SYLLABUS FOR
5-YEAR B. ARCH. PROGRAM

DEPARTMENT OF ARCHITECTURE

SCHOOL OF ARCHITECTURE, PLANNING & GEOMATICS

IUST, AWANTIPORA

List of Courses for 5-year B. Arch Course:

Subject Code		Subject Name	Total Credits	Total Marks
ARC	01C	Architectural Design	91	4550
ARC	02C	Building Construction and Materials	28	1400
ARC	03C	Architectural Drawing	08	400
ARC	04C	Humanities and History of Architecture	15	750
ARC	05C	Theory of Structures	12	600
ARC	06C	Arts and Graphics	05	250
ARC	07F	Communication Skills	02	100
ARC	08F	Environmental Studies and Climate Change	02	100
ARC	09C	Workshop and Model Making	02	100
ARC	10C	Building Sciences	04	200
ARC	11C	Measured Drawing	03	150
ARC	12C	Surveying and Levelling	02	100
ARC	13C	Building Services	08	400
ARC	14C	Site Planning and Landscape	04	200
ARC	15O	Open Elective / MOOCs	08	400
ARC	16E	Discipline Centric Elective / MOOCs	12	600
ARC	17C	Interior Design	04	200
ARC	18C	Estimation, Costing and Valuation	03	150
ARC	19C	Working Drawing	02	100
ARC	20C	Town Planning and Settlement Study	02	100
ARC	21C	Building Economics and Project Management	03	150
ARC	22C	Building Bye-Laws, Universal Design and Inclusive Design	03	150
ARC	23C	Architectural Internship / Practical Training Seminar	26	1300
ARC	20F	Research Methodology	02	100
ARC	25C	Dissertation - Thesis Preparatory	03	150
ARC	26C	Climate Change and Disaster Management	02	100
ARC	27C	Building Information Modelling	02	100
ARC	28C	Professional Practice	02	100
		Total Credits / Marks	**260**	**13000**

Notations:

C	-CORE COURSES
F	-FOUNDATION COURSES
E	-DISCIPLINE CENTRIC ELECTIVE
OE	-OPEN ELECTIVE
IA	-INTERNAL ASSESMENT
WE	-WRITTEN EXAM
VV	-VIVA VOCE

NOTE:

- Each Semester will be of 16 teaching weeks.
- Number of Classes per week = 30.
- Exams will be held after each 16-week semester (excluding exams).
- Semester VII will cover the Practical Training of the students and no class work will be held for such semesters.
- Each credit comprises of Lecture / Tutorial / Studio of duration 50 – 60 minutes.
- Each credit comprises of 50 marks.
- The entire curriculum of five years will be divided into two stages, first three years will constitute Stage – 1 devoted to basic course and next two years will constitute Stage – 2, the advanced stage.
- A candidate shall not be promoted to Stage – 2 unless he / she passes all the examinations of Stage – 1 of the course.

The USP of the Architectural Program is the Architecture of the Himalayan region which shall be reflected in its syllabus.

The syllabus shall focus on the study of hill architecture and settlements, emphasizing materials, construction techniques and contemporary transformative processes under the larger umbrella of Himalayan Architecture through design studios of various semesters and general and departmental electives. Specific subjects around this need to be included in the program. It will allow the development of new knowledge and standard practices about local architecture vis-a-vis the western concepts followed in architectural education, provide a 'niche' to the program, and open up possibilities to collaborate with other institutions working on similar hill/Himalayan architecture. In order to increase the exclusivity of the programme and for marketing purpose, the course will offer specialised courses on the architecture and built form of the Himalayan belt as part of electives/studio. In the same context, the programme will be at the forefront of studying and dealing with the important and contemporary challenges of climate change and suitability.

Each faculty member may propose two electives each based on their area of expertise/research and catering towards the study/research which may be floated accordingly.

Study tours need to be integrated with the courses like Architectural Design Studio, History of Architecture, and Theory of Structures to expose students to live/existing examples. These can be taken up within Kashmir, Northern India, and other parts of the country. A short study tour to these regions, cities and settlements of historical and architectural importance is a vital and integral part of the architectural education as recommended in the Council of Architecture Guidelines 2020.

The emphasis shall be laid on groupwork of students for courses having design studios, seminars, electives, etc.

Semester wise distribution of course credits:

Subject Code	Sem 1 (code/ credits)	Sem 2 (code/ credits)	Sem 3 (code/ credits)	Sem 4 (code/ credits)	Sem 5 (code/ credits)	Sem 6 (code/ credits)	Sem 7 (code/ credits)	Sem 8 (code/ credits)	Sem 9 (code/ credits)	Sem 10 (code/ credits)
ARC01C	ARC101C/07	ARC151C/07	ARC201C/07	ARC251C/08	ARC301C/08	ARC351C/09	ARC401C/09		ARC501C/12	ARC551C/20
ARC02C	ARC102C/04	ARC152C/04	ARC202C/04	ARC252C/04	ARC302C/04	ARC352C/04	ARC402C/04			
ARC03C	ARC103C/04	ARC153C/04								
ARC04C	ARC104C/04	ARC154C/03	ARC204C/04	ARC254C/04						
ARC05C	ARC105C/02	ARC155C/02	ARC205C/02	ARC255C/02	ARC305C/02	ARC355C/02				
ARC06C	ARC106C/03	ARC156C/02								
ARC07F	ARC107F/02									
ARC08C		ARC158F/2								
ARC09C		ARC159C/02								
ARC10C			ARC210C/04							
ARC11C			ARC211C/03							
ARC12C			ARC212C/02							
ARC13C				ARC263C/02	ARC313C/03	ARC363C/03				
ARC14F				ARC264C/04						
ARC15C				ARC265O/02	ARC315O/02		ARC415O/02		ARC515O/02	
ARC16C					ARC316E/03	ARC366E/03	ARC416E/03		ARC516E/03	
ARC17O					ARC317C/04					
ARC18E						ARC368C/03				
ARC19C						ARC369C/02				
ARC20F							ARC420C/02			
ARC21C							ARC421C/03			
ARC22C							ARC422C/03			
ARC23C								ARC473C/26		
ARC24C									ARC524F/02	
ARC25C									ARC525C/03	
ARC26C									ARC526C/02	
ARC27C									ARC527C/02	
ARC28C										ARC578C/02

Course Objectives

Architectural Design (ARC-01C):

- Understand Architectural Principles: Students will demonstrate an understanding of fundamental architectural principles such as proportion, scale, balance, rhythm, symmetry, and harmony.
- Apply Design Process: Students will apply the architectural design process, including conceptualization, research, analysis, synthesis, and presentation, to develop creative and innovative design solutions.
- Explore Spatial Relationships: Students will explore and manipulate spatial relationships to create functional, aesthetically pleasing, and contextually responsive architectural designs.
- Integrate Contextual Factors: Students will integrate cultural, social, environmental, historical, and economic factors into their design proposals, demonstrating an understanding of how architecture responds to its context.
- Promote Sustainability: Students will incorporate principles of sustainable design and environmental responsibility into their architectural projects, including energy efficiency, passive design strategies, and the use of sustainable materials.
- Develop Critical Thinking Skills: Students will develop critical thinking skills to analyse design problems, evaluate design options, and make informed decisions based on research, analysis, and conceptual frameworks.
- Foster Collaboration: Students will engage in collaborative design processes, working effectively in teams to address complex design challenges and opportunities.

Building Construction and Materials (ARC-02C):

- Understanding Construction Techniques: Students will gain an understanding of various construction techniques, including traditional and contemporary methods, and their application in architectural design.
- Knowledge of Building Materials: Students will learn about different types of building materials, such as concrete, steel, wood, masonry, glass, and composites, including their properties, strengths, weaknesses, and suitability for different applications.
- Building Systems Integration: Students will explore how building materials and construction techniques integrate with building systems, including structural, mechanical, electrical, and plumbing systems.
- Building Performance Evaluation: Students will evaluate the performance of building materials and construction assemblies in terms of structural integrity, durability, thermal performance, acoustics, and fire resistance.
- Hands-on Experience: Students will have opportunities for hands-on learning through construction site visits, material sampling, mock-up construction, and building component fabrication.
- Critical Thinking and Problem Solving: Students will develop critical thinking skills to analyse construction problems, propose solutions, and make informed decisions regarding material selection, construction techniques, and building performance.

Architectural Drawing (ARC-03C):

- Technical Drawing Skills: Develop proficiency in creating accurate and precise architectural drawings using drafting tools, techniques, and conventions.
- Architectural Representation: Understand the principles of architectural representation, including orthographic projection, axonometric projection, isometric projection, and perspective drawing.
- Scale and Proportion: Learn to work with scales and proportions effectively to accurately represent architectural elements and spaces in drawings.
- Spatial Visualization: Enhance spatial visualization skills to translate three-dimensional architectural ideas into two-dimensional drawings and vice versa.
- Annotation and Dimensioning: Learn to annotate architectural drawings with labels, notes, and dimensions to convey information accurately and comprehensively.

Humanities and History of Architecture (ARC-04C):

- Understanding Architectural History: Gain knowledge of major architectural movements, styles, and periods from antiquity to the present day, including their historical contexts, key figures, and significant works.
- Cultural Context: Explore the cultural, social, political, economic, and technological factors that have influenced the development of architecture throughout history and across different regions and civilizations.
- Cross-Cultural Perspectives: Compare and contrast architectural traditions and practices across different cultures, civilizations, and geographical regions, and explore the interconnectedness of global architectural history.

- Contemporary Relevance: Investigate the relevance of historical architectural knowledge and precedents to contemporary architectural practice, and explore how historical insights can inform sustainable, culturally sensitive, and socially responsible design solutions.

Theory of Structures (ARC-05C):

- Fundamental Concepts: Understand the fundamental concepts of structural mechanics, including equilibrium, stress, strain, deformation, and stability, as applied to architectural structures.
- Structural Components: Familiarize with different types of structural elements and components used in buildings, including beams, columns, trusses, frames, and arches, and understand their functions and behaviour.
- Structural Loads: Learn to analyse and quantify different types of loads acting on buildings, including dead loads, live loads, snow loads, wind loads, and seismic loads, and their effects on structural performance.
- Structural Systems: Explore different types of structural systems commonly used in buildings, including load-bearing systems, frame systems, and shell structures, and understand their advantages, limitations, and architectural implications.
- Structural Behaviour: Understand the behaviour of structural systems under various loading conditions, including bending, shear, axial forces, torsion, and dynamic loads, and how they influence structural design.

Arts and Graphics (ARC-06C):

- Drawing Skills Development: Develop proficiency in freehand drawing techniques, including sketching, shading, and rendering, to effectively communicate architectural ideas and concepts.
- Graphic Representation: Learn to create clear and expressive architectural drawings, diagrams, and renderings using various media and tools, including pencils, pens, markers, water-colours, and digital software.
- Composition and Layout: Understand principles of composition and layout in graphic design, including balance, rhythm, proportion, hierarchy, and visual hierarchy, and apply them to architectural drawings and presentations.
- Colour Theory and Application: Explore principles of colour theory and learn to use colour effectively in architectural drawings and renderings to evoke mood, express meaning, and enhance visual impact.
- Digital Graphics Skills: Develop proficiency in using digital graphic software tools, such as AutoCAD, Adobe Photoshop, Illustrator, and SketchUp, for architectural drawing production, image editing, and presentation preparation.

Communication Skills (ARC-07F):

- Verbal Communication: Develop the ability to articulate architectural ideas, concepts, and design intentions clearly and persuasively in verbal presentations, critiques, and discussions.
- Listening Skills: Improve active listening skills to understand client needs, project requirements, and feedback from peers and stakeholders, and to respond appropriately in design discussions and meetings.
- Presentation Skills: Enhance presentation skills to effectively communicate architectural designs and proposals through oral presentations, multimedia presentations, and public speaking engagements.
- Critique and Feedback: Learn to give and receive constructive criticism and feedback on architectural projects, presentations, and design ideas in a respectful and professional manner.
- Technical Writing: Learn to write clear, concise, and well-organized technical documents, including design briefs, project proposals, design reports, meeting minutes, and specifications, for architectural projects.

Environmental Studies and Climate Change (ARC-08F):

- Understanding Environmental Issues: Gain knowledge of key environmental issues facing the built environment, including climate change, resource depletion, pollution, habitat destruction, and loss of biodiversity.
- Climate Change Awareness: Understand the causes, impacts, and consequences of climate change on the built environment, including rising temperatures, sea-level rise, extreme weather events, and their effects on human settlements and ecosystems.
- Renewable Energy Integration: Understand the principles of renewable energy systems, including solar photovoltaic, solar thermal, wind, biomass, and geothermal energy, and learn to integrate them into architectural design to reduce reliance on fossil fuels and mitigate greenhouse gas emissions.
- Resilient Design and Adaptation: Understand the principles of resilient design and adaptation to climate change, including flood-resistant design, coastal resilience, heat island mitigation, and disaster preparedness, to enhance the long-term sustainability and resilience of architectural projects.

- Environmental Regulations and Policies: Familiarize with environmental regulations, policies, and green building codes governing sustainable design and construction practices, and understand their implications for architectural projects and professional practice.

Workshop and Model making (ARC-09C):

- Introduction to Workshop Tools: Familiarize students with the basic tools and equipment commonly found in architectural workshops, including hand tools (e.g., saws, drills, hammers), power tools (e.g., jigsaws, sanders, routers), and model-making supplies (e.g., balsa wood, foam board, acrylic sheets).
- Model Making Techniques: Teach students a variety of model-making techniques, including cutting, shaping, joining, and finishing materials such as wood, plastic, foam, and paper, to create architectural models at different scales and levels of detail.
- Digital Fabrication Technologies: Introduce students to digital fabrication technologies, such as laser cutting, 3D printing, and CNC milling, and teach them how to incorporate these tools into their model-making workflow to enhance precision and efficiency.
- Material Exploration: Encourage students to experiment with a range of materials, textures, and finishes in their model making, fostering creativity and innovation in the exploration of architectural form, structure, and materiality.

Building Sciences (ARC-10C):

- Understanding Climate: Gain knowledge of climatic factors that influence architectural design, including temperature, humidity, solar radiation, wind patterns, precipitation, and microclimatic conditions.
- Bioclimatic Design Principles: Explore principles of bioclimatic design, including passive design strategies, solar orientation, natural ventilation, shading devices, and thermal mass, to optimize building performance and occupant comfort in response to climate conditions.
- Day lighting Design: Understand the principles of day lighting design and how to optimize natural daylight penetration in buildings to reduce reliance on artificial lighting, enhance visual comfort, and minimize energy consumption.
- Thermal Comfort: Learn about factors influencing thermal comfort in buildings, including air temperature, humidity, air movement, radiant heat transfer, and occupant activity, and how to design for optimal thermal comfort conditions in different climates.
- Building Acoustics: Understand the principles of sound and human perception of sound, and how to design acoustically stable architectural spaces including methods of enhancing the speech intelligibility and noise control.

Measured Drawing (ARC-11C):

- Understanding Architectural Documentation: Gain an understanding of the importance of measured drawings in architectural practice for documentation, preservation, renovation, and adaptive reuse of existing buildings.
- Fieldwork and Documentation: Gain practical experience in conducting fieldwork to measure and document existing buildings, including site visits, field notes, photographs, sketches, and measurements of architectural elements and spaces.
- Historic Preservation and Restoration: Understand the role of measured drawings in historic preservation and restoration projects, including documentation of historic buildings, analysis of original construction techniques, and replication of historic details.

Surveying and Levelling (ARC12C):

- Measurement Methods: Learn surveying measurement methods, including distance measurement (using tapes, electronic distance meters, and total stations), angle measurement (using theodolites and total stations), and elevation measurement (using levels and GPS).
- Topographic Surveys: Gain knowledge of topographic survey methods for mapping the natural and built features of a site, including contour mapping, spot elevations, and feature coding, and learn how to create topographic maps and plans.
- Construction Layout: Learn construction layout techniques for transferring design information from architectural drawings to the construction site, including setting out building corners, gridlines, excavation limits, and foundation locations.
- Global Positioning Systems (GPS): Learn about the principles and applications of GPS technology in surveying, including real-time kinematic (RTK) positioning, post-processing techniques, and GIS data integration.

- Fieldwork and Practical Exercises: Gain hands-on experience through fieldwork and practical exercises, including field surveys, leveling exercises, and site measurements, to apply surveying principles and techniques in real-world scenarios.

Building Services (ARC-13C):

- Introduction to Building Services: Understand the role and importance of building services in supporting the functional requirements of buildings, including occupant comfort, health, safety, and energy efficiency.
- Building Services in Architecture: Understand the working of various building services in architecture including Heating, Ventilation and Air Conditioning (HVAC) Systems, Indoor Air Quality (IAQ), Lighting Systems, Plumbing Systems, Electrical Systems and Fire Protection Systems.
- Interdisciplinary Collaboration: Develop an appreciation for interdisciplinary collaboration between architects, engineers, contractors, and building service consultants in the design, coordination, and integration of building services into architectural projects.

Site Planning and Landscape (ARC-14C):

- Understanding Site Planning: Develop an understanding of the site context, site programming, site circulation and access and open space design.
- Vegetation and Planting Design: Understand principles of vegetation and planting design, including selection of plant species, planting layouts, soil preparation, irrigation, and maintenance practices, to create sustainable and visually appealing landscapes.
- Site Grading and Earthworks: Gain proficiency in site grading and earthworks design to shape the landform, establish site contours, and manage storm water runoff effectively, while minimizing site disturbance and preserving natural features.
- Understanding Historic Landscapes: Develop an understanding of the cultural, historical, and architectural significance of historic landscapes, including gardens, parks, estates, campuses, and cultural landscapes, and their role in shaping human experience and identity.

Open Elective / MOOCs (ARC-15O):

- Interdisciplinary Learning: Foster interdisciplinary learning by providing students with the opportunity to explore subjects outside of architecture that complement and enrich their understanding of the built environment and overall self-development.
- Diversification of Knowledge: Broaden students' knowledge base and perspectives by exposing them to diverse academic disciplines and areas of study, helping them develop a holistic understanding of the complex social, cultural, environmental, and technological contexts in which architecture operates.
- Cross-Disciplinary Collaboration: Foster cross-disciplinary collaboration and integration by offering electives that encourage students to work collaboratively with faculty and students from other departments or disciplines on research projects, design studios, or community engagement initiatives.

Department Centric Electives / MOOCs (ARC-16E):

- Specialized Knowledge: Provide students with specialized knowledge and expertise in specific areas of architectural theory, history, technology, or practice that align with the department's research interests, faculty expertise, or emerging trends in the field.
- Advanced Study: Offer opportunities for students to engage in advanced study and research within a particular sub-discipline or topic area of architecture, allowing them to deepen their understanding and develop expertise beyond the core curriculum.

Interior Design (ARC-17C):

- Introduction to Interior Design: Provide students with an overview of the history, theory, and practice of interior design, including its relationship to architecture, art, and human experience.
- Human Factors and Ergonomics: Understand the principles of human factors and ergonomics in interior design, including anthropometrics, proxemics, and environmental psychology, and learn how to design spaces that accommodate human needs, behaviors, and preferences.
- Material Selection and Specification: Gain knowledge of interior finishes, materials, and furnishings, including their properties, performance characteristics, and applications, and learn how to select and specify appropriate materials for interior design projects.

- Furniture and Fixture Design: Learn about furniture design principles, ergonomic considerations, and furniture selection for interior spaces, and gain skills in space planning, furniture arrangement, and custom furniture design.

Estimation Costing and Valuation (ARC-18C):

- Cost Estimation Methods: Learn various methods and techniques for estimating the costs of architectural projects, including quantity takeoff, unit costing, elemental costing, area-based costing, and parametric estimating, using both manual and computerized approaches.
- Cost Estimation Components: Gain Knowledge of Construction Materials and their pricing, Labour and Equipment costs, Overhead and Profit Margin, etc. to be able to select appropriate materials and components for architectural design and obtain designs within the budgetary framework.
- Cost Control and Value Engineering: Explore strategies for cost control and value engineering to optimize project costs while maintaining quality and performance standards, including value analysis, cost-benefit analysis, and alternative materials and methods.
- Tendering and Bidding Process: Understand the tendering and bidding process for construction projects, including preparation of tender documents, bid evaluation criteria, and contractor selection procedures, and learn how to analyse and compare bids based on cost, qualifications, and performance.

Working Drawing (ARC-19C):

- Construction Documentation: Learn how to create comprehensive construction documentation sets, including plans, elevations, sections, details, schedules, and specifications, to convey design information effectively to contractors, subcontractors, and building officials.
- Building Systems Integration: Learn how to integrate building systems, including structural, mechanical, electrical, plumbing, and HVAC (heating, ventilation, and air conditioning) systems, into architectural drawings to coordinate design elements and ensure functional compatibility.
- Quality Control and Review: Learn how to conduct quality control checks and reviews of architectural drawings to ensure accuracy, completeness, and consistency in construction documentation, and understand the importance of revision tracking and version control in maintaining drawing integrity.

Town Planning and Settlement Study (ARC-20C):

- Urban Planning Principles: Explore principles and theories of urban planning, including land use planning, transportation planning, infrastructure development, zoning regulations, and urban design guidelines, and learn how to apply these principles to create sustainable, liveable, and resilient urban environments.
- Settlement Patterns Analysis: Learn how to analyse settlement patterns and urban form at various scales, including regional, city, neighbourhood, and street level, using mapping techniques, aerial imagery, GIS (Geographic Information Systems), and other spatial analysis tools.
- Community Participation: Understand the importance of community participation and stakeholder engagement in the urban planning process, and learn how to facilitate community meetings, workshops, charrettes, and other participatory planning activities to solicit input and feedback from residents, businesses, and other stakeholders.

Building Economics and Project Management (ARC-21C):

- Understanding Building Economics: Develop an understanding of the economic principles and concepts that govern building projects, including cost estimation, cost analysis, budgeting, financial feasibility, and return on investment.
- Project Scheduling and Planning: Learn how to develop project schedules and plans for building projects, including critical path analysis, activity sequencing, resource allocation, milestone tracking, and project phasing, to ensure timely completion of project milestones and deliverables.
- Quality Management: Explore principles of quality management and quality assurance in building projects, including quality standards, quality control procedures, inspection protocols, and quality assurance processes, to ensure that project deliverables meet specified quality requirements.

Building Bye-laws, Universal Design and Inclusive Design (ARC-22C):

- Understanding Building Bye-laws: Develop an understanding of building bye-laws, regulations and codes; familiarize with legal and regulatory requirements related to building design and construction and learn how to ensure compliance with applicable laws and regulations.
- Understand Accessibility and Universal Design: Develop and understanding of strategies and principles of accessibility and universal design in architecture in context to human factors and ergonomics to be able to create barrier free and equitable access built environments.
- Understand Inclusive Design and Social Equity: Understand the importance of inclusive design principles in promoting social equity, diversity, and inclusion in the built environment, and learn how to address the needs and preferences of diverse user groups, including people with disabilities, seniors, children, and caregivers.

Architectural Internship / Practical Training Seminar (ARC-23C):

- Professional Experience: Provide students with an opportunity to gain practical experience working in a professional architectural practice or related industry setting, allowing them to apply theoretical knowledge gained in the classroom to real-world projects and scenarios.
- Project Participation: Involve students in different stages of architectural projects, from initial concept design and schematic design to design development, construction documentation, and project administration, allowing them to contribute to the design process and project delivery.
- Professional Communication: Enhance students' communication skills, both written and verbal, by engaging them in client meetings, consultant coordination, project presentations, and written correspondence, and teaching them how to communicate effectively with colleagues, clients, contractors, and other stakeholders.
- Team Collaboration: Foster teamwork and collaboration among students and professionals within the architectural firm or project team, encouraging them to work collaboratively on design tasks, problem-solving exercises, and project challenges, and learn from the expertise of experienced professionals.
- Professional Development: Support students' professional development and career readiness by providing opportunities for networking, mentorship, and exposure to different career paths within the architecture profession, and helping them identify their strengths, interests, and goals for future employment or further education.
- Reflective Practice: Encourage students to engage in reflective practice by reflecting on their experiences, learning outcomes, challenges, and achievements during the internship, and facilitating discussions or journaling exercises to help them process their internship experiences and identify areas for growth and improvement.

Research Methodology (ARC24F):

- Research Paradigms and Approaches: Explore different research paradigms, methodologies, and approaches relevant to architecture, and learn how to select appropriate research methods based on research questions, objectives, and theoretical frameworks.
- Ethical Considerations: Familiarize with ethical principles and guidelines governing research conduct in architecture, including informed consent, confidentiality, privacy, integrity, and research ethics review processes, and learn how to address ethical considerations in research design and implementation.

Dissertation - Thesis Preparatory (ARC-25C):

- Research Topic Selection: Assist students in identifying and refining a research topic or area of inquiry for their thesis in architecture, based on their interests, expertise, and the relevance of the topic to contemporary architectural discourse and practice.
- Literature Review: Guide students in conducting a comprehensive literature review to familiarize themselves with existing scholarship, research studies, theoretical frameworks, and methodologies relevant to their chosen research topic or area of investigation in architecture.
- Research Proposal Development: Help students develop a research proposal that outlines the research problem, research questions, objectives, significance, theoretical framework, research methods, data collection techniques, analysis plan, and timeline for their thesis or dissertation project in architecture.

Climate Change and Disaster Management (ARC-26C):

- Understanding Climate Change: Develop an understanding of the science of climate change, including the causes, mechanisms, and effects of global climate change on the natural environment, human societies, and the built environment.
- Climate Adaptation Strategies: Explore strategies for climate adaptation in architecture and urban design, including resilient design principles, climate-responsive design strategies, passive design techniques, and green infrastructure solutions that mitigate the impacts of climate change on buildings and communities.

- Disaster Risk Reduction: Learn about disaster risk reduction strategies and practices aimed at reducing the vulnerability of buildings and communities to natural hazards, including earthquakes, floods, hurricanes, tsunamis, wildfires, and extreme weather events.
- Risk Assessment and Management: Learn how to conduct risk assessments, vulnerability assessments, and hazard mapping exercises to identify and prioritize risks, vulnerabilities, and resilience measures in the built environment, and develop risk management strategies to enhance resilience and reduce disaster risk.

Building Information Modelling (ARC-27C):

- Understanding BIM Principles: Develop an understanding of the principles, concepts, and methodologies of Building Information Modeling (BIM) as applied to architectural design, construction, and facility management processes.
- BIM Software Proficiency: Gain proficiency in using BIM software platforms commonly used in architectural practice, such as Autodesk Revit, ArchiCAD, or Bentley AECOsim, to create 3D digital models of buildings, generate construction documentation, and perform data analysis.

Professional Practice (ARC-28C):

- Legal and Regulatory Knowledge: Develop an understanding of the legal and regulatory framework governing architectural practice, including licensing requirements and professional liability.
- Ethical Standards and Professional Conduct: Familiarize students with ethical standards and principles of professional conduct in architecture, including honesty, integrity, confidentiality, transparency, and accountability, and teach them how to apply ethical principles in their interactions with clients, colleagues, and the public.
- Client Relations and Communication: Develop students' skills in client relations and communication, including client needs assessment, client interviews, project briefing, proposal development, contract negotiation, and client management throughout the project lifecycle.

Semester 1								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC101C	Architectural Design – I	7	175	--	175	7
AE	C	ARC102C	Building Construction and Materials - I	4	100	50	50	4
PC	C	ARC103C	Architectural Drawing – I	4	100	100	--	4
PC	C	ARC104C	Humanities and History of Architecture – I	4	100	100	--	4
AE	C	ARC105C	Theory of Structures – I	2	50	50	--	2
PC	C	ARC106C	Arts and Graphics – I	3	75	--	75	3
AE	F	ARC 107F	Communication Skills	2	50	50	--	2
			TOTAL	26	650	350	300	26
STUDY TOUR								
Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC151C	Architectural Design – II	7	175	--	175	7
AE	C	ARC152C	Building Construction and Materials – II	4	100	50	50	4
PC	C	ARC153C	Architectural Drawing – II	4	100	100	--	4
PC	C	ARC154C	Humanities and History of Architecture – II	3	75	75	--	3
AE	C	ARC155C	Theory of Structures – II	2	50	50	--	2
SEC	C	ARC156C	Arts and Graphics – II: Computer Aided	2	50	--	50	2
SEC	F	ARC158F	Environmental Studies and Climate Change	2	50	50	--	2
PC	C	ARC159C	Workshop and Model Making	2	50	--	50	2
			TOTAL	26	650	325	325	26

Semester 3								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC201C	Architectural Design – III (Manner of Masters)	7	175	--	175	7
AE	C	ARC202C	Building Construction and Materials - III	4	100	50	50	4
PC	C	ARC204C	Humanities and History of Architecture – III	4	100	100	--	4
AE	C	ARC205C	Theory of Structures – III	2	50	50	--	2
AE	C	ARC210C	Building Sciences	4	100	100	--	4
PC	C	ARC211C	Measured Drawing	3	75	--	75	3
AE	C	ARC212C	Surveying and Levelling	2	50	50	--	2
			TOTAL	26	650	350	300	26
STUDY TOUR								
Semester 4								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC251C	Architectural Design – IV (Repetitive Unit)	8	200	--	200	8
AE	C	ARC252C	Building Construction and Materials - IV	4	100	50	50	4
PC	C	ARC254C	Humanities and History of Architecture – IV	4	100	100	--	4
AE	C	ARC255C	Theory of Structures – IV	2	50	50	--	2
AE	C	ARC263C	Building Services – I (Civil)	2	50	50	--	2
PC	C	ARC264C	Site Planning and Landscape	4	100	50	50	4
OE	OE	ARC265O	Open Elective – I / MOOCs*	2	50	--	50	2
			TOTAL	26	650	300	350	26

Semester 5								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC301C	Architectural Design – V (Long-Span Structure)	8	200	--	200	8
AE	C	ARC302C	Building Construction and Materials - V	4	100	50	50	4
AE	C	ARC305C	Theory of Structures – V	2	50	50	--	2
AE	C	ARC313C	Building Services – II (Mechanical)	3	75	75	--	3
OE	OE	ARC315O	Open Elective – II / MOOCs*	2	50	--	50	2
PE	E	ARC316E	Discipline Centric Elective – I / MOOCs*	3	75	--	75	3
PC	C	ARC317C	Interior Design	4	100	50	50	4
			TOTAL	26	650	225	425	26
STUDY TOUR								
Semester 6								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC351C	Architectural Design – VI (Housing/Hotel/Hospital)	9	225	--	225	9
AE	C	ARC352C	Building Construction and Materials - VI	4	100	50	50	4
AE	C	ARC355C	Theory of Structures – VI	2	50	50	--	2
AE	C	ARC363C	Building Services – III (Electrical)	3	75	75	--	3
PE	E	ARC366E	Discipline Centric Elective – II / MOOCs*	3	75	--	75	3
PC	C	ARC368C	Estimation, Costing and Valuation	3	75	75	--	3
SEC	C	ARC369C	Working Drawing	2	50	--	50	2
			TOTAL	26	650	250	400	26

Semester 7								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC401C	Architectural Design – VII (Adaptive Re-use)	9	225	--	225	9
AE	C	ARC402C	Building Construction and Materials - VII	4	100	50	50	4
OE	OE	ARC415O	Open Elective – III / MOOCs*	2	50	--	50	2
PE	E	ARC416E	Discipline Centric Elective – III / MOOCs*	3	75	--	75	3
PC	C	ARC420C	Town Planning & Settlement Study	2	50	50	--	2
PEC	C	ARC421C	Building Economics and Project Management	3	75	75	--	3
PEC	C	ARC422C	Building Bye-laws, Universal Design and Inclusive Design	3	75	75	--	3
			TOTAL	26	650	400	400	26
Semester 8								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PEC	C	ARC473C	Architectural Internship / Practical Training Seminar	26	650	--	650	--
			TOTAL	26	650	--	650	26

Semester 9								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC501C	Architectural Design – VIII (Urban Design)	12	300	--	300	12
OE	OE	ARC515O	Open Elective – IV / MOOCs*	2	50	--	50	2
PE	E	ARC516E	Discipline Centric Elective – IV / MOOCs*	3	75	--	75	3
PE	E	ARC524F	Research Methodology	2	50	50	--	2
PEC	C	ARC525C	Dissertation - Thesis Preparatory	3	75	--	75	3
PC	C	ARC526C	Climate Change and Disaster Management	2	50	50	--	2
SEC	C	ARC527C	Building Information Modelling	2	50	--	50	2
			TOTAL	26	650	100	550	26
Semester 10								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC551C	Architectural Design – IX (Thesis)	24	600	--	600	20
PEC	C	ARC578C	Professional Practice	2	50	50	--	2
			TOTAL	26	650	50	600	26

Semester 1								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC101C	Architectural Design – I	7	175	--	175	7

COURSE CONTENT:

- Element & Principles of Design: Explorations in elements and principles, explorations in form, studies in 2D & 3D compositions, transformation of a cube, study in volumes, study of gestalt and figure-ground relationship.
- Developing a vocabulary of visual practices and visual field.
- Abstraction in art: exercises in abstraction.
- Anthropometry: Understanding the human body in space.
- 9 Square Grid Exercise: framing space, thinking place.
- Exposure to architecture, Exposure to architects and their works: Group presentations

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Analyze fundamental elements and principles of design and apply them in architectural composition, enabling them to synthesize concepts like balance, rhythm, proportion, and hierarchy in both 2D and 3D architectural compositions.
- Demonstrate an understanding of manipulating shapes, volumes, and masses in architectural design, facilitating their ability to transform basic geometric forms, such as a cube, into complex architectural compositions.
- Develop a comprehensive vocabulary of visual practices and terminology essential for effective communication in architectural design.
- Understand anthropometry and its significance in designing spaces that accommodate human scale and movement.
- Frame space and cultivate critical thinking skills through the 9 Square Grid Exercise, a fundamental exercise in architectural design.

REFRENCES:

1) Francis DK Ching: Form, Space & Order
2) Anthony Di Mari & Nora Yoo: Operative Design – A Catalogue of Spatial Verbs
3) Anthony Di Mari: Conditional Design - An Introduction to Elemental Architecture
4) Ernst Neufert: Architect's Data
5) Rob Krier: Architectural Composition

Semester 1								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC102C	Building Construction and Materials - I	4	100	50	50	4

COURSE CONTENT:

- Building Construction: Elements of buildings -Substructure/ Superstructure
- Introduction to building construction, understanding building components (Foundation, plinth, wall, sill, lintel, roof, doors, windows, ventilators, staircases, sunshades etc.) along with the building materials.
- Paradigms: load bearing structures, frame structures
- Building construction drawing practices and conventions.
- Different types of Brick and Stone Masonry.
- Drawings related to brick masonry and stone masonry.
- Introduction to Building Materials Sand, Clay, Stone, Brick, Lime, Metal, Glass, etc.).
- Source of the material, classification, tests and various grades available and their uses, physical and chemical properties. Introduction to ferrous and non-ferrous metals-their properties, types and application in building components.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Identify and comprehend the various elements of buildings, including substructure and superstructure components.
- Acquire knowledge of building materials such as foundation, plinth, walls, lintels, roofs, doors, windows, and others, along with their properties and uses.
- Differentiate between load-bearing structures and frame structures, understand their design principles, and apply them in building construction.
- Explore different types of brick and stone masonry techniques, including their construction processes, applications, and structural considerations.
- Study various building materials such as sand, clay, stone, brick, lime, metal, and glass, comprehending their sources, classifications, physical and chemical properties, and suitability for construction purposes.
- Understand the selection criteria for building materials, considering factors such as technological suitability, aesthetic appeal, socio-cultural relevance, socio-economic feasibility, and ecological sustainability (green materials).

REFERENCES:

1) Willian Bar McKay: Building Construction
2) Robin Barry: The Construction of Buildings
3) Roy Chudley: Building Construction Handbook
4) Sushil Kumar: Building Construction

Semester 1								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC103C	Architectural Drawing – I	4	100	100	--	4

COURSE CONTENT:

- Studio work culture, pencils, instruments, table, etc
- Drawing formats, guidelines, etc.
- Line weight and Line intensity exercises
- Grids
- Lettering
- Measurements, scales & units
- Measured drawing of an object/structure: exercise in taking measurements, drafting, dimensioning and labelling.
- Introduction to Projections: Concept, Principle and Methods of Projections
- Orthographic Projections of Point, Line and Plane

LERANING OUTCOMES:

After successful completion of this course, students shall be able to;

- Recognize the importance of studio work culture, including collaboration, communication, and professionalism. They will become familiar with various tools such as pencils, drafting instruments, and drafting table setup for effective architectural drafting.
- Develop skills in line weight, intensity, and grid exercises to convey depth and hierarchy in architectural drawings. They will also appreciate the importance of annotation for conveying crucial information in architectural documentation.
- Proficient in measurements, scales, and units used in architectural drawings.
- Understand the concept, principles, and methods of projections in architectural representation. They will also grasp orthographic projections of Point, Line, and Plane.

REFERENCES:

1) Francis DK Ching: Architectural Graphics
2) N. D. Bhatt: Engineering Drawing

Semester 1								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC104C	Humanities and History of Architecture – I	4	100	100	--	4

COURSE CONTENT:

- Chronology: Overview of World history
- Prehistory, Palaeolithic and Neolithic Cultures
- Burzahom archaeological site
- River Valley Civilizations: Indus Valley, Mesopotamia, Nile valley, Chinese civilization
- Vernacular & Subaltern architecture
- Style – Order - Tradition

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Acquire an introduction to the concepts of culture, society, and sociology, establishing a foundational understanding of how human societies are structured and function.
- Comprehend the development of human culture over time, including the evolution of cultural practices, beliefs, and traditions, as well as the tangible and intangible products of culture such as art, architecture, literature, and religion.
- Introduced to various theories of art, including formalism, expressionism, and structuralism, among others, enabling them to critically analyze and interpret works of art and architecture within their cultural and historical contexts.
- Understand the influence of socio-cultural factors such as politics, religion, economics, and technology on architectural design and urban development, gaining insights into the relationship between architecture and society.
- Overview of world history, including major historical periods, events, and civilizations, providing context for understanding the development of architecture across different geographical regions and time periods.
- Study prehistoric cultures such as the Palaeolithic and Neolithic periods, including their lifestyles, social organization, and architectural achievements, such as the Burzahom archaeological site.
- Examine the architecture and urban planning of river valley civilizations such as the Indus Valley, Mesopotamia, Nile Valley, and China, gaining insights into their architectural achievements, technological innovations, and cultural significance

REFERENCES:

1) Sir Banister Fletcher: A History of Architecture
2) Francis DK Ching & V. Prakash: A Global History of Architecture

Semester 1								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC105C	Theory of Structures – I	2	50	50	--	2

COURSE CONTENT:

- Physical properties of basic building materials
- Mechanical properties of building materials
- Characteristics and strength of natural and manmade building materials like stone, clay,brick, cement and aggregate.
- Introduction of forces, composition, resolution, moments and couples, Resultant of forces, Lami's theorem, principle of moments, Vargion's theorem. Principle of equilibrium. Simple problems. Concurrent and non-concurrent co-planar force systems,resultant and equilibrate analytical and graphical solutions
- Simple stresses and strains, elasticity. Stress, strain, types of stresses, elastic limit, modulus of elasticity, composite sections. Stresses due to change in temperature. Elasticconstants, linear strain, lateral strain, Poisson's ratio, volumetric strain, relation between E, N, and K
- Analysis of trusses and frames
- Introduction to trusses, Elements of truss, Assumptions for truss analysis, structuralDeterminacy, methods of analysis of trusses.

TESTS:

1) Compression test on Bricks and Solid Blocks.
2) Water absorption test on Bricks and pressed tiles.
3) Flexure test on Tiles.
4) Fineness test of cement and other mineral admixtures
5) Determination of bulking characteristics of the given sand sample.
6) Study of UTM, Torsion testing machine, Hardness testing Machine, Compression testingMachine etc. understanding operation and application.
7) Demonstration of Strain gauges and Strain indicators
8) Study of Strain Recording Instruments.

REFERENCES:

1) Strength of Materials by Dr. R.K. Bansal
2) Strength of Materials by R.S. Khurmi
3) Engineering Mechanics by R.S. Khurmi
4) Structure II by Bhavikutti.

Semester 1								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC106C	Arts and Graphics – I	3	75	--	75	3

COURSE CONTENT:

- Introduction to art, graphics and visual communication.
- Drawing as representation and drawing as exploration.
- Freehand Sketching
- Rendering and shading in pencil, pen and ink.
- Theory of Colour: Goethe, Newton and Wittgenstein on Colour
- Monochrome and coloured compositions
- Architectural Rendering
- Abstraction in art

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Demonstrate the ability to communicate architectural ideas effectively through visual media.
- Utilize various tools such as pencil, colors, pen, and ink to add depth and realism to their architectural drawings.
- Analyze the psychological and cultural significance of color in architectural representation.
- Create monochrome and colored compositions, enhancing their skills in composition and visual communication while exploring the expressive potential of color in architectural design.
- Appreciate traditional craftsmanship and its potential influence on contemporary architectural practice, fostering cultural sensitivity and cross-disciplinary insights.

REFERENCES:

1) Arthur L. Guptill: Rendering in Pen and Ink
2) Francis DK Ching: Architectural Graphics

Semester 1								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	F	ARC107F	Communication Skills	2	50	50	--	2

COURSE CONTENT:

- Understanding the Basics of Communication Skills: Listening, Speaking, Reading & Writing, Scope and Importance.
- Vocabulary Building & Writing: Word-formation, Synonyms, Antonyms, Homonyms, One- word Substitutes, Idioms and Phrases.
- Speaking, Countering Stage-fright and Related Barriers to Communication.
- Reading and Comprehension: Two lessons to be identified by the department.
- Soft Skills: Interpersonal Communication; Verbal & Non-verbal, Persuasion, Negotiation.
- Communication and presentation using various media.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Demonstrate proficiency in the basics of communication skills, including listening, speaking, reading, and writing, with a deep understanding of their scope and importance in the field of architecture. This will enable students to effectively convey ideas, collaborate with team members, and engage with clients and stakeholders.
- Improve reading comprehension skills through the analysis of selected lessons or texts, enabling them to extract relevant information, understand complex ideas, and critically evaluate architectural literature and discourse.
- Develop soft skills such as interpersonal communication, verbal and non-verbal communication, persuasion, and negotiation. This will equip students with the ability to effectively communicate and collaborate with diverse stakeholders in architectural projects.
- Leverage digital tools and platforms to create compelling visual and verbal narratives for architectural projects, proposals, and presentations.
- Effectively communicate the design intent, concepts, and details of architectural projects to diverse audiences, ensuring clear understanding and alignment among stakeholders.

REFERENCES:

1) Benny, J. (2005). Environmental Studies.
2) Bharucha, E. (2005). Text book of environmental studies for undergraduate courses.
3) Kaushik, A. and Kaushik, C. P. (2010). Basics of Environment and Ecology.

Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC151C	Architectural Design – II	7	175	--	175	7

COURSE CONTENT:

- Understanding of definite, enclosed spaces.
- Enclosure as architecture: studying basic enclosed configurations in everyday life.
- Inside – Outside: Understanding the relations between interior and exterior, buildingand the site
- Function and utility: Architecture as a diagram (flowcharts, bubble diagrams, etc.).
- Form and structure: Architecture as an object.
- Introduction to small scale built-form typologies like living rooms, bus stops, kiosks, etc.
- Studio exercise with emphasis on studying and designing interior layouts.
- Studio exercise with emphasis on studying and conceiving the form.
- One small design exercise as a time-problem of a limited duration

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Analyze definite and enclosed spaces, enabling them to design architectural spaces that fulfil specific functions and requirements.
- Evaluate the interplay between interior and exterior spaces, as well as the relationship between buildings and their sites, facilitating the creation of harmonious and contextually sensitive architectural solutions.
- Explore diverse architectural contexts and small design challenges, developing their ability to adapt to various design scenarios.
- Experiment with different formal expressions and design languages, encouraging creativity and innovation in architectural design.
- Able to complete a small design exercise within a limited time frame, simulating real-world architectural practice and fostering skills in time management, decision-making, and problem-solving.

REFRENCES:

1) Francis DK Ching: Form, Space & Order
2) Anthony Di Mari & Nora Yoo: Operative Design – A Catalogue of Spatial Verbs
3) Anthony Di Mari: Conditional Design - An Introduction to Elemental Architecture
4) Ernst Neufert: Architect's Data
5) Rob Krier: Architectural Composition

Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC152C	Building Construction and Materials – II	4	100	50	50	4

COURSE CONTENT:

- Foundations: Definitions, Purpose of foundation, types of foundations.
- Shallow & Deep foundations and their types.
- Selection criteria for foundation, based on soil conditions, physical properties and behavior of various types of soil, bearing capacity, methods of site exploration andtesting of soil.
- Strip foundation, isolated footing, combined footing, strap foundation, grillage foundation, raft, etc.
- Pile foundation, Caissons, etc.
- Doors and Fenestrations: Access and Ventilation.
- Study of Doors and Windows in Timber: classification and types.
- Doors: Paneled, Ledged and Battened, Ledged-Braced & Battened, Framed-Ledged-Braced & Battened, Flush, etc.
- Casement Windows.
- Joinery and construction details of Timber doors and Windows.
- Study of Timber as a building material: Types, seasoning, storage, preservation, defects,decay, etc.
- Manufactured and Finished timber products: block boards, fiberboards, ply wood,veneers, etc.
- Timber joinery: Different types of joints in timber: Tongue and grove joint, tenon and mortise joint, lap joint, dovetail joint, finger joint, etc. and their use in different contexts.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Demonstrate a comprehensive understanding of foundations, enabling them to make informed decisions in selecting suitable foundation systems for different architectural projects.
- Comprehend doors and fenestrations as elements of access and ventilation in architectural design, facilitating their ability to integrate these elements effectively into their designs.
- Introduced to timber as a building material and joinery techniques, empowering them to incorporate timber joinery into architectural designs with structural integrity and aesthetic appeal.
- Understand masonry arches, including the resolution of forces in an arch and the classification of arches based on their geometrical shape and centering, enabling them to integrate arches into architectural designs while considering their historical, cultural, and structural significance.

REFERENCES:

1) Willian Bar McKay: Building Construction
2) Robin Barry: The Construction of Buildings
3) Roy Chudley: Building Construction Handbook
4) Sushil Kumar: Building Construction

Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC153C	Architectural Drawing – II	4	100	100	--	4

COURSE CONTENT:

- Axonometric and Oblique Projections of Solids in different positions
- Section of Solids and development of Surfaces
- Sections of solids such as prisms, pyramids, cylinders, cones and spheres, etc., Development of surfaces of solids, Intersection of surfaces.
- Basics of perspective drawings: Anatomy of perspective: Station point, Eye level, Cone ofvision, Picture plane, Horizon line, Ground line, Vanishing points
- Types of perspectives: One-point, Two-point

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Creating axonometric and oblique projections of solids in various positions, enabling them to accurately represent three-dimensional objects from different perspectives and orientations.
- Synthesize the ability to create sectional views of solids such as prisms, pyramids, cylinders, cones, and spheres, along with understanding the intersection of surfaces, facilitating the visualization and communication of complex spatial configurations.
- Apply the skill of representing objects and their components accurately in two-dimensional drawings by projecting them onto different planes in orthographic projections of points, lines, and planes.
- Grasp the basics of perspective drawings, providing them with the foundation to create realistic and immersive representations of architectural spaces.
- Proficiency in different types of perspectives, including one-point and two-point perspectives, empowering them to choose appropriate drawing techniques to convey spatial depth and realism in architectural renderings and presentations.

REFERENCES:

1) Francis DK Ching: Architectural Graphics
2) Engineering Drawing by B.V.R. Gupta
3) N. D. Bhatt: Engineering Drawing

Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC154C	Humanities and History of Architecture – II	3	75	75	--	3

COURSE CONTENT:

- Classical Period: Greek and Roman Architecture
- Origins of Temple Architecture: North & South India
- Classification of Temple Architecture
- Difference & Continuity with Greece and Rome
- Jain & Buddhist Architecture: Typologies
- Ancient Architecture of Hinduism & Buddhism in Kashmir: Parihaspora, Awantipora,Martand, etc.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Comprehend Greek and Roman architecture during the Classical Period, enabling them to analyze its architectural features, historical context, and cultural significance.
- Explore the origins of temple architecture in North and South India, gaining insights into the historical development, cultural significance, and architectural features of Indian temple complexes.
- Classify temple architecture, including the study of different typologies, styles, and regional variations, empowering them to identify and analyze various temple structures within the Indian architectural context.
- Analyze the architectural characteristics, historical contexts, and cultural significance of these sacred complexes within the broader framework of Indian architectural history and religious practices in Kashmir, fostering a deeper understanding of the interplay between architecture, history, and culture.

REFERENCES:

1) Sir Banister Fletcher: A History of Architecture
2) Francis DK Ching & V. Prakash: A Global History of Architecture
3) Indian Architecture (Buddhist Hindu) Vol. 1 by P. Brown
3) The Architecture of India, Buddhist & Hindu by S. Grover

Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC155C	Theory of Structures – II	2	50	50	--	2

COURSE CONTENT:

- Geometric properties of sections: Centre of gravity, Moment of inertia and sectionmodulus for various structural shapes.
- Beams: Types & Properties, Types of beams and their behaviour, types of supports andreactions, bending moment and shear forces; simply supported, cantilever and overhanging beams, relation between bending moment and shear force.
- Theory of Simple Bending: Theory of simple bending and assumptions. Flexural formula. Determination of different types of stresses induced in beams and shafts due to bending and twisting moments respectively.
- Bending and Shear Stresses: Bending stresses and Shearing stresses in beams, distribution of shear stress over different sections like, rectangular, circular, triangular, Iand T-sections.
- Forces in Arches: Determination of horizontal thrust, radial shear & normal force, axial thrust, bending moment & shear force for three-hinged arch. Structural concepts in post& lintel, arch, dome, & vault construction. Concept of behaviour of heterogeneous materials in direct force and bending.

TESTS:

1) Tension test on mild steel and deformed steel bars.
2) Deflection test on Simply Supported / cantilever Beams of (a) wood and (b) steel to find Young's modulus.
3) Torsion test on mild steel bar to determine the Modulus of Rigid
4) Determination of the fineness of cement (Blains Permeability apparatus).
5) Determination of normal consistency of cement by Vicat's Apparatus.
6) Initial and final setting time of cement with Vicat's Apparatus.
7) Soundness test on cement by Autoclave method.

REFERENCES:

1) Strength of Materials by Dr. R.K. Bansal
2) Strength of Materials by R.S. Khurmi
3) Engineering Mechanics by R.S. Khurmi
4) Structure II by Bhavikutti.

Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
SEC	C	ARC156C	Arts and Graphics – II: Computer Aided	2	50	--	50	2

COURSE CONTENT:

- Architectural Drawings in AutoCAD, commands, Keyboard shortcuts, etc.
- Standard dimensioning, formatting, layout, etc. in AutoCAD.
- Multi-media presentation, architectural photography, Audio-visual projection, graphics appropriate for illustration of reports and as accompaniments for seminars.
- Softwares: Photoshop, Sketchup, InDesign, Illustrator, etc.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Demonstrate proficiency in operating AutoCAD software, including familiarity with the user interface, navigation tools, drawing commands, and editing functions.
- Demonstrate the ability to create visually engaging and professional architectural presentations for various purposes such as project proposals, design reviews, and presentations.
- Acquire familiarity with additional software tools such as Photoshop, SketchUp, InDesign, and Illustrator, complementing the Microsoft Office suite to further enhance the quality and versatility of architectural presentations. This will enable students to create professional-grade graphics, renderings, layouts, and illustrations.

REFERENCES:

1) Arthur L. Guptill: Rendering in Pen and Ink
2) Francis DK Ching: Architectural Graphics
3) Bark, S. (2012). An Introduction to Adobe Photoshop

Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
SEC	F	ARC158F	Environmental Studies and Climate Change	2	50	50	--	2

COURSE CONTENT:

- Overview of environmental science disciplines relevant to architecture
- Systems and processes affecting the built environment
- Causes and consequences of climate change on the natural environment and human societies
- Principles of sustainable design in architecture: passive design, energy efficiency, and renewable energy integration
- Carbon emissions and footprints
- Strategies for reducing energy consumption, water usage, and material waste in building design and construction
- Integration of renewable energy systems: solar photovoltaics, wind turbines, geothermal heating and cooling
- Overview of climate change policy frameworks at the local, national, and international levels
- Habitats: sustainable and unsustainable

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Identify and classify environmental science disciplines pertinent to architecture, encompassing ecology, climatology, geology, and hydrology, demonstrating comprehension through analysis and categorization.
- Analyze environmental systems and processes impacting the built environment, discerning causal relationships and predicting outcomes through evaluation and synthesis.
-
- Apply principles of sustainable design in architecture, including passive design strategies, energy efficiency techniques, and the integration of renewable energy sources, demonstrating proficiency through application and experimentation.
- Implement renewable energy systems such as solar photovoltaics, wind turbines, and geothermal heating and cooling, utilizing technical expertise to integrate these systems into architectural designs effectively.
- Evaluate climate change policy frameworks at various scales, from local to international levels, demonstrating proficiency in analysis and interpretation to identify opportunities for advocacy and action.

REFERENCES:

1) Benny, J. (2005). Environmental Studies.
2) Bharucha, E. (2005). Text book of environmental studies for undergraduate courses.
3) Kaushik, A. and Kaushik, C. P. (2010). Basics of Environment and Ecology.

Semester 2								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC159C	Workshop and Model Making	2	50	--	50	2

COURSE CONTENT:

- Wooden Joinery: various joinery details to be learned in workshop
- Smithy workshop: various types of welds and steel joints to be learned in workshop.
- Need for architectural models. Role of scale-models in design. General practices in model making. Types of models: block, detailed, construction & interior models.
- Simple exercises in cutting, finishing and joinery with simple blocks, composition of basic geometrical forms.
- Various materials and tools to be used in model making. Use of materials, viz. paper, mount board, cardboard, plastic sheets and acrylic sheets. Development of the skill to use the tools with precision to obtain desired results in model making.
- Use of materials viz. clay, Plaster of Paris, etc.
- Construction of detailed building models
- Executing models for parts of buildings
- Sequence of various stages and involved operations i.e., preparation of base, layout cutting, joining, fixing and finishing of various components.
- Final finishing with color, texture, landscaping and human figures
- Site models including contours, etc.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Demonstrate the ability to construct structurally sound and aesthetically pleasing wooden assemblies in architectural projects, utilizing various joinery techniques.
- Integrate metal elements and structures effectively in architectural design and fabrication, applying principles of structural integrity and aesthetic harmony.
- Explore innovative and expressive approaches to design and fabrication, considering functional, aesthetic, and contextual considerations, fostering creativity and experimentation.
- Gain practical experience in various model making techniques, including cutting, shaping, assembling, and detailing architectural models using a variety of materials such as paper, cardboard, foam board, wood, and plastic.
- Develop a deeper understanding of scale and proportion in architecture through physical model making exercises. They will learn how to translate design concepts from two-dimensional drawings into three-dimensional models accurately representing spatial relationships and design intent.

Semester 3								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC201C	Architectural Design – III (Manner of Masters)	7	175	--	175	7

COURSE CONTENT:

- Major exponents of Architectural styles: master architects
- Seminar – The presentation on a particular modern or post-modern style of architecture and discussing the style through two of the works of a pioneer architect for that style. (2 weeks duration)
- **Design Project based on inferences drawn from works of a chosen master architect (Residence).** (12 weeks duration)
- Site analysis at the beginning of design problem to develop sensitivity to existing site conditions and context and help students evolve design directives to guide the design process. (1 week duration)
- One short time problem. (1 week duration)
  Understanding indoor and outdoor spaces created by built forms.
- Major Debates in Architectural Theory
- Architecture and Capitalism

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Demonstrate an understanding of the meaning of cultural and physical context of the built environment and apply techniques for analyzing such contexts.
- Analyze and synthesize the elements/principles/languages used by various master architects in their works, enabling them to critically evaluate and apply these principles in their own designs.
- Identify and evaluate various factors of the context that influence the design of built environments, integrating these considerations into their design process.
- Understand the parameters of Site Analysis and apply these for the given project site, demonstrating proficiency in analyzing site characteristics and constraints.
- Synthesize zoning principles within the specified site and prepare architectural designs of buildings for specific functions, demonstrating their ability to translate conceptual ideas into practical design solutions.

REFERENCES:

Semester 3								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC202C	Building Construction and Materials - III	4	100	20	50	4

COURSE CONTENT:

- Concrete: Composition, properties of PCC and RCC, methods of concrete construction – various stages involved like – batching, mixing, transporting, compacting, curing, shuttering. Also, study of collared concrete, light weight concrete precast concrete, quality control of concrete.
- Concrete Technology
    - Concrete: Past, Present and Future.
    - Concrete Admixtures.
    - Concreting under extreme conditions.
    - Ready Mix Concrete.
    - Application specific varieties of concrete.
    - Quality Control in Concrete Construction.
    - Defects and repairs in concrete.
- Form work and shuttering for different types of RCC elements, trench timbering, scaffolding, shoring and underpinning.
- Precast, pre-stressed, Pre-Tensioning and Post Tensioning of concrete members.
- Advantages of Pre-stressing over RCC.
- Study of masonry arches, resolution of forces in an arch.
- Buttresses & Retaining walls: Details of construction of buttresses and retaining walls.
- Classification of arches based on their geometrical shape and centering. Comparison with their cultural and historical types.
- Types of other Roofs: Jack arch roof, Thatch roofing, Filler slab roofing with various filler material, Clay/micro-concrete tiled roofing, etc.
- Various uses of bio mass and techniques involved in the same.
- Non - Conventional techniques in general but conventional for a specific region developed in response to the locally available materials and construction techniques in response to the climate of a region in an urban or rural set up may be taken for study.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Comprehend RCC as a building material and evaluate its application in building construction, demonstrating a thorough understanding of its properties, advantages, and limitations.
- Analyze the construction of various types of roofs and synthesize their application in architectural projects, enabling them to select appropriate roof types based on structural and design requirements.
- Classify staircases based on material and design, applying their knowledge to construct staircases effectively. They will demonstrate proficiency in understanding the structural and design considerations involved in staircase construction

REFERENCES:

1) Willian Bar McKay: Building Construction
2) Robin Barry: The Construction of Buildings
3) Roy Chudley: Building Construction Handbook
4) Sushil Kumar: Building Construction
5) Frederick S. Merritt, Jonathan T. Ricketts - Building Design and Construction Handbook
6) Madan Mehta_ Walter Scarborough_ Diane Armpriest - Building construction _ principles, materials, and systems

Semester 3								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC204C	Humanities and History of Architecture – III	4	100	100	--	4

COURSE CONTENT:

- Continuation and evolution of post-classical styles of European architecture - Early Christian, Byzantine, Romanesque, Gothic (Medieval).
- Architecture of Islamic Civilizations:
- Early Islamic
    - Mosque: Beginnings
    - Ummayyad & Abbassid periods
    - Seljuk, Mamluk, Ilkhanid periods
    - Early Safavid
    - Early Ottoman
- Architecture of Sultanate period in Indian Sub-continent.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Analyze architectural elements, forms, development trends, construction techniques, materials, and technologies used in the built environment during the Islamic Period.
- Evaluate the historical and cultural significance of these architectural aspects, demonstrating a comprehensive understanding of the architectural achievements of this period.
- Examine transformation patterns in architecture during various kingdoms and time periods.
- Synthesize the contributing factors for the design development of different styles, enabling them to critically evaluate the socio-cultural, political, and technological influences on architectural evolution throughout history.

REFERENCES:

1) Sir Banister Fletcher: A History of Architecture
2) Francis DK Ching & V. Prakash: A Global History of Architecture

Semester 3								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC205C	Theory of Structures – III	2	50	50	--	2

COURSE CONTENT:

- Torsion – Concept of twisting of beams, torsion equation , torsional stresses in simple sections;
- Deflection in beams - Macaulay's Method – Moment area method ;
- Definitions of Columns & Struts – Long, Medium & Short columns – Effective Length – Slenderness Ratio – Critical load - Safe load — Different end conditions — Euler's formula for critical load — Assumptions and limitations — Strength of columns.
- Consistent deformation method – fixed and propped cantilever ;
- Analysis of continuous beams using Three moment theorem; Moment distribution method in Beams and Frames

Text Books

1) R Junarkar S. B. and Shah S. J., Mechanics of Structures (Vol. I), 30/e, Charotar Publishing House Pvt. Ltd., New Delhi, 2012
2) Junnarkar S. B. and H. J. Shah, Mechanics of Structures, Vol – II, 23/e, Charotar Publishing House, 2013.
3) Punmia B. C., A. K. Jain and A. K Jain, Theory of Structures (SMTS- II), Laxmi Publications Pvt. Ltd., 2004.

References Books:

1) Ramamrutham S. And R. Narayan, Theory of Structures, Dhanpat Rai Publishing Co.,2012
2) R.K Bansal., Strength of Materials, Lakshmi Publications Pvt Ltd
3) M.M. Ratwani & V.N. Vazirani, Analysis of Structures, Vol. 1, Khanna Publishers – Delhi, 1987.
4) Timoshenko, S.P. and D.H. Young, Elements of Strength of Materials, Fifth edition, East West Press, 1993.
5) A.R. Jain and B.K.Jain, Theory and analysis of structures, Vol. 1, Nemchand and Bros, Roorkee, 1987.
6) R.K. Rajput "Strength of Materials", S.Chand & Company Ltd., New Delhi 1996.

Semester 3								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC210C	Building Sciences	4	100	100	--	4

COURSE CONTENT:

- Introduction to climatology.
- Climatic Elements and their representation.
- Human Comfort and Thermal Comfort,
- Sun-Earth Relationship
- Natural Ventilation and Air Movement.
- Passive Design Strategies
- Daylighting & Illumination
- Acoustical / Sonic Environment and acoustical comfort.
- Echo, Flutter, Noise, Reverberation time.
- Acoustic insulation, Resonators, etc.
- Acoustic design strategies for Auditoriums, Conference Halls, etc.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Classify elements of climate and demonstrate an understanding of related terminology. They will analyze the relationship of climate with architecture, evaluating its impact on design decisions.
- Interpret various concepts of climate analysis and apply them in architectural design. They will synthesize the use of climate analysis techniques to inform design solutions.
- Assess parameters of human thermal comfort and formulate strategies for its achievement in the built environment.
- Evaluate the effectiveness of different design approaches in enhancing thermal comfort.
- Understand the building sciences of lighting and acoustics, identifying related terminology and principles. They will analyze the role of lighting and acoustics in architectural design.
- Summarize common acoustical defects in halls/auditoriums and propose ways to avoid them. They will evaluate the effectiveness of design interventions in mitigating acoustical issues and improving overall sound quality.

REFERENCES:

1) O.H. Koenigsberger: Manual of Tropical Housing and Building
2) M. David Egan: Architectural Acoustics
3) Raj Patel: Architectural Acoustics – A guide to integrated thinking.

Semester 3								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC211C	Measured Drawing	3	75	--	75	3

COURSE CONTENT:

- Methods of documentation
- Measuring and recording measurements on site
- Exercise:
  a) Identify a significant architectural monument of suitable scale
  b) Collect photographs, historical accounts & other relevant architectural information like permission drawings/records etc.
  c) Execute fieldwork and hands-on measurements
  d) Translate measured data into scale drawings
  e) Explain the as-built building constructions, architectural details, and elements
- Create set of computers based measured drawings of identified structure and produce scale model.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Recognize the need for documentation in architectural practice, evaluating its importance in conveying design intent, meeting regulatory requirements, and facilitating communication among project stakeholders.
- Analyze various methods and instruments of documentation, demonstrating an understanding of their applications and limitations.
- Synthesize documented data into a set of CAD drawings, applying appropriate drafting techniques and standards to accurately represent architectural elements and details

Semester 3								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC212C	Surveying and Levelling	2	50	50	--	2

COURSE CONTENT:

- Understand land topography and its connection with surveying and levelling exercises.
- Types of Surveys in practice and overview of various survey techniques and equipment
- Concept of surveying and levelling and its tactical importance for Architecture profession
- Overview and classification of various survey techniques and equipment
- Scaling of survey measurements and errors in surveying
- Concept of trigonometry, traversing and tachometry in surveying
- Chain Surveying: Principles of survey, equipment required selection of station, methods of taking offsets. Booking the field notes, obstacles in chaining, errors in chaining, chaining on sloping ground and reciprocal ranging
- Compass surveying: The prismatic compass, its construction and uses. Other types of compasses. Reduced and whole circle bearing, magnetic declamation, effects of local attraction. Compass traverse and balancing the closing error.
- Plane table surveying: Equipment, methods, advantage and disadvantage, errors, etc
- Theodolite Surveying: Theodolite's temporary and permanent adjustment, measuring of magnetic bearings, horizontal and vertical angles. Theodolite traverse and balancing closing error.
- Tachometric Surveying: General instruments, different systems of tachometric measurements, stadia method, Subtense method
- Levelling: Different types of levels, their temporary and permanent adjustment, levelling staff. Book of the readings and reduction of levels. Errors in levelling. Curvature and refraction reciprocal levelling profile. Levelling cross sections.
- Contouring: Characteristics of contour lines, direct and indirect methods of contouring and interpolation of contours. Interpretation and preparation of contour maps.
- Total Station Survey

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Apply various measurement methods proficiently by employing appropriate tools such as tapes, electronic distance meters, total stations, theodolites, and GPS, to accurately determine distances, angles, and elevations.
- Interpret and execute topographic survey techniques to effectively map natural and man-made features of a site, including contour mapping, spot elevation identification, feature coding, and the creation of comprehensive topographic maps and plans.
- Implement construction layout procedures with precision, translating architectural designs into actionable construction site information by establishing building corners, gridlines, excavation boundaries, and foundation positions.
- Analyze and utilize Global Positioning Systems (GPS) technology, demonstrating understanding of its principles and applications in surveying, including real-time kinematic (RTK) positioning, post-processing methodologies, and integration with Geographic Information Systems (GIS) data.
- Execute fieldwork and practical exercises proficiently, integrating theoretical knowledge with practical application through hands-on experiences such as field surveys, levelling exercises, and site measurements, to solve real-world surveying challenges effectively.

REFERENCES:

1) Nick Dunn: Architectural Modelmaking
2) Will Strange: An Architectural Model

Semester 4								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC251C	Architectural Design – IV (Repetitive Unit)	8	200	--	200	8

COURSE CONTENT:

- One complex design problem which includes simple repetitive types of spaces like schools, hostels, shops and offices. (11 weeks duration)
- Detailed site analysis. (1 week duration)
- Case Studies and Literature Studies. (2 weeks duration)
- Understanding of services.
- Integration with structural feasibility.
- Evolving working solutions for parking.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Demonstrate the ability to provide architectural solutions for simple problems, applying their knowledge of architectural principles, building codes, and design techniques.
- Analyze the architectural design process of multifunctional units, integrating the learning from previous semesters. They will synthesize this understanding to develop comprehensive design solutions that address various functional requirements and user needs.
- Apply the parameters of Site Analysis for the given project site, demonstrating proficiency in evaluating site characteristics, constraints, and opportunities. They will utilize this analysis to inform their design decisions effectively.
- Integrate structural feasibility and incorporate services aspects into their design solutions.
- Demonstrate the ability to consider structural integrity and service requirements while developing architectural designs, ensuring the practicality and functionality of their proposals.

REFERENCES:

Semester 4								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC252C	Building Construction and Materials - IV	4	100	50	50	4

COURSE CONTENT:

- Timber floors: construction techniques, types of timber floors: single, double and triple joist timber floors.
- Types of timber partitions: Single, double, and flushed timber partitions
- Design criteria for provision of Elevators, Escalators, Travellators and Auto walks. Details of construction
- Description of staircases, technical terminology involved, classification of staircases based on shape, material, and its construction details.
- The vertical section through staircases with detailing at various levels technical terminology involved, Different types of staircases-Dog legged, Circular, Open Well, Spiral, Elliptical, etc. Classification, based on materials like wooden, steel and RCC.
- Staircase layout and its construction details, different elements of staircases, etc.
- Design and details of construction of staircases in timber, stone, RCC and steel.
- Hollow and Panel walls: Economy and advantages over solid load bearing walls, practical consideration during construction hollow concrete block construction, different types of partition wall.
- Construction of cavity wall with different thermal and acoustical insulative system.
- Reinforced brick work.
- Types of non-conventional walling techniques: mud walls: adobe, wattle and daub, rammed earth, cob walls, compressed earth blocks, etc.
- Sun dried bricks, stabilized soil blocks, hollow concrete blocks, etc.
- Ferro-cement and similar materials
- Use of precast aesthetical materials: Bricks jaalis, cement jaalis, mouldings etc.
- Alternative non-conventional materials and techniques used for roofing: Bamboo roofing, Composite material, Mangalore tiles, etc.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Synthesize various components of building services and formulate strategies for their integration with architectural design. They will apply these strategies to develop comprehensive architectural solutions that incorporate functional and sustainable building services.
- Analyze the construction of timber floors and timber partitions and explore various contemporary materials for similar applications. They will evaluate the suitability of different materials based on factors such as durability, sustainability, and aesthetic appeal.
- Understand the design criteria for elevators, autowalks, and escalators, and apply this knowledge to their construction. They will demonstrate proficiency in designing and specifying vertical transportation systems for architectural projects.
- Comprehend the construction of cavity walls and analyze their application and use in architectural design. They will evaluate the benefits and limitations of cavity walls compared to other construction methods, informing their design decisions.
- Explore bamboo as a construction material, evaluating its properties, advantages, and limitations. They will apply this understanding to consider bamboo as a viable option in architectural design, promoting sustainable and innovative construction practices.

REFERENCES:

1) Willian Bar McKay: Building Construction
2) Robin Barry: The Construction of Buildings
3) Roy Chudley: Building Construction Handbook
4) Sushil Kumar: Building Construction
5) Frederick S. Merritt, Jonathan T. Ricketts - Building Design and Construction Handbook
6) Madan Mehta_ Walter Scarborough_ Diane Armpriest - Building construction _ principles, materials, and systems

Semester 4								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC254C	Humanities and History of Architecture – IV	4	100	100	--	4

COURSE CONTENT:

- Architectural typologies of Early Modern Europe - Renaissance, Baroque, Mannerism and Post Renaissance.
- Architecture of Early Modern India
- Mughal Architecture and provincial styles.
- Colonial Architecture in Indian Sub-continent.
- Neo-Classical, Early Modern, Arts and Crafts movement, Art Nouveau
- Modernism in architecture and Industrial revolution.
- Modern architectural theories of Europe and America.
- High modernism and Post-Modern Architecture.
- Modern and Contemporary Architecture in Indian Sub-continent: Critical regionalism and after.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Analyze architectural elements, forms, development trends, construction techniques, materials, and technologies used in the built environment across civilizations.
- Synthesize their understanding to compare and contrast architectural practices across different historical periods and geographical regions, demonstrating a comprehensive grasp of architectural evolution and diversity.

REFERENCES:

1) Sir Banister Fletcher: A History of Architecture
2) Francis DK Ching & V. Prakash: A Global History of Architecture
3) Percy Brown: Indian Architecture

Semester 4								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC255C	Theory of Structures – IV	2	50	50	--	2

COURSE CONTENT:

- Design philosophy of Limit state method - Design of singly reinforced beams under flexure and shear;
- Design of Doubly reinforced beams under flexure and shear;
- Slabs – Classification; Design of One Way slab under flexure and shear; Design of Two way slab under flexure and shear under both conditions of corners free to lift up and corners held down.
- Design of short column subjected to axial loads & combined axial load and uniaxial bending by limit state method; Footings- Types of footing,
- Design of isolated footings-Square and Rectangular shapes subjected to axial compressive load only.
- History of structural design in the pre and post-industrial era

Text Books:

1) S.N. Sinha, Reinforced Concrete Design – Tata McGraw Hill Publishing Co. Ltd.,New Delhi, 1998.
2) Shah, Reinforced Concrete, Vol. 1 and 2 – Charotar Publishing House, Anand, 1998
3) S. Unnikrishnan Pillai and Devados Menon, Reinforced Concrete Design – Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1999.

References Books:

1) P.Dayaratnam, Design of Reinforced Concrete Structures, Oxford and IBH Publishing Co., 1983.
2) C. Sinha and S.K. Roy, Fundamentals of Reinforced Concrete, S.Chand & Co., New Delhi, 1983.
3) Dr. B.C. Punmia, Reinforced Concrete Structures, Vol, 1 & 2 Laxmi publications, Delhi, 1994.
4) IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
5) SP -16 Design Aids for IS 456

Semester 4								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC263C	Building Services – I (Civil)	2	50	50	--	2

COURSE CONTENT:

- Water Supply: Sources of Water supply, Impurities of water and systems of water supply, various kinds of water meters, Water storage tanks, their capacity and location, Calculation of Water consumption, Domestic hot and cold-water supply systems, Size of pipes and their joining details, Connections of different sanitary fittings like ferrule, stopcock, bibcock, etc. Preparation of water-supply drawing of a building of medium complexity.

- Sanitation: Basic principles of sanitation and disposal of waste matter from buildings.

- Dry and Wet Carriage Systems: Sanitary fittings and fixtures – washbasins, bath-tubs, sink, urinals, bidets, flushing cistern, traps, etc.; Various types of joints, manholes and septic tanks; Proper location and ventilation of intercepting chambers and inspection chambers; Drainage systems – separate, combined and partially combined systems; Single stack system; One and two pipe system; Testing of house drains; Gradients used in laying drains and sewers; Self-cleaning and non-scouring velocities for drain pipes; Size of drain pipes and materials used.

- Preparation of plumbing drawing of a building of medium complexity.

- Roads: Hierarchy of roads, cross section of roads; Description and suitability of roads and comparative cost analysis; WBM (water bound macadem) road, tar, bitumen, asphalt and RCC roads; Soil stabilized, brick and stone paving; Drainage – sub drains, culverts, ditches, gutters, drop inlets and catch basins. Preparation of various road sections including above mentioned details.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Analyze water requirements in various types of buildings and evaluate the integration of water supply services in architectural design. They will synthesize this understanding to propose efficient and sustainable water management solutions that meet the needs of occupants while considering environmental factors.
- Understand the functions of various plumbing fittings and fixtures, applying applicable IS Codes.
- Assess the suitability of plumbing components based on design requirements and regulatory standards, ensuring compliance and safety in building installations.
- Develop design skills for water supply and drainage systems in buildings. They will prepare architectural drawings and drainage layouts that demonstrate proficiency in designing efficient and effective plumbing systems.

REFERENCES:

1) Fred Hall, Roger Greeno: Building Services Handbook
2) Christopher A. Howard: An introduction to building services
3) David V Chadderton: Building Services Engineering

Semester 4								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC264C	Site Planning and Landscape	4	100	50	50	4

COURSE CONTENT:

- Definition of plot, site, land and region; Units of measurements.
- Site Analysis process & methods.
- Importance of site analysis – factors involved; Accessibility, size and shape of sites; Climate and topography, infrastructures available, sources of water supply.
- Preparation of site analysis diagram and topographical analysis.
- Site investigation process & checklist; Site property and its usability.
- Lie of the land, contours, watershed, surface drainage, aquecuts and irrigation lands.
- Site development and its environmental impact; Site design: Ability to respond to site.
- The process of site planning; Site planning for light, noise and air; location of activities; systems of circulation; visual form; streets and parking; open spaces and location of utilities and utility systems.
- Site security analysis.
- Introduction to Landscaping: Definition, scope, objectives, design process and profession of landscape architecture in relation to architecture, elements of landscape design and site developments, linkages with nature and built environment.
- The Historic Landscape Patterns: History of the art of garden design of India, China, Persia, Japan, Italy, France and England; Garden design of the modern world; Reading the historic landscape patterns.
- Horticulture-Plant classification and nomenclature, plant identification. Characteristics of various types of plants and their usability, plant selection criteria; Spatial principles of planting design.
- Study of works of major landscape architects and design exercise covering all parts of the above.
- An assignment on Landscape design.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Synthesize knowledge to develop a checklist of desirable factors for better understanding of the site context.
- Evaluate site characteristics and compile a comprehensive checklist that encompasses environmental, social, and cultural considerations, facilitating informed design decisions.
- Analyze various services related to landscape, including irrigation, drainage, and vegetation management.
- Evaluate the role of each service in enhancing the functionality and aesthetics of outdoor spaces, integrating landscape services into architectural design projects effectively.
- Understand the various parameters that control the macro and microclimate of a region. They will analyze factors such as geography, topography, vegetation, and human activities to assess their influence on climate patterns. Applying this understanding, students will propose strategies for climate-responsive design solutions that optimize thermal comfort and environmental performance.

REFERENCES:

1) Kevin Lynch: Site Planning
2) William A. Mann: Landscape Architecture – An Illustrated History in Timelines, Site Plans and Biography
3) Sunil S. Toye: Introduction to Landscape Design
4) Barry Starke, John Ormsbee Simonds: Landscape Architecture – A manual of Environmental Planning and Design
5) Norman K Booth: Foundations of Landscape Architecture – Integrating Form and Space Using the Language of Design

Semester 4								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
OE	OE	ARC265O	Open Elective – I / MOOCs*	2	50	--	50	2

COURSE CONTENT (to be designed and developed by the concerned faculty)

Sample courses:

- Art Appreciation
- Introduction to Islamic Art & Architecture
- Historic Landscapes of Kashmir
- Visual Communication

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Understand the foundational concepts and theories relevant to the chosen elective and analyze real-world case studies and examples to identify the challenges and opportunities.

**1. MOOCs courses shall be approved by the HoD on prior basis.*

2. Any expenditure towards registration fees or examination fees for taking MOOCs courses will be borne by the student himself / herself.

3. Earning of credits by opting MOOCs courses shall be governed by the statutes laid down by the university as notified.

Semester 5								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC301C	Architectural Design – V (Long-Span Structure)	8	200	--	200	8

COURSE CONTENT:

- Seminar – A presentation on architecture for urban commercial, recreation, entertainment activities for large group of people (2 weeks duration).
- **Design Project based on one complex project exploring structural spanning systems for large, covered areas and advanced structural systems and building materials** (12 weeks duration.
- Design problem: Stadium, Auditorium, Concert Hall, Convention center or similar typologies.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Apply knowledge of structural spanning systems and advanced building materials in a design project. They will synthesize this understanding to integrate innovative structural solutions and materials into architectural designs, enhancing structural efficiency and aesthetic appeal.
- Design complex projects such as stadiums, auditoriums, or convention centers. They will synthesize architectural principles, spatial planning, and technical requirements to develop comprehensive design solutions that meet the functional and aesthetic needs of large-scale public facilities.
- Understand challenges in designing large-scale public facilities. They will analyze factors such as site constraints, user requirements, and regulatory considerations to evaluate design solutions that address complex architectural, structural, and logistical challenges.
- Develop presentations on urban commercial, recreation, and entertainment architecture for large groups. They will synthesize architectural concepts, design strategies, and visual communication techniques to create compelling presentations that effectively convey design intent and engage diverse stakeholders.

Semester 5								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC302C	Building Construction and Materials - V	4	100	50	50	4

COURSE CONTENT:

- Introduction to steel construction systems.
- Types of Connections - Bolted joints - arrangement of bolts. Welding -Types of Welding.
- Introduction to steel concrete composite structures - concepts and Theory-Advantages of Composite sections.
- Metal sections, fixtures & fastenings for metal doors, windows, and partitions.
- Adhesives: Market survey and study of various adhesives available for the binding of various types of materials used in building construction.
- UPVC doors, windows, partitions.
- Paints, plastics, glass, Various types of cladding and construction details

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Analyze the properties and characteristics of steel as a building material. They will evaluate its strength, durability, and versatility, demonstrating a comprehensive understanding of steel's suitability for structural applications.
- Identify and comprehend different types of connections in steel structures, including bolted joints and welding. They will assess the structural integrity and efficiency of various connection methods, applying appropriate techniques to ensure safe and reliable structural performance.
- Apply allowable stresses and general specifications in the design of laterally supported steel beams, checking for deflection. They will synthesize structural analysis principles and design criteria to develop sound and efficient steel beam designs that meet safety and performance requirements.
- Understand reinforcement and design details for footings, columns, beams, slabs, and lintels in steel structures. They will evaluate structural loads and design considerations to develop comprehensive and code-compliant steel structural elements that ensure structural stability and durability.

References:

1) Comprehensive Design of Steel Structures, Pumia, A.K Jain, Lakshmi Publications, Delhi 2009.
2) Ramachandra S., "Design of Steel Structures", Standard Book House, Delhi, 2006.
3) Composite Structures of Steel & Concrete: Beams, Slabs, Columns & Frames for buildings, Volume- 1, R.P Johnson,2013.
4) IS 800:2007 General Condition in Steel – Code of practice
5) Johnson R.P., Composite Structures of Steel and Concrete, Blackwell Scientific Publications (Second Edition), UK, 2012.

Semester 5								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC305C	Theory of Structures – V	2	50	50	--	2

COURSE CONTENT:

- Introduction to steel sections – Design of Connection : Riveted, Bolted , Welded
- Design of tension member – plate, single angled member;
- Compression member – single angled strut;
- Introduction to built up column, Design of laterally restrained beams; Design of Column Bases;
- Introduction to timber beam and flitched timber beam; Types
- of Flitched Beam -Design of flitched timber beam;
- Design of timber column - Slenderness Ratio -Built up column

Text Books:

1) A.S.Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee, 1971.
2) Dayaratnam.P, Design of Steel Structures, Oxford and IBH Publishing Co.
3) Gurucharan Singh, Design of Steel Structures, Standard Publishers, New Delhi, 1982.
4) IS 883 – Code of Practice for Design of Structural Timber in Buildings
5) IS 800 – Code of Practice for use of Structural Steel in General Building Construction Tayal, A. K., Engineering Mechanics- Statics and Dynamics, Umesh Publications
6) National Building Code of India, 1983, Part VI, Structural Design.
7) L.S. Negi, Design of Streel Structures – Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
8) S. Ramachandra, Design of Steel Structures - Standard Book House, Delhi, 1984.
9) Design of Steel Structures by N.Subramanian
10) Limit State Design of Steel Structures S.K Duggal

Semester 5								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC313C	Building Services – II (Mechanical)	3	75	75	--	3

COURSE CONTENT:

- Principles of air-conditioning; Psychometric chart, comfort zone; Refrigeration cycle and air cycle; Methods of cooling and heating; Evaporative cooling systems of air-conditioning; Unit air-conditioners and Central air-conditioning plants; Standards and prescribed locations for various parts; Descriptive details of plants and duct layout; Air distribution system – fans, filters, ductwork, outlets, dampers; Natural and artificial ventilation.
- Elevators and Escalators
  Types of lifts, their control and operation; Definition of average lift carrying capacity, rated load, rate speed, RTT, etc.; Details of lift section, machine room, equipment, lift well and lift pit; Design standards for lift lobby, lift car sizes, etc. from building codes; Escalators and conveyors.
- Exercise: Preparation of HVAC drawing of a building of medium complexity.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Analyze the principles of air-conditioning, including the psychometric chart, comfort zone, refrigeration cycle, and air cycle. They will evaluate the relationships between temperature, humidity, and air properties to synthesize effective strategies for indoor climate control.
- Compare and contrast methods of cooling and heating in air-conditioning systems. They will apply knowledge of refrigeration and heating principles to design and optimize HVAC systems for thermal comfort in various building environments.
- Assess the principles and applications of evaporative cooling systems. They will analyze factors such as climate, humidity, and system efficiency to develop effective evaporative cooling solutions for buildings in different geographical regions.
- Evaluate unit air-conditioners and central air-conditioning plants, including standards and prescribed locations. They will apply industry regulations and guidelines to design and install efficient and sustainable air-conditioning systems for buildings.
- Design air distribution systems, including fans, filters, ductwork, outlets, and dampers. They will synthesize principles of airflow dynamics and system efficiency to develop effective ventilation solutions that optimize indoor air quality and comfort.
- Compare and contrast natural and artificial ventilation systems in buildings. They will analyze factors such as building orientation, climate, and occupant comfort to design and implement ventilation strategies that promote energy efficiency and occupant well-being.

References:

Semester 5								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
OE	OE	ARC315O	Open Elective – II / MOOCs*	2	50	--	50	2

COURSE CONTENT (to be designed and developed by the concerned faculty)

Sample courses:

- Art Appreciation
- Introduction to Islamic Art & Architecture
- Historic Landscapes of Kashmir
- Visual Communication

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Understand the foundational concepts and theories relevant to the chosen elective and analyze real-world case studies and examples to identify the challenges and opportunities.

**1. MOOCs courses shall be approved by the HoD on prior basis.*

2. Any expenditure towards registration fees or examination fees for taking MOOCs courses will be borne by the student himself / herself.

3. Earning of credits by opting MOOCs courses shall be governed by the statutes laid down by the university as notified.

Semester 5								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PE	E	ARC316E	Discipline Centric Elective – I / MOOCs*	3	75	--	75	3

COURSE CONTENT:

- To explore allied disciplines which will contribute to the architectural and design training of the student.

Suggestive list:

- Film and Architecture
- Vernacular Architecture
- Rural Habitat
- Furniture Design
- Housing
- Construction Management
- Urban and Regional Planning
- Disaster Management
- Architectural Journalism
- Theatre/Film Set Design
- Marketing Skills
- Building Systems Integration
- Visual Communication
- GIS

- To undergo the coursework/workshop
- To document the process of the course undergone
- To prepare a report/ portfolio of the work done
- To demonstrate the learning's of the course.
- To present the work in a forum.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Recall foundational concepts and theories relevant to the chosen elective within the department's specialization. and analyze real-world case studies and examples to contribute towards knowledge production and identify the challenges and opportunities in the subject.

**1. MOOCs courses shall be approved by the HoD on prior basis.*

2. Any expenditure towards registration fees or examination fees for taking MOOCs courses will be borne by the student himself / herself.

3. Earning of credits by opting MOOCs courses shall be governed by the statutes laid down by the university as notified.

Semester 5								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC317C	Interior Design	4	100	50	50	4

COURSE CONTENT:

- Introduction to interior design: Introduction to various methods of interior space planning and execution including detailed anthropometric studies, materials, finishes and lighting
- Principles of interior design: Colour, illuminators, furniture, furnishings, and accessories
- Anthropometry
- History of modern furniture design.
- Elements of Interior Architecture - Enclosing Elements
- Elements of Interior Architecture - Space Programming
- Exercise: toilet design, office design, kitchen design, restaurant, and showroom.
- Preparation of Flooring Drawings, Wall Elevations, Furniture Layouts and Reflected Ceiling Plans.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Synthesize the principles of interior design, including space planning, execution, anthropometric studies, materials, finishes, and lighting. They will apply this knowledge to analyze spatial requirements and develop functional and aesthetically pleasing interior environments.
- Evaluate color theory, illumination techniques, furniture design, furnishings, and accessories in interior design. They will critique the use of color, lighting, and furniture arrangements to optimize visual appeal and create cohesive interior spaces.
- Examine the history of modern furniture design and key figures, including moulded and modular furniture. They will analyze historical trends and synthesize design influences to inform contemporary interior design practices.
- Analyze the elements of interior architecture, including enclosing elements (walls, ceilings, floors), space programming, functional and spatial requirements. They will integrate architectural principles and apply design concepts to develop interior spaces that meet user needs and enhance human experiences.

References:

1) Time saver standards for interior design and space planning
2) The colour scheme bible: inspirational palettes for designing home interiors
3) Inspired design: the 100 most important designers of the past 100 years
4) Kitchen and bath design: a guide to planning basics
5) Interior detailing: concept to construction (David Kent Ballast)

Semester 6								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC351C	Architectural Design – VI (Housing/Hotel/Hospital)	9	225	--	225	9

COURSE CONTENT:

- One long exercise: low-rise high-density housing/ hotel/ hospital (While designing socio-economic determinants, regulatory and technological alternatives shall be studied in detail).
- Introduction to Issues related to housing shortages, basics of housing finance, incremental housing, sites and services schemes, hotel design and requirements, hospital design and requirements and other considerations to be considered to create a climate responsive and environment friendly design project.
- The students are expected to carry out detailed site analysis, documenting physical features, vegetation, landforms soil characteristics, slope analysis and natural drainage patters. Site planning exercise should depict understanding of vehicular and pedestrian movement patterns, land grading and conservation of ecologically sensitive features.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Analyze design principles for low-rise high-density housing, hotels, and hospitals. They will evaluate spatial configurations, functional requirements, and user needs to synthesize effective design solutions that optimize space utilization and promote occupant well-being.
- Explore socio-economic determinants, regulatory requirements, and technological alternatives in design projects. They will assess the impact of socio-economic factors and apply regulatory standards to develop sustainable and socially responsive design solutions.
- Address housing shortages, housing finance, incremental housing, sites and services schemes, and climate-responsive design. They will analyze site conditions and propose design strategies that address housing affordability, accessibility, and environmental sustainability.
- Develop skills in detailed site analysis, including physical features, vegetation, and soil characteristics. They will synthesize site data to inform design decisions and optimize site utilization while minimizing environmental impact.
- Apply design principles to create innovative and functional design solutions. They will develop presentation and communication skills to effectively convey design concepts and engage stakeholders in the design process.

Semester 6								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC352C	Building Construction and Materials - VI	4	100	50	50	4

COURSE CONTENT:

- Construction of steel structures (Factory shed/long span)
- Steel columns, portal frames
- Multi-storied steel frame structures connection and their components
- Introduction to a wide range of modern building construction systems incorporating the use of metals like steel, aluminum, and composite materials.
- Prefabricated construction of building components
- Details of roof and roof trusses
- North light truss, tubular monitor roof truss
- Steel monitor trusses
- Space frames
- Classification of roofs: (a) Single roofs; flat roofs, lean-to roofs, double lean-to, couple, close couple and collar roofs (b) Double or Purlin Roofs. (c) Trussed rafter roofs (d) Triple or framed roofs (e) Common roof coverings with its laying
- King post and Queen post roof trusses.
- Roofing Material: Study of contemporary roofing materials
- Waterproofing, rainwater gutter details.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Analyze the construction of steel structures, including factory sheds and long-span structures. They will evaluate structural design principles and synthesize this knowledge to propose efficient and cost-effective solutions for steel construction projects.
- Comprehend details of roofs, roof trusses, waterproofing, and rainwater disposal for steel structures. They will apply knowledge of roofing systems and waterproofing techniques to design resilient and durable roofing solutions for steel structures.
- Understand steel columns, portal frames, North light trusses, tubular monitor roof trusses, and steel monitor trusses. They will analyse the structural properties and applications of these components, demonstrating proficiency in incorporating them into steel construction projects.
- Understand multi-storied steel frame structures, their connections, and components. They will evaluate design considerations for multi-story buildings and propose appropriate structural systems and connections to ensure structural integrity and stability.
- Analyse the structural behaviour and load distribution of space frames, applying this knowledge to design efficient and lightweight structural systems for various building types.

References:

1) W.B. Mc Kay, Building Construction Volume 1 to 4
2) R. Barry, Building Construction Volume 1 to 5
3) Francis Ching D.K., Building Construction Illustrated
4) S.K. Sharma, Civil Engineering construction Materials
5) Sushil Kumar, Building Construction

Semester 6								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC355C	Theory of Structures – VI	2	50	50	--	2

COURSE CONTENT:

- Introduction to brick masonry pillars and walls - Load Carrying capacity of Brick Pillar and Brick wall - Design of brick masonry pillars and walls - Design of masonry retaining walls – lateral earth pressure – stability of retaining walls - Design of masonry foundation – types of foundation – loads acting on the foundation – Elementary
- Seismology-Causes of earthquakes-Seismic waves. Earthquake hazard map of India - Seismic design philosophy- Earth quake effects on ground.
- Behaviour of Masonry building during earthquakes. Earth quake resistant provisions - Earthquake resistant Reinforced Concrete Structures Study of shear walls and diagonal framing - Earthquake resistant
- Reinforcement detailing – Seismic vulnerability assessment and retrofitting of RC building and masonry buildings – Earthquake effects on non-structural elements - Prevention of non-structural damages.

REFERENCES:

1) Pankaj Agrawal, Manish Shrikhande," Earthquake Resistant Design of Structures, PHI learning Pvt. Ltd
2) Shashikant K. Duggal," Earthquake Resistant Design of Structures
References Books:
3) IS 4326: 1993
4) IS 1893:2002
5) IS 13920:2016
6) CVR Murty, "Earthquake Tips", National Information Centre of Earthquake Engineering , www.nicee.org/EQtips.php

Semester 6								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC363C	Building Services – III (Electrical)	3	75	75	--	3

COURSE CONTENT:

- Electrical services
  Circuits – series and parallel; Common domestic installations – water heater, radiator, etc.; Wires – specifications and carrying capacity and calculation of electrical loads; Types of Switches, sockets and fixtures; Design considerations for electrical installations. Lightening conductors and other safety measures for buildings; Wiring systems – methods of wiring, joint and loop in; Types of electrical wiring – batten, capping and casing, concealed, conduits, etc.; Wiring material – types, sizes and specifications, main switch, MCB, DB meter.
- Fire-Fighting
  Causes and spread of fire; Combustibility of materials and safety norms; Fire detection and firefighting equipment – smoke detectors, monitoring devices, alarm systems, etc.; Design of fire escapes for high-rise buildings and NBC norms for fire-fighting.
- Illumination
  Light and its propagation, reflection, radiation, transmission and absorption; Definitions and units of flux, solid angles, luminous intensity, brightness; Laws of illumination, types of illumination schemes – direct, semi direct, indirect and diffused lighting and their design considerations; Light flux method for calculation of numbers of lamps for illumination; Incandescent, sodium vapor, mercury vapor, fluorescent, neon and LED lamps, etc.; Types of luminaries for interior and exterior lighting; Residential , commercial, industry, flood and street lighting; Tests before commissioning of electrical services.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Analyze the laws of electrical circuits, including Ohm's and Kirchoff's laws, and apply basic principles of electricity. They will synthesize this knowledge to solve electrical circuit problems and predict circuit behavior.
- Differentiate between types of circuits, including series and parallel circuits. They will evaluate the advantages and limitations of each circuit type and apply appropriate circuit configurations to optimize electrical system performance.
- Evaluate specifications and carrying capacity of wires, and calculate electrical loads. They will apply knowledge of electrical standards and regulations to design efficient and safe electrical systems.
- Synthesize design considerations for electrical installations, including protection against overload, short circuit, earth fault, and lightning conductors. They will apply safety standards and best practices to develop resilient and reliable electrical systems.

REFERENCES:

1) National Building Code of India: National Electrical Code.
2) Kothari and Nagrath, Basic Electrical Engineering
3) O.P. Gupta, Energy Technology
4) John Mathew, Introduction to the Design and Analysis of Building Electrical System
5) Gondzik, Mechanical and Electrical Equipment for Building
6) Raina & Bhattacharya, Electrical Design Estimating and Costing.
7) Keyoumars Ehteshami, Handbook of Fire Protection and Safety
8) Kelly & Connell, Interior Lighting Design - A Student's Guide.

Semester 6								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PE	E	ARC366E	Discipline Centric Elective – II / MOOCs*	3	75	--	75	3

COURSE CONTENT:

- To explore allied disciplines which will contribute to the architectural and design training of the student.

Suggestive list:

- Film and Architecture
- Vernacular Architecture
- Rural Habitat
- Furniture Design
- Housing
- Construction Management
- Urban and Regional Planning
- Disaster Management
- Architectural Journalism
- Theatre/Film Set Design
- Marketing Skills
- Building Systems Integration
- Visual Communication
- GIS

- To undergo the coursework/workshop
- To document the process of the course undergone
- To prepare a report/ portfolio of the work done
- To demonstrate the learning's of the course.
- To present the work in a forum.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Recall foundational concepts and theories relevant to the chosen elective within the department's specialization. and analyze real-world case studies and examples to contribute towards knowledge production and identify the challenges and opportunities in the subject.

**1. MOOCs courses shall be approved by the HoD on prior basis.*

2. Any expenditure towards registration fees or examination fees for taking MOOCs courses will be borne by the student himself / herself.

3. Earning of credits by opting MOOCs courses shall be governed by the statutes laid down by the university as notified.

Semester 6								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC368C	Estimation, Costing and Valuation	3	75	75	--	3

COURSE CONTENT:

- Introduction to estimation
- Specification: Detailed specifications for (Case study based)
- Earthwork excavation in foundation
- Cement concrete in foundation
- Ashlar masonry
- Brick work in super structure
- R.C.C roof slab
- Woodwork for windows and doors
- Cement concrete flooring
- Plastering in Cement mortar
- Distempering
- Painting woodwork
- Asbestos cement corrugated sheet roofing
- Detailed estimate
- Exercise: To conduct market survey and to collect information on building materials along with rates. To prepare Estimate for an existing building.
- Valuation

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Analyze the principles of estimation in construction projects. They will evaluate various methods and techniques used in estimating project costs and synthesize this knowledge to develop accurate and reliable cost estimates.
- Detail out specifications for various construction activities. They will interpret project requirements and define detailed specifications for materials, workmanship, and quality standards, ensuring adherence to project goals and regulatory requirements.
- Prepare detailed estimates for construction projects, including materials, labor, and equipment costs. They will apply quantity takeoff techniques, analyze unit rates, and utilize cost databases to generate comprehensive estimates that support project planning and budgeting.

REFERENCES:

Semester 6								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
SEC	C	ARC369C	Working Drawing	2	50	--	50	2

COURSE CONTENT:

- Introduction to working drawings: shop drawings / vendor drawings.
- Various formats for working drawing preparation, various types of vendor drawings, such as aluminium composite panels, steel doors, fire rated doors, curtain wall systems, aluminium windows, etc.
- Working drawing details:
- Developing Key plans, General Arrangement Plans, Part plans, Roof Plan / Terrace Plan, and the like.
- Excavation drawings, Foundation drawings, Center-line drawings, Floor Plans, Sections, Elevations.
- Basic internal electrical and plumbing drawings.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Evaluate the purpose and importance of working drawings, including shop and vendor drawings. They will analyze how these drawings facilitate communication between designers, contractors, and vendors, demonstrating an understanding of their role in the construction process.
- Classify formats for preparing working drawings and differentiate types of vendor drawings for various components. They will assess industry standards and select appropriate formats and drawing types to effectively communicate design intent and specifications.
- Synthesize key plans, general arrangement plans, part plans, roof plans, and terrace plans. They will combine architectural principles and technical specifications to develop comprehensive drawings that accurately depict spatial relationships and design elements.
- Create excavation drawings, foundation drawings, center-line drawings, floor plans, sections, and elevations. They will apply drafting techniques and interpret technical data to produce detailed and precise drawings that guide construction activities and ensure structural integrity.
- Generate basic internal electrical and plumbing drawings, and apply them in creating detailed construction drawings. They will analyze building codes and regulations to incorporate electrical and plumbing systems seamlessly into architectural designs, ensuring functionality and compliance with safety standards.

References:

1) Francis D. K. Ching , Architectural Graphics
2) Charles George Ramsey, Architectural Graphics Standard
3) Dennis J. Hall, Architectural Graphics Standard for Residential Construction
4) Travis Kelly Wilson, Drafting & Design: Basics for Interior Design

Semester 7								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC401C	Architectural Design – VII (Adaptive Re-use)	9	225	--	225	9

COURSE CONTENT:

- The exercise shall be a studio-based exercise conducted over a period of 12 week. The students shall work in groups of 3-4 students.
- A design exercise focused on the larger urban context and the intervention of strategies like urban regeneration (adaptive re-use).
- Relationship between Architecture, Urban Design and Urban Planning should be explored at a preliminary level and how the three are interconnected.
- Surveying methods and techniques: conducting an urban design survey. Focus should be on adaptive re-use related issues, aspects and perspectives of the broad urban environment.
- Concepts of public and private realm; understanding different types and procedures of urban design interventions their scale relationships.
- Adaptive re-use and the circular economy. Its impact on urban sprawl by downsizing the negative environmental impacts.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Understanding of Adaptive Reuse Principles: Students will be able to articulate the principles of adaptive reuse.
- Apply Analytical Skills to Existing Structures: Students will be able to identify and analyze existing buildings and assess their potential for adaptive reuse.
- Generate Creative Design Solutions: Students will demonstrate creativity and innovation in generating design proposals while respecting the original character and context of the building.
- Integrate Sustainable Design Practices: Students will incorporate sustainable design strategies into their adaptive reuse proposals.
- Communicate Design Ideas Effectively: Students will effectively communicate their design employing appropriate architectural representation techniques for their concepts and proposals.
- Evaluate Economic Viability: Students will assess the economic feasibility of adaptive reuse projects, considering factors such as construction costs, market demand, and long-term economic sustainability.

References:

1. *Lynch, K. (1984). Good city form.* Boston : MIT Press.
2. *Marshall, S. (2009).* Cities design and evolution. New York : Routledge.
3. *Lang, J. T. (2005).* Urban Design: A Typology of Procedures and Products. Oxford :Elsevier/Architectural Press.
4. *Watson, D., Plattus, A. and Shibley, R. (2003).* Time-Saver standards for urban design. New York :McGraw Hill.
5. *Correa, C. (2010). A Place in the Shade: The New Landscape and Other Essays.* New Delhi :Penguin Books.
6. *Appleton. (1996).* The Experience of Landscape. Wiley.

Semester 7								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
AE	C	ARC402C	Building Construction and Materials - VII	4	100	50	50	4

COURSE CONTENT:

- Earthquake resistant construction for Load bearing and Framed structures. The respective building bye laws, building codes, planning rules and standards. The research and development of techniques and technology by various institutions.
- Seismic performance criteria and performance of structure.
- Long span Arches/ (shell roofs): Understanding them as a structural curved skin.
- Cable structures as a form of long span structure. The broad types of cable structures (suspension type cables and stayed type cable).
- Folded Plate structures, and Space frames. Basic types of folded plate structures (prismatic: rectangular plates, Pyramidal, Prismodial etc.).
- Shell structures.: An understanding of shell structures as lightweight constructions.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Analyze and apply deep foundation methods using piles, including the selection of pile types, pile load testing, and the concept of caissons, to ensure stable and robust structural foundations.
- Evaluate and compare different high-rise building construction systems, including reinforced concrete (RCC) and steel frames, regarding their design principles, characteristics, and structural performance under various loading conditions.
- Demonstrate proficiency in RCC design, including the formulation of design mixes, understanding of neutral axis, and the design of singly and doubly reinforced beams, as well as various types of RCC slabs such as one-way spanning, two-way spanning, continuous, cantilevered, and flat slabs.
- Describe and analyze the construction process involved in erecting high-rise buildings, including the integration of RCC and steel systems, and the coordination of various construction activities.

References:

1. *Bindra, S. P. and Arora, S. P. (2000).* Building Construction: Planning Techniques and Methods of Construction, 19th Ed. New Delhi : Dhanpat Rai Pub.
2. *Ching, F. D. K. (2000). Building Construction Illustrated. 3rd Ed. Wiley.*
3. *Chudley, R. (2008). Building Construction Handbook: Elsevier.*
4. *Punmia, B. C. (1993). Building materials and Construction. New Delhi : Lakshmi Publications.*
5. *McKay, W. B. (2005).* Building Construction Metric Vol.1–IV, 4th Ed. Mumbai : Orient Longman
6. *BIS and relevant IS codes.*
7. *Agarwal, P. and Shrikhande, M. (2010).* Earthquake Resistant Design of Structures. PHI Learning Pvt Ltd.

Semester 7								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
OE	OE	ARC415O	Open Elective – III / MOOCs*	2	50	--	50	2

COURSE CONTENT (to be designed and developed by the concerned faculty)

Sample courses:

- Art Appreciation
- Introduction to Islamic Art & Architecture
- Historic Landscapes of Kashmir
- Visual Communication

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Understand the foundational concepts and theories relevant to the chosen elective and analyze real-world case studies and examples to identify the challenges and opportunities.

**1. MOOCs courses shall be approved by the HoD on prior basis.*

2. Any expenditure towards registration fees or examination fees for taking MOOCs courses will be borne by the student himself / herself.

3. Earning of credits by opting MOOCs courses shall be governed by the statutes laid down by the university as notified.

Semester 7								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PE	E	ARC416E	Discipline Centric Elective – III / MOOCs*	3	75	--	75	3

COURSE CONTENT:

- To explore allied disciplines which will contribute to the architectural and design training of the student.

Suggestive list:

- Film and Architecture
- Vernacular Architecture
- Rural Habitat
- Furniture Design
- Housing
- Construction Management
- Urban and Regional Planning
- Disaster Management
- Architectural Journalism
- Theatre/Film Set Design
- Marketing Skills
- Building Systems Integration
- Visual Communication
- GIS

- To undergo the coursework/workshop
- To document the process of the course undergone
- To prepare a report/ portfolio of the work done
- To demonstrate the learning's of the course.
- To present the work in a forum.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Recall foundational concepts and theories relevant to the chosen elective within the department's specialization. and analyze real-world case studies and examples to contribute towards knowledge production and identify the challenges and opportunities in the subject.

**1. MOOCs courses shall be approved by the HoD on prior basis.*

2. Any expenditure towards registration fees or examination fees for taking MOOCs courses will be borne by the student himself / herself.

3. Earning of credits by opting MOOCs courses shall be governed by the statutes laid down by the university as notified.

Semester 7								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC420C	Town Planning & Settlement Study	2	50	50	--	2

COURSE CONTENT:

- Evolution of cities: Historical towns: Classical and Medieval
- City beautiful movement, Garden cities, Radburn city and neighbourhood planning
- Principles of ekistics
- Urbanization, Rural-urban migration
- History and principles of town planning
- Pioneers of modern town planning-Luis Mumford, Patrick Geddes, Doxiadis, KevinLynch, Tony Garnier, Soriya Y Mata, Le Corbusier, Frank Lloyd Wright
- Planning regulations and building byelaws
- Structural and sectoral plan, ODPs, CDPs, Masterplans, Landuse plans, etc.
- Use of Geographic Information System and Remote Sensing in Planning
- Sustainable Urban Development: Housing-Transport-Public Space

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Identify and analyze the Evolution of cities through key movements such as the City Beautiful movement, Garden cities, Radburn city, and the neighborhood concept, employing evaluative skills to understand their impact on urban development.
- Apply the Principles of ekistics in urban planning scenarios, demonstrating proficiency in their application to address contemporary urban challenges.
- Explain the History and principles of town planning, including urban design and development, utilizing critical thinking skills to assess their relevance in modern urban contexts.
- Evaluate the contributions of Pioneers of modern town planning, such as Luis Mumford, Patrick Geddes, Doxiadis, Kevin Lynch, Tony Garnier, Soriya Y Mata, Le Corbusier, and Frank Lloyd Wright, in shaping contemporary urban planning theories and practices.
- Analyze Structural and sectoral planning approaches, rural-urban migration patterns, planning regulations, Geographic Information System (GIS), Remote Sensing, and sustainable development principles in urban planning contexts, demonstrating proficiency in analysis and interpretation.
- Devise strategies for integrating Geographic Information System (GIS), Remote Sensing, and sustainable development principles into urban planning processes, employing creative problem-solving skills to address diverse urban challenges.

References:

1) Burn, Stanly & Williams, Cities of the world – World Regional Urban Development
2) Lewis Keeble, Principles of Town and Country Planning
3) John Ratcliffe, An Introduction to Town and Country Planning
4) S.C. Garg, City Planning
5) Arthur B. Gallion and Simon Eisner, The Urban Pattern – City Planning and Design
6) Ashok Kumar Jain, Housing for All
7) Ashok Kumar Jain, Town Planning
8) L.R. Kadiyali, Transportation Engineering
9) N.V. Modak, V.N. Ambedkar, Town and Country Planning and Housing

Semester 7								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PEC	C	ARC421C	Building Economics and Project Management	3	75	75	--	3

COURSE CONTENT:

- An introduction to micro-economics: The concepts of the Laws of demand and supply, monopolies, choice of production technology and returns, profit maximization and cost minimization.
- Project Economics: Labour intensive projects and capital-intensive projects. Financing of projects w.r.t agencies and institutions. Concepts of land, labour, capital and materials.
- Economic analysis of projects: The concept and application of cost-control and cash-flow analyses. Concept and applications of cost-benefit and cost-projection feasibility. Real estate investment and return on investments. Building and real estate evaluation. Law relating to real estate development, properties and buildings.
- An introduction to basic concepts of interest and capital, prices and rentals on the investment and the property development.
- Principles of general management, project management, construction projects, scales of projects, human resource parameters of the projects, lifecycle of construction projects.
- Scheduling of projects using Linear Scheduling Methods (LOB) and network based scheduling methods (PERT, CPM). Further introduction to Network representation and Network analysis. An introduction to the concept of Sustainable Project Management and various programmes.
- Strategies for the implementation of Project Management Techniques in the various scenarios of project development.
- An introduction to building contracts and their various pros and cons. An understanding of the security deposits, interim certificates, defect liability periods etc w.r.t. the building contracts. An introduction to the tendering process, tender documents, terminology etc.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Evaluate the relationship between economics and the market, including consumption patterns, characteristics of wants and needs, and their implications for economic behaviour.
- Assess labour-intensive and capital-intensive projects, understand project financing mechanisms, and analyze the role of land, labour, capital, and materials in project economics.
- Conduct economic analysis of projects, including cost-control, cash-flow analysis, cost-benefit analysis, and feasibility studies, with a focus on real estate investment, return on investment, building and real estate evaluation, and relevant laws and regulations.
- Understand fundamental concepts of interest, capital, prices, rentals, and their impact on investment and property development decisions.
- Apply principles of general management, project management, and construction project lifecycle, including human resource management parameters, scheduling techniques (such as Linear Scheduling Methods and network-based methods), and sustainable project management concepts.
- Develop strategies for implementing project management techniques in various project development scenarios, considering project monitoring, scheduling, site analysis, and occupational health and safety considerations.

Semester 7								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PEC	C	ARC422C	Building Bye-laws, Universal Design and Inclusive Design	3	75	75	--	3

COURSE CONTENT:

- Study of building regulations. Overview of administrative processes for obtaining building permits at various stages.
- General land use, building classifications and permissible uses, norms for exterior and interior open spaces, setbacks and margins, norms for building projections in open spaces, considerations in FAR and FSI, guidelines for open green spaces and areas.
- Norms for vehicular areas - means of access, norms for access widths for various types of buildings, requirements of parking spaces, standards for turning radius, access to service areas, Norms for fire-protection.
- Overview of basic terminologies, nature and scope of building codes in special regions like heritage zones, environmentally sensitive zones, disaster prone regions, coastal zones, hilly areas etc.
- The introduction to the principle of universal design and its usability to a wide range of people. Inclusive design of spaces that can be seamlessly used across various user groups in a particular context. The interaction between human ability (and dis-ability) and the design of places (spaces, products etc). The design of spaces for a wide range of people irrespective of human ability.
- An understanding and comprehension of the various building bye-laws and Universal design/Inclusive design.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Analyze and interpret building regulations and administrative processes involved in obtaining building permits at different stages, demonstrating proficiency in navigating the regulatory landscape of construction projects.
- Assess norms and standards for vehicular areas, including means of access, access widths for various building types, parking space requirements, turning radius standards, access to service areas, and fire protection norms, ensuring compliance with safety and accessibility standards.
- Understand the nature and scope of building codes in special regions such as heritage zones, environmentally sensitive zones, disaster-prone regions, coastal zones, and hilly areas, and apply appropriate regulations in these contexts.
- Interpret and apply various building bye-laws and regulations related to universal design and inclusive design, ensuring compliance with accessibility standards and promoting equitable access to built environments for all individuals.

Semester 8								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PEC	C	ARC473C	Architectural Internship / Practical Training Seminar	26	650	--	650	--

COURSE CONTENT:

The objective of the practical training is to expose the students to working in real life projects. The students are expected to work under the supervision of experienced architects registered with the Council of Architecture to understand how various components related to architecture are applied. As part of their practical training, the students are expected to work on presentation/ working drawings, specifications and quantity estimation. The students are also expected to familiarise themselves with coordination of structural and services drawings with architectural drawings. It is desired that the students undertake site visits and understand construction practices.

At the end of the practical training, the students are required to present selected works, which are best representative of the training undergone in the form of drawings. The students are also required to submit a report describing various concepts learnt during training, nature of work done, experiences of site visits, etc. Training attendance log sheets shall also be submitted as part of the report. The report requires to be submitted for internal assessment.

Semester 9								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC501C	Architectural Design – VIII (Urban Design)	12	300	--	300	12

COURSE CONTENT:

- The exercise shall be a studio-based exercise conducted over a period of 12 week. The students shall work in groups of 3-4 students.
- A design exercise focused on the larger urban context, aiming to design large scale architecture/public space.
- Massing and heights of built volumes, street scape, roads, road junctions, lanes road side landscape; the understanding of the urban neighbourhood and its contextual relevance.
- Urban climate, modification of urban climate, impact of urban climate, Environmental issues.
- Urban structure and design rationale, interrelationship between economic activities, public organization, communication systems, urban conservation and land- use structure. The understanding of the public and private realm.
- Understanding the relation between the physical, socio-cultural, socio-economic and environmental dimensions of the urban context and the various strengths, weaknesses, opportunities and threats associated with the same.
- ELEMENTS OF URBAN DESIGN: Concept of public open space; Image of the city and its components such as edges, paths, landmarks, street features.
- Relationship of urban design with economic, environmental and social sustainability; Concepts of Transit Oriented Development, Compact City, Healthy City and Walkable City. Introduction to intelligent urbanism.
- Urban design and its control; Institutional arrangements for design and planning, their roles, powers and limitations; Types of planning instruments, structure plans, master plans and local area plans and zoning guidelines; Design communication and role of public participation.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Collaboratively design large-scale architectural public spaces within the broader urban context, demonstrating proficiency in teamwork and communication skills. Evaluate urban climate factors, including modification techniques and their impact on the built environment, while addressing environmental issues related to urban design.
- Critically assess urban structure and design rationale, exploring the interrelationship between economic activities, public organization, communication systems, urban conservation, land-use structure, and the delineation between public and private realms.
- Analyze the multidimensional aspects of the urban context, including physical, socio-cultural, socio-economic, and environmental dimensions, and identify strengths, weaknesses, opportunities, and threats associated with urban development.
- Apply elements of urban design such as public open space concepts, city image components (edges, paths, landmarks, street features), and understand their role in shaping urban environments.
- Evaluate the relationship between urban design and economic, environmental, and social sustainability principles, including concepts of Transit Oriented Development, Compact City, Healthy City, Walkable City, and intelligent urbanism.
- Present design proposals effectively, utilizing visual communication techniques, oral presentation skills, and critical analysis to articulate design concepts and their implications for the urban fabric.

REFERENCES:

1. *Lynch, K. (1984).* Good city form. Boston: MIT Press.
2. *Whyte, W. H. (1980).* The social life of small urban spaces. Washington D.C: ConservationFoundation.
3. *Krier, R. (1979).* Urban form and space. London: Academy Editions.
4. *Moughtin, C., Cuesta, R., Sarris, C. and Signoretta, P. (2003).* Urban Design - Methods andTechniques. Oxford: Architectural Press.
5. *Watson, D., Plattus, A. and Shibley, R. (2003).* Time-Saver standards for urban design. NewYork :McGraw Hill.

Semester 9								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
OE	OE	ARC515O	Open Elective – IV / MOOCs*	2	50	--	50	2

COURSE CONTENT (to be designed and developed by the concerned faculty)

Sample courses:

- Art Appreciation
- Introduction to Islamic Art & Architecture
- Historic Landscapes of Kashmir
- Visual Communication

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Understand the foundational concepts and theories relevant to the chosen elective and analyze real-world case studies and examples to identify the challenges and opportunities.

**1. MOOCs courses shall be approved by the HoD on prior basis.*

2. Any expenditure towards registration fees or examination fees for taking MOOCs courses will be borne by the student himself / herself.

3. Earning of credits by opting MOOCs courses shall be governed by the statutes laid down by the university as notified.

Semester 9								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PE	E	ARC516E	Discipline Centric Elective – IV / MOOCs*	3	75	--	75	3

COURSE CONTENT:

- To explore allied disciplines which will contribute to the architectural and design training of the student.

Suggestive list:

- Film and Architecture
- Vernacular Architecture
- Rural Habitat
- Furniture Design
- Housing
- Construction Management
- Urban and Regional Planning
- Disaster Management
- Architectural Journalism
- Theatre/Film Set Design
- Marketing Skills
- Building Systems Integration
- Visual Communication
- GIS

- To undergo the coursework/workshop
- To document the process of the course undergone
- To prepare a report/ portfolio of the work done
- To demonstrate the learning's of the course.
- To present the work in a forum.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Recall foundational concepts and theories relevant to the chosen elective within the department's specialization. and analyze real-world case studies and examples to contribute towards knowledge production and identify the challenges and opportunities in the subject.

**1. MOOCs courses shall be approved by the HoD on prior basis.*

2. Any expenditure towards registration fees or examination fees for taking MOOCs courses will be borne by the student himself / herself.

3. Earning of credits by opting MOOCs courses shall be governed by the statutes laid down by the university as notified.

Semester 9								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PE	E	ARC524F	Research Methodology	2	50	50	--	2

COURSE CONTENT:

- Understanding Architectural Research, its domain and strategies.
- Design and Research – Comparable and Shared Qualities of design and research.
- Research Methods in Architecture
- Defining Scope and Objectives in Research.
- Referencing and Formatting.
- Various styles of referencing – APA (American Psychological Association) style, MLA (Modern Language Association) style, Chicago/Turabian style.
- Literature Review.
- Proposal Writing

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Remember and recall various styles of referencing including APA style, MLA style, and Chicago/Turabian style.
- Understand and explain the domain and strategies of architectural research, also analyze the comparable and shared qualities of design and research.
- Understand and interpret early and alternative frameworks in architectural research.
- Analyze and assess the process of defining scope and objectives in research also understand and explain an overview of research methods.
- Analyze and compare and contrast qualitative, quantitative, experimental, and mixed-mode research methods.
- Evaluate and analyze case studies to understand research methodologies and outcomes and utilize appropriate referencing and formatting techniques in academic writing.

REFERENCES:

1) Linda N. Groat, David Wang: Architectural Research Methods
2) Ajla Aksamija: Research

Semester 9								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PEC	C	ARC525C	Dissertation - Thesis Preparatory	3	75	--	75	3

COURSE CONTENT:

The dissertation is supposed to introduce students to structured, logical and focused research writing and outcomes. The subject of the enquiry may be related to the Final Architectural Thesis which shall be conducted in the final semester.
A report on the subject must be submitted in format as prescribed by the department.

LEARNING OUTCOMES:
After successful completion of this course, students shall be able to understand;

- Demonstrate effective communication skills in presenting research findings and design proposals in the prescribed format specified by the department, including clear articulation of methodology, design objectives, site selection criteria (if applicable), and recommendations.
- Apply feedback received from faculty and peers to revise and refine the dissertation report, demonstrating the ability to incorporate constructive criticism and improve the quality and coherence of the research and design outcomes.

REFERENCES:

1. *Borden, I. and Ray, K. R. (2006).* The dissertation: an architecture student's handbook. 2nd Ed. Oxford: Architectural Press.
2. *Fink, A. (1998).* Conducting research literature reviews: from paper to the Internet. Thousand Oaks: Sage.

Semester 9								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC526C	Climate Change and Disaster Management	2	50	50	--	2

COURSE CONTENT:

- Principles of climate-resilient design: passive design strategies, energy efficiency.
- Strategies for designing buildings and communities that can withstand and adapt to climate-related hazards
- Identification and characterization of natural hazards: floods, hurricanes, earthquakes, wildfires, and droughts
- Methods for assessing vulnerability, exposure, and risk to natural hazards in the built environment
- Strategies for disaster preparedness and emergency response in architectural design and planning
- Design considerations for evacuation routes, emergency shelters, and disaster recovery facilities
- Role of resilient infrastructure and urban systems in mitigating the impacts of climate change and natural disasters
- Design strategies for resilient transportation, water supply, energy distribution, and communication systems
- Overview of disaster risk reduction policies, regulations, and governance structures at the local, national, and international levels
- Role of urban planning, land use policy, building codes, and zoning regulations in reducing disaster risk

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to understand;

- Classify and assess various natural hazards such as floods, hurricanes, earthquakes, wildfires, and droughts, utilizing evaluative skills to characterize their characteristics and impacts.
- Analyze and synthesize strategies for designing buildings and communities capable of withstanding and adapting to climate-related hazards, utilizing critical thinking skills to assess complex scenarios.
- Utilize methods for assessing vulnerability, exposure, and risk to natural hazards in the built environment, demonstrating proficiency in analysis and interpretation.
- Devise strategies for disaster preparedness and emergency response in architectural design and planning, employing creative problem-solving skills to address diverse challenges.
- Design evacuation routes, emergency shelters, and disaster recovery facilities, utilizing conceptualization and planning skills to ensure effectiveness and accessibility. Also, assess the role of urban planning, land use policy, building codes, and zoning regulations in reducing disaster risk, demonstrating proficiency in analysis and evaluation.
- Develop design strategies for resilient transportation, water supply, energy distribution, and communication systems, utilizing synthesis and creativity to integrate resilience principles into infrastructure planning.

REFERENCES:

Semester 9								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
SEC	C	ARC527C	Building Information Modelling	2	50	--	50	2

COURSE CONTENT:

- The course introduces the student to the concept of Building Information Modelling. Theoretical understanding on BIM.
- Demonstration of interface between BIM and various related software (e.g. Revit, Inventor, CreO etc.)
- Hands-on computer application of 2D, 3D, MEP and manufacturing design / drawings and presentations.
- It may be structured as:
    1. Fundamentals of Building Information Modelling (BIM) and Basic Revit Applications.
    2. Fundamentals of Building Information Modelling (BIM) and Advanced Revit Applications.
    3. Building Information Modelling (BIM) and Revit MEP Applications and Interface for Large Projects.

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Recall the fundamental principles and concepts of Building Information Modeling and recognize the importance of data management and interoperability in BIM processes.
- Explain the role of BIM in the lifecycle of a building project, from design to construction and maintenance and interpret BIM models and associated data to extract relevant information for decision-making.
- Apply BIM software tools to create and manipulate 3D models of building designs and implement BIM methodologies to coordinate and integrate design elements across disciplines.
- Analyze the impact of BIM on project timelines, costs, and quality outcomes and evaluate the interoperability of BIM software platforms and their compatibility with industry standards.
- Assess the benefits and limitations of different BIM implementation strategies for various project types and critically evaluate the effectiveness of BIM in facilitating collaboration among project stakeholders.

REFERENCES:

1) Lee, G., Eastman, C., Teicholz, P., Sacks, R. (2018). BIM Handbook: A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers. Germany: Wiley.
2) Baldwin, M. (2019). The BIM Manager: A Practical Guide for BIM Project Management. Austria: Beuth Verlag GmbH.

Semester 10								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PC	C	ARC551C	Architectural Design – IX (Thesis)	20	500	--	500	20

COURSE CONTENT:

The Architectural Thesis is the culmination of the development of the student's knowledge, skills and creativity over the course of studies in architecture. It is an occasion for exercising conscious choices in the field, based on the student's personal abilities and inclinations, and for testing out his commitment. The student, in consultation with the faculty, is expected to demonstrate through an imaginative approach, his expertise in effecting positive changes in our built environment. The scope and extent of the thesis work shall be substantial and realisable in application or concept as appropriate to the selected area of work.

REFERENCES:

1) Groat, L. N., Wang, D. (2013). Architectural Research Methods. Germany: Wiley.

Semester 10								
Classification CoA / IUST		**Subject Code**	**Subject Title**	**No. of Credits**	**Marks Distribution**			**Hours / Week**
					IA	**WE**	**VV**	
PEC	C	ARC578C	Professional Practice	2	50	50	--	2

COURSE CONTENT:

- Overview of the architectural profession: roles, responsibilities, and career paths.
- Understanding the regulatory framework governing architectural practice, including licensure requirements, professional standards, and codes of conduct
- Ethical principles and standards in architectural practice: honesty, integrity, confidentiality, and accountability
- Case studies and scenarios exploring ethical dilemmas and considerations in architectural decision-making
- Documentation and record-keeping in architectural practice: project files, meeting minutes, and correspondence
- Financial aspects of architectural practice: fee negotiation, fee proposals, and project budgeting
- Tracking project expenses, invoicing clients, and managing cash flow in architectural projects
- Overview of construction contract administration processes and procedures
- Roles and responsibilities of architects during the construction phase: contract administration, submittal review, and site visits
- Importance of lifelong learning and professional development in architectural practice
- Opportunities for continuing education, professional certification, and participation in professional organizations and industry events
- Analysis of real-world legal, regulatory, and ethical issues faced by architects
- Discussion and debate on case studies involving professional misconduct, contractual disputes, and legal liabilities in architectural practice

LEARNING OUTCOMES:

After successful completion of this course, students shall be able to;

- Recall the ethical principles governing professional conduct in the relevant field and recognize common challenges encountered in professional settings and the strategies to address them.
- Explain the importance of professional integrity and its impact on individual careers and organizational reputation and interpret codes of conduct and standards relevant to the profession.
- Demonstrate comprehension of the roles and responsibilities of professionals within different contexts and apply ethical decision-making frameworks to resolve dilemmas encountered in professional scenarios.
- Critically evaluate case studies and real-world examples to identify ethical implications and potential consequences of professional actions and assess the effectiveness of different approaches to ethical decision-making in various professional contexts
- Implement effective communication strategies in professional interactions with colleagues, clients, and stakeholders. and utilize problem-solving techniques to address real-world challenges in professional practice.
- Evaluate the ethical implications of emerging trends and issues within the profession and critique professional codes of conduct and standards, proposing improvements where necessary.

REFERENCES:

1) COA. (1989). Architects (Professional conduct) Regulations, Architectural Competition guidelines. Council of Architecture Publications.
2) COA. (2005). Handbook of Professional Documents. Council of Architecture.
3) Apte, V. S. (2008). Architectural Practice and Procedure. Pune : Padmaja Bhide