme: L-T-P: 1-0-2	Credits: 3
Evaluation Scheme: ISE: 50	ESE (OE): 50

Course Description:

This course aims to provide students with a comprehensive understanding of Sustainable Architecture and strategies for sustainable design. The course explores the fundamental concepts, technical standards, and certification systems related to green building. Additionally, it also elaborates knowledge about the environmental, social, and economic aspects of sustainable living.

Course Objectives:

1	To understand the Global environmental scenario, Global warming, climate change, environmental impacts due to construction industry.
2	To develop awareness about sustainable architecture, its need and scope.
3	To study sustainable building materials.
4	To disseminate the sustainable development goals.
5	To understand the green building certification systems.
6	To study the application of strategies for sustainable design

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C504.1	Understand importance of sustainable architecture in view of global environment scenario.
C504.2	Explain strategies used for sustainable buildings in India and Abroad.
C504.3	Identify sustainable building materials.
C504.4	Discuss sustainable development goals.
C504.5	Differentiate between sustainable and green building.
C504.6	Apply green building certification criteria.

Prerequisite: Basic Knowledge of Sustainability, Energy conservation, Water Conservation etc.



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													1	2		
C504.1	1			1		2										2
C504.2	1	1		1								1		3		2
C504.3	1	1					1									2
C504.4							1									2
C504.5																2
C504.6				1		2								3		3

Unit No.	Course Content	Hrs.
1	Unit 01 Sustainable Architecture and global environmental scenario	6
	1.1 Definition of sustainable architecture, need, scope	
	1.2 Sustainable Architecture and Pillars of sustainability	
	1.3 Global environmental scenario, efforts to reduce carbon emissions.	
2	Unit 02 Sustainable Buildings in India and Abroad	6
	2.1 Sustainable building from India or Abroad – Case Study	
	2.2 Strategies for sustainable design	
3	Unit 03 Sustainable Building Materials	12
	3.1 Various sustainable building materials	
	3.2 Life cycle analysis and tools	
4	Unit 04. Sustainable Development Goals	6
	4.1 Need and importance of SDG's	
	4.2 SDG's and sustainable architecture	
5	Unit 05. Difference between sustainable and green building	6
	5.1 Difference between Sustainable building and Green building	
	5.2 Parameters of Sustainable Building	
	5.3 Parameters of Green Building	



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6		Unit 06. Green Building Certification Systems	9
	6.1	Evolution of Green building rating systems – its relevance and need	
	6.2	Types of certification systems worldwide	
	6.3	Application of GRIHA and IGBC for any architectural project	

Sessional work:

1. Sheets for understanding of Sustainable Architecture and strategies for sustainable design.
2. Application of Rating Systems to Building Design: Students will engage in a project based exercise where they will apply recognized rating systems (e.g., GRIHA, IGBC) to the design of a building. They will incorporate sustainable design strategies and elements to achieve a higher rating. This practical work will enhance their skills in implementing strategies for sustainable design.

Reference material:

1	Sustainable buildings in practice: What The users Think by Baird, T & F India
2	Strategies for Sustainable Architecture by Paola Sassi, T & F India
3	Sustainable Design: Ecology, Architecture and Planning by Daniel E, Williams, FAIA
4	IGBC new building rating system manual
5	GRIHA Manual Volume -01, Version 2019



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Course Plan

Course Title: Research Methodology	
Course Code :201AR505	Semester: IX
Teaching Scheme: L-T-P:3-0-0	Credits: 3
Evaluation Scheme: ISE+MSE: (20+30)	ESE (TH): 50

Course Description:

The study of Research Methodology gives an opportunity to the students to know research techniques and methodology of the scientific writings and philosophical research work. This is an essential part of students who are aspirant for research without which research work is not possible. They also become aware about research ethics.

Course Objectives:

1	To define the fundamentals of research.
2	To illustrate to review the literature.
3	To describe the concept of research design.
4	To demonstrate application of methods and tools of data collection.
5	To explain the structure and purpose of the research papers and research reports.
6	To explain the basic concepts of research ethics and publishing.

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C505.1	Describe the fundamentals of research.
C505.2	Prepare literature review for the research study
C505.3	Conduct the research design techniques
C505.4	Apply the methods and tools of data collection in the research study
C505.5	Write the research paper
C505.6	Apply the knowledge of research ethics and publishing in research paper and report writing

Prerequisite: Nil



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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		BTL
													1	2	
C505.1				1								1			2
C505.2				1								1		3	3
C505.3				1								1		3	3
C505.4				1	2							1		3	6
C505.5					1					1		1		3	3
C505.6								3				1			6

Unit No.	Course Content	Hrs.
1	Unit 01- Fundamentals of Research	6
	1.1 What is Research, Objectives of Research, Types of research & its significance in Architecture, Methods of Research, Understanding the language of research Concept, construct, Variable, types of measurable scale.	
2	Unit 02 Literature Review	6
	2.1 Importance of literature review in defining a problem, primary and secondary sources, reviews, monograph, research databases, identifying gap areas from literature and research database	
3	Unit 03 Research Design	9
	3.1 Identification of a problem, research question, concept of hypothesis, sample, sampling techniques or methods, choice of sampling techniques, sample size, data analysis	
4	Unit 04. Methods and Tools of data collection	12
	4.1 Meaning and importance of data, sources of data, use of secondary data, methods of collecting primary data, observation method, experimentation, simulation, interviewing, panel method, mail survey, projective technique. Types of data, construction of schedules and questionnaires	
5	Unit 05 Research paper and Report writing	6
5.1 Types of research papers, writing a research paper, where to publish, impact factor of journals, Reference management software, Software for paper formatting, software for Plagiarism, scholarly publishing- IMRAD concept and design of research paper, citation and acknowledgement, references, bibliography and citations, types of reports, research report format, principles of writing.		



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6	Unit 06 Research ethics and publishing	6
6.1	Ethics, IPR- intellectual property rights and patent law, commercialization, copyright, royalty, trade related aspects of intellectual property rights (TRIPS); plagiarism, reproducibility and accountability	

Sessional work:

1. Assignments on each unit
2. Writing a research paper/ review paper for a selected journal related to Architectural Dissertation.

Reference material:

1	Business Research Methods by Donald R Cooper and Palmela Schinder. McGraw Hill
2	Advanced Research Methodology by R. Barker Bausell. Scarecrow Press
3	Research Methodology: An Introduction by Wayne Goddard, Stuart Melville. Juta and Co. Ltd.
4.	The Essence of Research Methodology by Jonker, Jan, Pennink, Bartjan. Springer.
5.	Research design: Qualitative, quantitative, and mixed methods approaches by Creswell, J. (4th ed.) Thousand Oaks, CA: Sage

Video Links:

1	https://www.youtube.com/watch?v=-kguiI17880
2	https://www.youtube.com/watch?v=io2_Y4tX2F4&list=PL7w57XDoO4xzzBpxcRKO7Cp1hbAbx-1IO



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Course Plan

Course Title: Affordable Housing	
Course Code : 201AR506-A	Semester: IX
Teaching Scheme: L-T-P: 2-0-1	Credits: 03
Evaluation Scheme: ISE+MSE: 20+30	ESE (TH): 50

Course Description:

This course enables students to understand the fundamentals of affordable housing for better living situations along with economical and sustainable living. It makes them understand the need for affordable housing, various affordable housing policies at both central and state levels, and various challenges and issues of affordable housing. It will help create awareness about the importance of housing in the Indian context and to impart knowledge for designing affordable housing projects. The course sensitizes students about various issues of housing affordability, neighborhood planning, design, etc. It also makes students understand the technological advancements and design innovations in affordable housing.

Course Objectives:

1	To understand the concept, and need of affordable housing and understand the evolution of housing across space, time, and different contexts.
2	To Understand the housing Policies & Agencies involved.
3	To study the issues and challenges in the housing sector.
4	To understand various construction methods and materials in the affordability sector.
5	To study live projects as case studies in affordable housing.
6	To study newer technologies and innovations used in affordable housing

Course Outcomes (COs):

COs	At the end of successful completion of the course, the students will be able to...
C506.1	Understand the concept of affordable housing and the transformation of housing till contemporary times.
C506.2	Understand the government policies on affordable housing.
C506.3	Understand the impact of urbanization in the housing sector.
C506.4	Discuss the major issues faced and challenges in the affordable sector.
C506.5	Analyze the different case studies
C506.6	Discuss the recent technology used in affordable housing.

Prerequisite:-NIL



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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)

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													1	2		
													1	2		
C506.1						2										2
C506.2				1		1										2
C506.3				1												2
C506.4						1										2
C506.5				1		2			1	1						3
C506.6						2										2

Unit No.	Course Content		Hrs.
1	Unit 01. Introduction to Affordable Housing		6
	1.1	Definition of affordable housing	
	1.2	Socio-economic factors influencing housing affordability and need for affordable housing	
2	Unit 02. Affordable Housing and Issues and Challenges		9
	2.1	Understanding the issues related to design, services and amenities, social, economic, cultural and environmental aspects of affordable housing.	
	2.2	Urbanization - Concept, Factors, Impact	
	2.3	Understanding the Infrastructural Challenges, Financial Challenges, Challenges in Project Implementation, Connectivity Challenges, etc.	
3	Unit 03. Government Policy and Regulation		9
	3.1	Need for Government Interventions in affordable housing sector	
	3.2	Various Central and State level policies in Urban and Rural areas	
	3.3	Housing schemes and NGO's working in housing sector	
4	Unit 04. Construction and cost optimization		6
	4.1	Construction methods and materials currently used for affordable housing with the help of case studies.	
	4.2	Value engineering techniques to optimize costs without compromising quality. Project management strategies for cost-effective construction.	



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5		Unit 05. Case studies	9
	5.1	Detail study of various affordable housing projects in India and abroad.	
6		Unit 06. Design Innovations and Technology in Affordable Housing	6
	6.1	Impact of technology in the affordable housing sector.	
	6.2	Current concepts such as Global Housing Technology Challenge (GHTC) and Technologies in quality construction of affordable housing.	

Sessional work: Assignment on each unit

Reference material:

1	Introduction to Housing, HERA (Author) Prentice Hall (2005)
2	Davis, Sam. The Architecture of Affordable Housing.
3	National Building Code 2005 2. Housing by Macs ai john. 3. Population and Housing Problems in India by Maurya S.D.
4	Gonzalo Lizarralde, The Invisible Houses: Rethinking and designing low-cost housing in developing countries, Routledge
5	LAL A. K., Handbook of Low-Cost Housing, New Age International Private Limited

Video Links:

1	https://youtu.be/GE0sNuStiOs - Alejandro Aravena's low-cost housing solutions
2	https://youtu.be/SoJR6nFMTxU - Laurie Baker: The Architect of the Poor



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Course Plan

Course Title: Real Estate Development	
Course Code: 201AR 506-B	Semester: IX
Teaching Scheme: L-T-P: 2-0-1	Credits: 3
Evaluation Scheme: ISE +MSE: 20+ 30	ESE (TH): 50

Course Description:

Real Estate Development explores the process, principles, and practices involved in the creation and enhancement of real estate projects. This course delves into the various stages of development, including site selection, feasibility analysis, financing, design, construction, marketing, and management. Students will gain an understanding of the complexities and challenges associated with real estate development, as well as the strategies and tools used to navigate these processes effectively. Emphasis will be placed on sustainable development practices, urban planning considerations, and the integration of social, economic, and environmental factors into the real estate development process

Course Objectives:

1	To describe the concept, and need of real estate development and land related policies in the construction industry.
2	To know the Land and Building related regulations
3	To know the various housing policies and understand the concept of real estate management
4	To identify various types of real-estate properties
5	To study current trends in real estate
6	To identify various types of Public Private Participation

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C506.1	Understand the concept, and need of real estate development and land related policies in the construction industry.
C506.2	Apply the land and building related regulations in their project
C506.3	Remember the various housing policies
C506.4	Understand types of real-estate properties
C506.5	Discuss current trends in real estate
C506.6	Understand various types of Public Private Participation

Prerequisite: Nil.



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													1	2		
C506.1		2				2		1						1		
C506.2						2		1						1		
C506.3		1				2								1		
C506.4		1				2		1								
C506.5		1				2										
C506.6		1				2								1		

Unit No.	Course Content	Hrs.
1	Unit 01 Development of land	9
	1.1 Introduction to Real Estate Development	
	1.2 Type of land and property; Land use planning & Urban Land Management	
	1.3 Land as a resource of Urban Development (supply and demand of land)	
	1.4 Basic components of Urban Land Policy; Land assembly; Land Pooling techniques; Land Holding (Free Hold and Lease Hold).	
2	Unit 02 Land and Building related regulations	9
	2.1 Land and building related regulations; Building Bye-laws, Real Estate laws like RERA; Apartments Act, Land registration and Society Registration Act.	
3	Unit 03 Policies and Guidelines in Real Estate development	6
	3.1 Housing policies and Real Estate development in India	
	3.2 Master Plan guidelines in relation to real estate growth	
	3.3 Real Estate management concepts	
4	Unit 04 Types of real-estate properties	9
	4.1 Various types of real-estate properties such as multi-family, Gated Community and service apartments, student housing, affordable housing, senior housing, mixed use, transport-oriented development, smart growth, brown field development, etc.,	
5	Unit 05. Current trends in real estate	9
	5.1 Current trends in real estate – Introduction to SEZ, SPV, Joint ventures, Franchisee systems, Types & Parameters, Smart city concepts, Environmental impact assessment, land related acts.	
6	Unit 06. Public Private Participation	3
	6.1 Systems drawn and informal participation, various models of public participation, BOT, BOOT, BOO, ROOT, DBOT, DBFO etc.	



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Sessional work: Assignment on each Unit.

Text Books:

1	"Real Estate Management: Principles and Practices" by James R. DeLisle and Dennis J. Gayle
2	"Real Estate Development: Principles and Process" by Mike E. Miles, Laurence M. Netherton, and Adrienne Schmitz

Video links:

1	https://www.udemy.com/course/fundamentals-of-indian-real-estate-by-rohit-gaikwad/?couponCode=24T4FS22124
2	https://www.udemy.com/course/right-to-information-act/?couponCode=24T4FS22124
3	https://maharera.maharashtra.gov.in/agent-training
4	https://onlinecourses.nptel.ac.in/noc20_ar14/preview



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Course Plan

Course Title: Architectural Dissertation - II	
Course Code :201AR507	Semester: X
Teaching Scheme: L-T-P: 2-0-8	Credits: 10
Evaluation Scheme: ISE: 100	ESE (OE): 100

Course Description:

This course intends to apply knowledge of all the courses learned in previous semesters by students to design complex architectural projects. It demonstrates the process of site selection, site analysis, and proposing an architectural project based on the conclusion and findings of the analysis. The course develops the capacity of students to make decisions for proposing contextual and sustainable architectural design proposals of the project.

Course Objectives:

1	To design a complex architectural project.
2	To prepare presentation drawings of a complex architectural project.
3	To prepare a technical report of a complex architectural project.
4	To understand the importance of analyzing and forming a written report of thesis project

Course Outcomes (COs):

COs	At the end of successful completion of the course, the students will be able to...
C507.1	Select the appropriate site for the project.
C507.2	Analyze site at macro and micro level
C507.3	Design a complex architectural project.
C507.4	Prepare a report in the prescribed format.
C507.5	Prepare & present complex design project in an effective manner.

Prerequisite: Knowledge of all courses learnt in previous semesters.



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													1	2	
C507.1	1												1		1
C507.2		1					1						1		3
C507.3	2	2	2		3	3	2	1	1			1	3	3	2
C507.4					2					1					4
C507.5									1	2				3	4

Unit No.	Course Content	Hrs.
1	Unit 01- Site selection	20
	1.1 Selection of site of appropriate area and context, based on the analysis and conclusions of literature review, case studies, and design program.	
	1.2 Site and Neighborhood study, Proximity analysis	
2	Unit 02 Site analysis	20
	2.1 Macro and micro level site analysis. City level, area level and spot level analysis of site selected.	
3	Unit 03 Design proposal	70
	3.1 Design proposal based on project formulation. The built-up area of the proposal should be a minimum of 8000 Sq.m.	
4	Unit 04 –Report	20
	4.1 Report in prescribed format containing a certificate, acknowledgment, abstract, list of tables, list of graphs/charts, list of figures, abbreviations, literature review, synopsis, case studies, comparative analysis of case studies, conclusions, design program, site selection, site analysis, conclusions, design proposal, and references.	
5	Unit 05 – Presentation of Design proposal	10
	5.1 Presentation of complex design problem by using modern tools & software.	

Sessional work:

- At the end of the semester students will submit a Report in hardbound A4 size portrait format duly signed by the student, guide/s, Head, School of Architecture, and Principal of the college.
- Portfolio containing Project introduction, case studies, comparative analysis of case studies and inferences, project formulation, site analysis, site plan, all floor plans, sections, elevations, and 3D



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views. The portfolio may be prepared in colander format or form of a panel. The appropriate scale and size of the portfolio are left to the discretion of the student.

- Physical model or walk through.

Reference material:

1	Navneet Mounoth, Mahafuzuar Rahman Barbhuiya, Thesis manual for Bachelor of Architecture – A handbook of requirements and suggestions, First Edition, 2020.
2	Indranil Sen, 11 Steps to Architectural Thesis, Notion Press, 2018.



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Course Plan

Course Title: Traffic & Transportation Planning	
Course Code: 201AR508A	Semester: X
Teaching Scheme: L-T-P: 2-0-2	Credits: 4
Evaluation Scheme: ISE+MSE:20+30	ESE (TH): 50 Marks

Course Description:

This course will inculcate knowledge of transport planning process, modeling and safety. It will also provide an insight on traffic and its components, factors affecting road traffic and traffic movements. This course will help to identify the role of various modes of Mass Transportation and inter relation of transport and environments

Course Objectives:

1	To Understand the steps in planning process, road hierarchy and survey techniques.
2	To Understand the different types of traffic characteristics.
3	To Study the public transportation and its scope in town planning process.
4	To Study road safety and civic sense.
5	To Analyze traffic issues and its impact on environment.
6	To Study Rural Transportation system.

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C508.1	Understand the different vehicular characteristics
C508.2	Acknowledge the hierarchy of road networking
C508.3	Recognize the road intersections in urban areas.
C508.4	Understand pedestrian infrastructure.
C508.5	Recognize types of traffic signs, principles and road markings.
C508.6	Acknowledge road safety and civic sense.

Pre-requisite: Knowledge of modes of transport and hierarchy of roads.



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													1	2		
C508.1				2		3		1						1		2
C508.2	1															2
C508.3	1															2
C508.4	1					1										2
C508.5						2		1								2
C508.6						1										2

Unit No.	Course Content	Hrs.
1	Unit 01: Introduction to Road Safety and Civic Sense	12
	1.1 Need for Road Safety, Category of Road Users and Road Safety Suggestions Precautions for Driving in Difficult Conditions (Night, Rain, Fog, Skidding Conditions, Non-Functional Traffic Light etc.)	
	1.2 Types of Breakdowns and Mechanical Failures. Accident Sign (Warning Light, Warning Triangle, etc.)	
	1.3 Introduction to Concept of Civic Sense and its relationship to Road Safety: Importance of Civic Sense, Road Etiquettes and Road User Behavior, Rules of Road, Right way of the Way. Providing assistance to Accident victim. Sensitization against Road Rage.	
2	Unit 02: Roads & Vehicles	12
	2.1 Road as an active space, Types of Users, User Behavior, Sensory Factors like Vision and Hearing in User Behavior.	
	2.2 Types of Vehicles: Heavy Vehicles, Light Motor Vehicle, Two Wheelers, Auto-Rickshaw, Bicycles and Cycle Rickshaw, Non-Motorized Vehicles	
	2.3 Vehicle Characteristics: Dimensions, Weight, Turning Radii, Braking Distance, Lighting System, Tyers, etc. Types of Hazards: Conflicts and Accident	
	2.3 Design of Roads: Cross-Sectional Elements- Right of Way, Carriageway, Median, Shoulders, Sidewalk, Lanes, Cycling Track, Green Strip, Curbs, Camber, etc. Spatial Standards for the Cross-Section Design.	
2.4 Relationship between Road Design and Road Safety.		



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3	Unit 03: Typology of Roads: Components and Design		12
	3.1	Road Classification: National Highways, State Highways, District Roads (MDR and ODR), Village Roads	
	3.2	Urban Road Classification: Expressways, Arterial, Sub-Arterial, Collector, Local, Service Roads, One-Way, Two-Way etc. Mountainous Roads. Speed Limits of the Road types.	
	3.3	Design of Roads: Cross-Sectional Elements- Right of Way, Carriageway, Median, Shoulders, Sidewalk, Lanes, Cycling Track, Green Strip, Curbs, Camber, etc. Spatial Standards for the Cross-Section Design.	
	3.4	Relationship between Road Design and Road Safety.	
	3.5	Location and Design for Traffic Signals.	
4	Unit 04: Road Intersections		8
	4.1	Types of Road Intersections: Basic Forms of at-grade Junctions (T, Y, Staggered, Skewed, Cross, Scissors, Rotary, etc. Grade Separated Junctions (with or without interchange): Three-Leg, Four-Leg, Multi-Leg, etc.	
	4.2	Design of Intersections: Design and Spatial Standards for Traffic Islands, Turns, Turning Radi, Directional Lanes, Pedestrian Crossings, Median Openings, Traffic Calming Components like Speed Breakers and Table-Top Crossings etc.	
	4.3	Design Considerations for Diverging, Merging, and Weaving Traffic.	
	4.4	Location and Design for Traffic Signals.	
5	Unit 05: Pedestrian Circulation and Barrier Free Design		8
	5.1	Requirement of Pedestrian Infrastructure: Sidewalks and Footpaths, Recommended Sidewalk Widths, Pedestrian Crossings, Pedestrian Bridges, Subways, Cycle Tracks, etc.	
	5.2	Barrier Free Design: Location and Design Standards for Ramps for Wheel Chair Access, Other Provisions like Tactile for Visually Challenged etc.	
	5.3	Safety Provisions: Pedestrian Railings, Anti-skid Flooring, Pedestrian Signal, Walk Button, etc.	
6	Unit 06: Traffic Signs and Road Markings		8
	6.1	Type for Traffic Signs Principles and Types of Traffic Signs Danger Signs, Prohibitory Route Signs, Marker Mandatory Signs, Informatory Signs, Indication Signs, Direction Signs, Place Identification Signs etc. Reflective Signs. LED Signs. Static and Dynamic Signs.	
	6.2	Standards for Traffic Signs: Location, Height and Maintenance of Traffic Signs	
	6.3	Types of Road Markings: Centre Lines, Traffic Lane Lines, Pavement Edge Lines, No Overtaking Zone Markings, Speed Markings, Hazard Markings, Stop Lines, Pedestrian Crossings, Cyclist Crossings, Route Direction Arrows, Word Messages, Marking at Intersections, etc. Material, Color and Typography of the Markings.	



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Sessional work: Class Assignments and group work for applications of transportation planning strategies on traffic issues.

Reference material:

1	R Srinivasa Kumar, Introduction to Traffic Engineering, 2018
2	Kadiyali LR, Traffic Engineering and Transport Planning, KHANNA PUBLISHERS, 1 January 1999.
3	Road Safety Signage and Signs Ministry of Road Transport and Highways. Government of India
4	MORT&H Pocketbook for Highway Engineers 2019 (Third Revision)
5	Publications UTTIPEC namely, Street Design Guidelines UTTIPEC Guideline for Road Markings, UTTIPEC Guideline and Specification for Crash Barriers, Pedestrian Railing and dividers, UTTIPEC Standard Typical Crossing Design
6	Ernst Neufert, Neufert Architects' Data, Wiley, 28 August 2023



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Course Plan

Course Title: Earthquake Resistant Architecture	
Course Code: 201AR508-B	Semester: X
Teaching Scheme: L-T-P: 2-0-2	Credits: 4
Evaluation Scheme: ISE + MSE: 20+30	ESE (TH): 50

Course Description:

This course deals with fundamentals and basic terminologies of earthquake. It covers the aspects of site planning for earthquake resistant buildings. It also includes study of performance of ground and buildings during earthquake, seismic codes and building configurations. It explores architectural design parameters for earthquake resistance of the buildings.

Course Objectives:

1	To understand fundamentals and basic terminologies of earthquake.
2	To understand structural behavior and performance of buildings during earthquake.
3	To understand Strategies and concepts in design of earthquake resistant structures.
4	To understand seismic codes

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
1	Explain fundamentals and basic terminologies of earthquake
2	Understand performance of buildings during earthquake.
3	Apply seismic codes of earthquake in design of earthquake resistant buildings.
4	Understand social aspects like awareness and process of rehabilitation and risk mitigation during earthquakes.
5	Apply earthquake resistant principles in design of load bearing structures.
6	Apply earthquake resistant principles in design of framed structures.

Prerequisite:

- Basic knowledge of various construction materials.
- Basic knowledge of various construction technologies.
- Basic knowledge of various structural systems.



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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)

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													1	2	
C508.1				1								1			2
C508.2	1	1		1	2		1					1	1		2
C508.3						1							1		3
C508.4						2									2
C508.5	1														3
C508.6	1														3

Unit No.	Course Content		Hrs.
1	Unit 01. Fundamentals and terminologies of earthquake		4
	1.1	Study of Earth's interior	
	1.2	Understanding terminologies: Seismic waves, magnitude, intensity, scale of earthquake, units of measurement and instruments.	
	1.3	Seismic zones of India	
	1.4	Causes and consequences of earthquake	
2	Unit 02 Building performance during earthquake		8
	2.1	Behavior of structure during earthquake.	
	2.2	Damage to structure during earthquake.	
	2.3	Study of Indian and International earthquake disaster patterns	
3	Unit 03 Seismic codes		8
	3.1	Importance of seismic design codes for earthquake resistant buildings	
	3.2	Indian standard seismic codes	
4	Unit 04. Social aspects regarding earthquake		12
	4.1	Safety awareness education	
	4.2	Rehabilitation of earthquake victims	
	4.3	National Earthquake Risk Mitigation Project (NERMP)	
5	Unit 05 Virtues of Earthquake resistant building		12
	5.1	Structural configuration	
	5.2	Lateral stability	
	5.3	Ductility	
	5.4	Lateral Stiffness	
	5.5	Deformability	



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6	Unit 06 Earthquake resistant principles		16
	6.1	Earthquake resistant principles (materials, methods and configurations) for load bearing structures.	
	6.2	Earthquake resistant principles (materials, methods and configurations) for framed structures.	

Sessional work:

1. Notes
2. Self-study assignments (case study of past earthquakes & report)
3. Drafted sheets on Design configurations and principal
4. Design of earthquake resistant provisions for G + 1 storied load bearing and framed structure.

Reference material:

1	Pankaj Agarwal & Manish Shrikhande, Earthquake Resistant Design of Structures, PHI Publications.
2	Manish Shrikhande & Pankaj Agrawal; Earthquake Resistant Design of Structures, PHI Publication, New Delhi
3	S. K. Duggal; Earthquake Resistance Design of Structures; Oxford University Press, New Delhi.
4	A. K. Chopra; Dynamics of Structures, Pearson Education India; 3rd edition (1 January 2007).
5	Park & Pauly; Behavior of R.C. Structures
6	IS: 1893 (Part-I) 2002, Criteria for Earthquake Resistant Design General Provisions and Buildings, Bureau of Indian Standards, New Delhi.



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Course Plan

Course Title : Valuation of Immovable Properties	
Course Code : 201AR509	Semester : X
Teaching Scheme : L-T-P : 3-0-0	Credits : 03
Evaluation Scheme : ISE: 50	ESE (OE): 50

Course Description:

The valuation of immovable properties in the architecture field is an important aspect that needs to be considered. The ability to adapt and respond to changing stakeholder needs is crucial for the long-term value of enduring systems. Adaptable architectures offer the means to alter system properties and react to changes, ensuring that the system can fulfill its potential life-cycle value. The valuation of immovable properties can be influenced by factors such as age, with the right of use being sold at lower prices as the buyer's age increases. Overall, the valuation of immovable properties in the architecture field involves considering adaptability, stakeholder needs, and utilizing frameworks like VASA

Course Objectives:

1	To understand the concept of valuation of properties and land
2	To understand the various acts related to valuation of immovable properties
3	To understand the role of architect

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
1	Apply Principles of Valuation
2	Understand the Rental Valuation
3	Apply Methods of Valuation of properties
4	Apply Methods of Valuation of land
5	Understand Acts of Valuation
6	Understand professional practices in Valuation

Prerequisite: Basic knowledge of estimation and current rates for different construction materials.



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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)

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													1	2	
													1	2	
C509.1	1			2						1			1	1	3
C509.2	1			2						1			1	1	2
C509.3	1			3					3	1			1	1	3
C509.4				3					3	1			1		3
C509.5				2	1	2		2		3			2		2
C509.6				1	3	2		2		2			2		2

Unit No.	Course Content	Hrs.
1	Unit 01 Principals of Valuation	6
	1.1 Basic understanding of concepts like Price, cost and Value of any commodity. Concept of depreciation and types of values. Nature of value, fair market value and open market price, supply and Demand.	
	1.2 Property as an Investment, percentage Yield of Investments, Interest Rates on Investments in Land and Buildings	
	1.3 Valuation of like interests, property as an investment, Development of properties. Comparison with other types of Investment.	
2	Unit 02 Rental Valuation	9
	2.1 Economics and Legal factors affecting Rent	
	2.2 Methods of Determination of Rental value	
	2.3 Effect of Capital Improvements on Rental Value	
	2.4 Outgoings: Municipal and other Taxes, Repairs, Sinking Funds, Insurances Management.	
	2.5 Nature and use of Valuation Tables	
3	Unit 03 Valuation of properties	9
	3.1 Methods of valuation, Analysis of Rental and sales, Direct comparisons of Capital value, valuation by reference to cost valuation by reference to profits.	
	3.2 The residual or development method, Rental method of Valuations Land and Building method, Modern Developments, Methods of costs of Building works.	
	3.3 Valuation of fully developed, Fully Tenanted, partly & fully Occupied properties	
	3.4 Valuation of under-developed properties, Properties Rental out or given on Leave and License basis	



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4		Unit 04 Valuation of Land	9
	4.1	Situation, size shape, Reversion to land value, Technical & physical conditions of lands	
	4.2	Methods, of Valuation of land, problem of Continuance of Income Reversion to land value, Encumbrance on land.	
	4.3	Valuation for mortgage, probate, advancing finance, bank loans, compulsory acquisition, standard rent court orders, suction reserve acquisition.	
5		Unit 05 Acts of Valuation	9
	5.1	State and Central Government acts.	
	5.2	Affecting valuation, Income tax Act regarding Land Ceiling Act, Compensation Act, Town Planning Act.	
	5.3	Valuation for acquisition and compensation	
6		Unit 06 Professional practices in Valuation	3
	6.1	Concept of Network like VASA (Value Added Service Analyzer)	
	6.2	Introduction to Indian Institution of Valuation- Eligibility criteria, licensing process.	

Sessional work:

1. Class notes
2. Assignments on each unit
3. Valuation case study

Text Book:

1	Namavati Roshan H., Theory and Practice of Valuation,
2	Dange M. N., Valuation of IMMOVABLE PROPERTIES, The University of Virginia, 1973

Reference Books:

1	J A Parks, Principles & Practice Of Valuation Eastern Law House.
2	K. S. Nagarajaiah, Principle And Practice For Valuation Of Land And Building, K. S. Nagarajaiah, (14 August 2022)



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Course Plan

Course Title: Building Information Modeling - II	
Course Code: 201AR510	Semester: X
Teaching Scheme: L-T-P: 1-0-3	Credits: 4
Evaluation Scheme: ISE: 50	ESE (OE): 50

Course Description:

This Course includes the study of Building Information Modeling (BIM) and Mechanical, Electrical, and Plumbing (MEP) design within the Revit environment. Various aspects of Revit MEP, from mastering the software interface and collaborative work-sharing principles to conducting advanced HVAC load analysis and creating custom parametric families will be introduced to the students. With a focus on practical application and hands-on learning, students will be able to work on lighting design, power and communications integration, plumbing system design, and precise project documentation. This course will give a comprehensive skill set essential for success in modern architectural and engineering design practices.

Course Objectives:

1	To understand the fundamentals of Revit MEP software
2	To acquire skills in monitoring and tracking changes within shared Revit models
3	To learn advanced HVAC load analysis methods
4	To develop skills in creating custom parametric families.
5	To explore tools and workflows for designing electrical systems.
6	To learn drafting and detailing tools for creating precise drawings

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C510.1	Demonstrate proficiency in navigating the Revit MEP interface
C510.2	Exhibit the ability to monitor and track changes in shared Revit models
C510.3	Apply advanced HVAC load analysis techniques to optimize system performance.
C510.4	Create custom parametric families for MEP components.
C510.5	Exhibit expertise in designing efficient lighting layouts using Revit MEP.
C510.6	Understand advanced plumbing design techniques and detailing, ensuring accurate and comprehensive project documentation

Prerequisite: Revit Structure



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													1	2		
C510.1					2									1	3	3
C510.2					2						1			1	3	3
C510.3				1	2									1		3
C510.4					2									1		6
C510.5					2									1		3
C510.6					3									1		2

Unit No.	Course Content	Hrs.
1	Unit 01 An Introduction to Revit MEP and Work sharing	8
	1.1 Introduction to Revit MEP Design	
	1.2 Graphical User Interface – Ribbon, Tabs, Contextual tabs, Family Editor tabs, Customizing ribbon, Quick access toolbar, Options Bar, Properties Palette, Project Browser, View Control Bar, Status Bar, Info center	
	1.3 User Interface Control - Menu and Settings, Keyboard Shortcuts, Graphics, Context Menus	
	1.4 Collaboration - Central files, Create a New work set, Create a new Local file, Synchronizing a Local file with Central file, Working with model elements and their work sets, Deleting a work set, Control visibility and work sets	
	1.5 Work sharing - Working with Linked Revit file, Placing Link Revit file, Using Shared Coordinates, Managing Revit Links, Controlling Visibility of Revit Links	
2	Unit 02 Monitoring Elements within Shared Models and HVAC Cooling and Heating Load Analysis-I	8
	2.1 Copy/Monitor, Copy Elements from a Linked Model, Monitor Elements in a Linked Model, Copy/Monitor Workflow for Linked Models, Reviewing Warnings for Monitored Elements, Actions for Coordination Review, Stopping Element Monitoring, Link CAD Files	
	2.2 Space Modeling: Placing Spaces, Space Property Schedule, Modify Space Properties, Zones, Building Construction	



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		Unit 03 Performing Heating and Cooling Load Analysis Supply Airflow schedule and HVAC Cooling and Heating Load Analysis-II
3	3.1	Load Analysis, Weather Data, Outdoor Air Filtration, Details, Heating and Cooling loads report
	3.2	Logical systems, Mechanical settings, System Browser
	3.3	Setting Up Air Systems: Parameters
	3.4	Mechanical System & Duct Work: Air distribution components
	3.5	Mechanical Equipment Components: Air Conditioning/Handling Units, VAV Boxes
	3.6	Duct Work: Create New duct Types, Flex Duct, Automatic Duct routing, Manual Duct routing, Duct Justification, Duct Sizing, Duct add and remove Insulation, Add Lining and Remove lining, Check systems, System Inspector, Duct Pressure Loss report, Color Fill Legend & Duct Legend
	3.7	Mechanical Piping System: Parameters, Creating Pipe Systems, Creating Pipe Types, Selecting Fitting for Pipe Types, Mechanical pipe settings
	3.8	Pipe Routing Options: Automatic & Manual Pipe Routing
	3.9	Pipe Fittings: Using Pipe Fitting controls & Placing Fittings System Filters
		Unit 04 Family Creation and Solid Modeling
4	4.1	Reference Planes and Lines, Constraints and Dimensions
	4.2	Parameters: Types of parameters, Instance Parameters, Parameter Discipline, Type, Grouping
	4.3	3 kinds of Family: System Families, Loadable Families, In-Place Families, Family Editor Tools, Type Catalog Family
	4.4	Extrusions, Blends, Revolves, Sweeps, Swept Blends, Join geometry, Voids, Visibility control
	4.5	Equipment connectors: Pipe connectors, Electrical connectors, Duct connectors
	4.6	Mechanical Equipment Creation
		Unit 05 Efficient Lighting Design and Power and Communications
5	5.1	Spaces and Lighting, Reflected Ceiling plan, Lighting Analysis, Light Fixtures, Ceiling changes, Overhead fixtures, Wall – mounted lights, Switches Site Lighting: Site lighting layout & Analysis
	5.2	Modeling Methods for Power and Systems Devices, Using Annotation Symbols, Using Face-Hosted Families, Avoiding Interference of Symbols, Creating Circuits
	5.3	Creating a Fire Alarm System Model: Fire Alarm Riser Diagram, Fire Alarm Diagram Using Drafting Tools and Symbols
	5.4	Placing Devices and Equipment Connections: Disconnect Switches, Distribution Equipment and Transformers, Switchboards, Panels
	5.5	Creating Power Distribution Systems: Power Diagrams, Modeling Conduit and Cable Tray, Defining Electrical Settings, Placing Conduit in a Model, Placing Cable Tray in a Model, Circuiting and Panels, Establishing Electrical Settings, Wiring Settings, Voltage Definitions, Distribution Systems, Load Calculations
	5.6	Creating Circuits and Wiring for Devices and Fixtures: Editing Wiring, Editing Circuits, Drawing Wires Manually
	5.7	Electrical Equipment Creation
	5.8	Lighting fixture creation



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		Unit 06 Plumbing and Drafting and Detail Tools	
6	6.1	Working with Plumbing Fixtures, Copy/Monitor Plumbing Fixtures, Sloping Pipe, Annotating Invert Elevation and Slope, Using Fittings, Using Pipe Fitting Controls, Placing Valves, Setting Visibility of Piping, Pipe Justification, Pipe Sizing, Pipe add insulation & remove insulation, Pipe Pressure loss report	12
	6.2	Fire Protection: Point of Connection, Fire Pump Assembly, Fire Riser Assembly, Sprinkler Heads Creating Fire Protection Systems; Creating a Fire Protection Wet System, Filtering Fire Protection Systems, Fire Protection Pipe Settings and Routing	
	6.3	Line Styles, Regions, Detail Components, CAD Details, Drafting Views, Detail Library, Detail Views	
	6.4	Sheets: Creating a Title block, Using Existing CAD Graphics, Sheets in a Project File, Placing Views on Sheets, Viewports Properties, Annotations, Schedules, Sheet Revisions, Printing Sheets, Export	

Sessional work: Two assignments based on the above units.

Reference material:

1	BIM Handbook A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors Chuck Eastman Paul Teicholz Rafael Sacks Kathleen Liston
2	Building Information Modeling: Planning and Managing Construction Projects with 4D CAD and Simulations (McGraw-Hill Construction Series), 1st Edition McGraw Hill
3	Building information modeling using Revit for Architects and Engineers, Mavs Open Press



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Course Plan

Course Title: Remote Sensing (R.S) and Geographic Information System (G.I.S)	
Course Code : 201AR511-A	Semester: X
Teaching Scheme: L-T-P: 2 – 0 - 2	Credits: 4
Evaluation Scheme: ISE: 50	ESE (OE): 50

Course Description:

Students of Architecture are expected to manage the site which involves taking measurements, surveying and inspection, one of the main concerns which is required to be carried out for the development of township, residential colonies, public buildings etc in the survey work. Therefore, skills of modern surveying are very essential.

Course Objectives:

1	To understand the evolution of Remote Sensing and G.I.S
2	To understand a basic and advanced level insight into the approach of latest remote sensing techniques
3	To understand the subject of Geographical information system as an extension of application software in Architectural field.

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C511.1	Understand the concept of G.I.S. Technology.
C511.2	Understand the concept of Space System.
C511.3	Understand the concept Geo morphology
C511.4	Apply knowledge of G. I. S
C511.5	Apply techniques of RS and G.I.S
C511.6	Understand use of various softwares in RS and G.I.S

Prerequisite: Knowledge of current trends in architecture including design, construction technology and material.



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													1	2	
C511.1			1	1			2					2	2		2
C511.2			1	1			2					2	2		2
C511.3			1	1			2					2	2		2
C511.4			1	1			1		3	3		1	1	3	3
C511.5			2	2	2		1		3	3		1	1	3	3
C511.6			1	2	3								1	3	2

Unit No.	Course Content	Hrs.
1	Unit 1: Introduction	12
	1.1 Definition, History, Types of satellites based upon uses, Programs of different countries, India's position, etc.	
	1.2 Scope - Various fields of applications, Users in India, Data requirements of users. Topo sheets, Evolution of G.I.S. Technology.	
2	Unit 02: Space System:	8
	2.1 Technique of aerial photography, Photographic flight mission, Factors influencing flight mission, Numbering of aerial photographs. Remote Sensing Technique of satellite imaging - Important units of satellite and functioning of satellite, height, and coverage.	
	2.2 Stages in remote sensing Electromagnetic radiation, and electromagnetic spectrum, Interaction of electromagnetic radiation with atmosphere and earth surface.	
	2.3 Sensors, Types of Resolutions used in remote sensing. Introduction to the application of computer in analysis of satellite pictures, Digital Image processing.	
3	Unit 03: Geomorphology	12
	3.1 Geomorphology and its scope in photo interpretation as well as in Architecture field, Drainage analysis, Drainage patterns, Drainage density and Drainage frequency.	
	3.2 Landforms associated with igneous, secondary and metamorphic rocks, Landforms developed due to structural features like dip strike, fractures, faults, folds etc.	



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4		Unit 04. G.I.S-	12
	4.1	Fundamentals of GIS, Definition, Components, Types of data inputs in GIS, spatial data, thematic characteristics, rasters and vectors, databases and database management.	
5		Unit 05: Application of RS and G.I.S :	8
	5.1	In the study and selection of site or hydraulic structures, Application in urban planning.	
	5.2	Use in Landslide, Application in transportation engineering.	
	5.3	Land use study, Terrain analysis, and soil mapping with the help of remote sensing techniques, Applications in delineating forest areas.	
6		Unit 06: Softwares used in G.I.S.	8
	6.1	Introduction about different softwares available in G.I.S.	
	6.2	Hands on basic softwares like ArcGIC and QGIS.	

Sessional work:

1. Study of topo sheets.
2. Preliminary study of aerial photographs – scale, ground coordinates, and mosaic.
3. Determination of elevations of different points with the help of mirror stereoscope and parallax bar.
4. Study of drainage density, drainage pattern, watershed from Soil and water Maps.
5. Ground truth data collection using Total station and G.P.S.
6. G.I.S- Open Source Quantum GIS.

For practical's.

- a. Georeferencing of toposheets.
- b. Vectorisation (digitization) of raster Images.
- c. Converting Google map kml files into shape files.

Text Book:

1	C.S.Agrawal and P.K.Garg, Text book on Remote Sensing, Wheeler Publishing, New-Delhi.
2	Introduction to geomatics –QGIS user guide – Mr.C.V. Nishinkanth, Mrs.Annu Nishinkanth, Dr S S Vasudevan, Dr P Ramkumar, Publishers

Reference Books:

1	Sabins F. F., Remote Sensing, Principles and Interpretation, W. H. Freeman & Co.
2	Reddy Anji, G.I.S-, Publishers- MGH



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Course Plan

Course Title: Emerging Trends in Architecture	
Course Code: 201AR511-B	Semester: X
Teaching Scheme: L-T-P: 2 – 0 - 2	Credits: 4
Evaluation Scheme: ISE: 50	ESE (OE): 50

Course Description:

The course emphasizes on emerging advances and trends in architecture. It discusses contemporary practices of advanced design, construction technology and materials and envisages the future needs. It will also encompass an introduction to upcoming digital technologies.

Course Objectives:

1	To discuss emerging practices in architecture.
2	To study organic architecture and its implementations.
3	To discuss upcoming building parametric.
4	To study emerging managerial practices in architecture.
5	To discuss basics of computational design in architecture.
6	To study futuristic architectural spaces.

Course Outcomes (COs):

COs	At the end of successful completion of course, the students will be able to...
C511.1	Understand emerging sustainable practices in architecture.
C511.2	Analyze implementations of organic architecture.
C511.3	Understand aspects of parametric architecture.
C511.4	Study upcoming practices in construction management.
C511.5	Understand the basics of computational design in architecture.
C511.6	Analyze futuristic architectural spaces.

Prerequisite: Knowledge of current trends in architecture including design, construction technology and material.



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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)

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													1	2		
C511.1				2		2	2							1		2
C511.2							1							1		4
C511.3					2											2
C511.4						1	1				1	1		1		3
C511.5				1												2
C511.6				1			2									4

Unit No.	Course Content	Hrs.
1	Unit 01: Emerging practices	12
	1.1 Introduction to emerging practices	
	1.2 Emerging sustainable material and technologies	
	1.3 Government or any other authority initiatives	
	1.4 Net- Zero technologies	
	1.5 Neo- Vernacular style	
2	Unit 02: Organic architecture	8
	2.1 Introduction to the concept of organic architecture	
	2.2 Bio-mimicry	
	2.3 Biophilic Designs	
	2.4 Examples, study & analysis (forms, material, elements, technologies)	
3	Unit 03: Parametric Architecture	8
	3.1 Introduction to building parametric - Kinetic geometry, Parametric geometry, advanced BIM, 3D Printing (robotics), Examples of parametric architecture.	
4	Unit 04: Emerging practices in construction management	12
	4.1 Introduction to emerging managerial practices in architecture	
	4.2 BIM- Primavera	
	4.3 Agile practices	
	4.4 MNCs	



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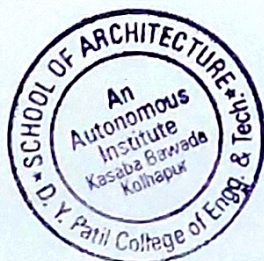
5		Unit 05: Emerging trends in computational design	8
	5.1	Introduction of computational design	
	5.2	IOT, VR, AI, XR (VR+AR+MR)	
	5.3	Cloud computing	
6		Unit 06: Emerging trends in future spaces	12
	6.1	Introduction of future spaces	
	6.2	Smart cities, smart buildings	
	6.3	Multifunctional spaces	
	6.4	Mobile houses	
	6.5	Floating architecture	
	6.6	Vertical cities	

Sessional work:

- Assignments (file-based, sheets)
- Online case study report

Reference material:

1	Illusion in Design: New Trends in Architecture and Interiors
2	Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life Book by Judith Heerwagen, Martin Mador, and Stephen R. Kellert
3	Beyond geometry, Studio Bryan Garcia Agudelo



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