

Madhav Institute of Technology & Science, Gwalior
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)
SCHEME OF EXAMINATION - BACHELOR OF ARCHITECTURE

Course outcome First Year First, Second & Third Year, 2020

210101 - Architectural Design – I	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Identify the elements and principle of design theory
	CO2	Associate various graphical elements
	CO3	Apply principle of design/additive & subtractive form (using 2d/ 3d compositions)
	CO4	Illustrate the color theory principles using color compositions & texture
	CO5	Evaluate the geometric & organic forms (2D & 3D in building)
	CO6	Develop analytical thinking towards spatial analyses of visual culture
210102 - Architectural Materials	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Classify different types of building materials used primarily in building construction work
	CO2	Analyze building materials and its influence on prevailing architectural styles
	CO3	Illustrate specific use of materials and ascertain their application
	CO4	finalize specific building materials for different types of buildings
	CO5	Consider local material and its application techniques for low cost construction
	CO6	Integrate the market survey of different types of material
210103 – Graphics I	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Visualize the language of architecture & buildings through as two dimensional and three dimensional representations
	CO2	Interpret architectural geometry by applying fundamental principles of drawing
	CO3	Develop the capability of ideation and 3D modeling using drafting tools
	CO4	Describe spatial relationship using sequential thinking
	CO5	Solve basic problems involving graphics and spatial manipulations for architectural applications to represent the future forms of her/his projects
	CO6	Express her/his ideas by drawing using representation techniques and tools in the spatial concept and
210108 – Structure- I	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Elaborate various principles of strength of materials and behavior of forces
	CO2	Establish relationship between the bending to the material property and geometry
	CO3	Apply pure bending and shear equation
	CO4	Analysis the stress and strain conditions due to bi-axial stress system
	CO5	Compute stresses at various level of beam
	CO6	Compute support reactions in simply supported, cantilever and over-hang beams for a given set of loading
210105 – History of Architecture- I	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Visualize basic concepts regarding the historical and architectural development in ancient civilization as an integrated expression of art, culture, vernacular material and techniques of the place
	CO2	Observe diverse artistic and architectural expressions with regard to the historical context in which they are developed
	CO3	Illustrate visual and verbal vocabularies of Indian, Egyptian, west Asiatic and Eastern Architecture
	CO4	Evaluate architectural forms and space with reference to technology, style and character
	CO5	Reproduce with sketches, audio and visuals various architectural forms and styles
	CO6	Develop an appreciation of varied cultures and the resulting architectural productions which are unique in time and place & suitable to the lifestyle of its people
210107 – Workshop- I	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Review various tools and techniques in visual communication and model making
	CO2	Incorporate basics of rendering, presentation skills & model making with various materials
	CO3	Associate properties of different materials and products for designing and model making
	CO4	Apply two dimension and three dimension compositions to designing and model making
	CO5	Produce art works from various materials individually and in team

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	CO6	Integrate these materials in creating their design models in further studies
210109 – Technical English	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Speak clearly effectively and appropriately in a public forum to a variety of audiences and purposes (LOTS1)
	CO2	Prepare and deliver oral presentations and arguments acceptable within the Engineering Profession effectively (LOTS3)
	CO3	Demonstrate knowledge and comprehension of major text and traditions in language as well as its social, cultural and historic context (LOTS3)
	CO4	Read a variety of text critically and analytically so as to demonstrate in writing and / or speech the interpretations of those texts (HOTS4)
	CO5	Interpret text written in English assessing the result in written and oral arguments using appropriate material for support (HOTS3)
	CO6	Implement professional work habits, including those necessary for effective collaboration and corporation with others (HOTS4)
210201 – Technical English	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Interpret architectural design fundamentals (Relationship between people to built forms & built forms to environment)
	CO2	Summarize different functional spaces and their space requirements
	CO3	Identify human standards of design based on ergonomics
	CO4	Analyze pre-design process, design process & conceptualization stages in design
	CO5	Design objects based on the concept of space and form by modifying and evaluating an existing space
	CO6	Express their designs through communication skills – verbal, script & graphics
210202 – Building Construction- I	COURSE OUTCOME- After completion of this course student will be able to-	
	CO1	Elaborate materials and systems, their properties and applications, and their intrinsic relationship to structural systems and environmental performance
	CO2	Compare the material and construction techniques through site visit and market surveys
	CO3	Develop a fundamental understanding of the relationship of materiality to construction systems and techniques
	CO4	Illustrate basic components of a building with its construction details such as Foundation Footing, Wall section, Roofs, and Interior details
	CO5	Produce detail construction drawings sets of building components and construction techniques
210202 – Graphics- II	COURSE OUTCOME: After completion of this course student will be able to	
	CO1	Communicate their ideas through various drawings
	CO2	Visualize the design ideas from various angles
	CO3	Represent advance drawing techniques involving perspective, sciography
	CO4	Produce architectural drawings using perspective, sciography
	CO5	Prepare Measured Drawing of any historical building
	CO6	Integrate these techniques in creating their design drawings in further studies
210208 – Structure- II	COURSE OUTCOME: After completion of this course student will be able to	
	CO1	Identify the concept of various structural elements and system
	CO2	Illustrate the use of different structural systems in building industry
	CO3	Analyze the structural geometry based on strength and stability criteria
	CO4	Appraise the built environment based on specific structural system
	CO5	Analyze simple structural behavior using bending moment and shear force diagrams
	CO6	Apply basic principles of structural mechanics
210208 –	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Summarize basic concepts regarding the historical and architectural development in ancient India
	CO2	Observe the diverse artistic and architectural expressions with regard to the historical context

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History of Architecture- II	CO3	Illustrate visual and verbal vocabularies of Indian Architecture
	CO4	Analyze the diversity of imperial Indian Temple Architecture, Indian Mosques, Tombs, Forts, Cities, etc. including the buildings viewed as architectural masterpieces, and their urban settings
	CO5	Appreciate varied culture resulting in architectural productions which are unique in time and place & suitable to the lifestyle of its people
	CO6	Reproduce with sketches, audio and visuals various architectural forms and styles
210206 – Theory of Design	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Integrate the design communication skills to enable to put forth the design ideas in graphics and literature
	CO2	Interpret the ideologies from works of architects and planners
	CO3	Develop awareness of the natural and built environments (past and present) through critical observation
	CO4	Analyze ideas from abstract thinking
	CO5	Develop an approach to architectural thinking
	CO6	Apply theoretical aspects of design to architectural design
210207 – Workshop II	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Incorporate basics of rendering, presentation skills & model making with various materials
	CO2	Appreciate three dimensional implications of design and techniques of model making
	CO3	Criticize the properties of different materials for various products for designing and model making
	CO4	Review requirements and design consideration of complementing field of architecture and designing such as photography and set designing
	CO5	Develop small scale models using various building construction techniques
	CO6	Design a functional model for real life situation
210311 Architectural Design – III	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to design townhouses and villas
	CO2	Students will be able to design buildings related to education philosophy
	CO3/CO4	Students will be able to maximize the potential of their designing skills within the period
210312- Building Construction - II	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to understand the role of metal in structure technology
	CO2	Students will be able to understand the technicality behind the foundation of a structure and its type.
	CO3	Students will be able to demonstrate their understanding through application in design and detailing of doors, windows & ventilators
	CO4	Students will be able to demonstrate their understanding through application in design and detailing of staircase & masonry.
	CO5	Students will be able to analysis application in working drawing.
210313- Graphics – III	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to apply basic commands in AutoCAD to draw objects..
	CO2	Students will be able to draw complex objects using complex commands in AutoCAD.
	CO3	Students will be able to draw measured drawings.
	CO4	Students will be able to use Photoshop to illustrate building plans, elevations, etc. professionally
210314 - Surveying and Leveling	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to understand and apply surveying instruments and useful formulas used in surveying
	CO2	Students will be able to construct various scales used in surveying
	CO3	Students will be able to apply surveying instruments for surveys
	CO4	Students will be able to apply site survey techniques and will learn how to make layout of buildings.
	CO5	Students will be able to apply levelling and contouring on site surveys.
	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to apply Greek architectural expressions in their own design.

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210315- History of Architecture-III	CO2	Students will be able to apply elements of Roman architecture in their own design.
	CO3	Students will be able to apply elements of Egyptian architecture in their own design
	CO4	Students will be able to apply elements and concepts of West Asiatic Architecture in their own design
	CO5	Students will be able to apply elements of South East & East Asian architecture in their own design

210316- Structures-III	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	To interpret the structural design process and analyse design of RCC foundations for the purpose construction
	CO2	To analyses the structural design details and reinforcement of RCC slabs and staircase for the purpose of construction
	CO3	To interpret the load calculation for structural design of beams and lintel in RCC structure and analyses their structural design details for the purpose of construction
	CO4	To interpret the structural design of columns in RCC structure and the design details using column interaction diagram
	CO5	To interpret the design of flat slab and their structural details
210310 Biology for Architects	CO1	Students will be able to Define basic elements and principles of bio mimicry approaches
	CO2	Students will be able to Analyze natural environment and surrounding to achieve bio mimicry in architecture
	CO3	Students will be able to Experiment three dimensional patterns to achieve low energy consumption in buildings
	CO4	Students will be able to Apply theories and concepts of sustainability to built form and surroundings
	CO5	Students will be able to Designing and around the built structures, without harming our ecosystem
Second Year Fourth Semester 210413 Architecture Design – IV	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to analyze data collected with relevance to the project by identification of a suitable design intervention that would improve the quality of life
	CO2	Students will be able to explore concepts and agglomeration of simple spaces with particular emphasis on the special needs of elderly, handicapped, etc.
	CO3/CO4	Students will be able to maximize the potential of designing within the period.
210414- Building Construction – III	COURSE OUTCOME - After completion of this course student will be able to-	
	CO1	Students will be able to understand the role of concrete in structure technology
	CO2	Students will be able to understand the technicality behind the foundation of a structure and its type
	CO3	Students will be able to analyze different types of slab and its different types on a structure.
	CO4	Students will be able to demonstrate their understanding through application in working drawing of basements ,retaining wall expansion joints
CO5	Students will be able to analyze different finishing material in a project	
210415 - Building Services-I(Water supply & Sanitation)	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to identify the significance of water supply in urban and rural areas, its methods and requirements
	CO2	Students will be able to develop the understanding of drainage systems in buildings and its application
	CO3	Students will be able to analyze the significance of solid waste management in cities and their sustainable methods
	CO4	Students will be able to evaluate the sustainable methods of processing solid waste and strategies for waste management at city level
CO5	Students will be able to compare and develop the plumbing layout of various types of building	
210416 - History of Architecture-IV	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to apply Industrial revolution architectural expressions in their own design
	CO2	Students will be able to apply elements of modernism style in Architecture in their own design.
	CO3	Students will be able to apply elements of DE constructivist style in Architecture in their own design
CO4	Students will be able to apply elements and concepts of Neo-modernism & Postmodernism reactions in Architecture in their own design	

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	CO5	Students will be able to apply elements of Colonial, Post-Colonial & Contemporary style in Indian Architecture in their own design
210417 - Structures-IV	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Student will be able to understand the behavior of steel in construction, its forms and use in different structures
	CO2	Student will be able to understand the methods of designing angle sections, single and compound sections, compression members, lacings and battens
	CO3	Student will be able to comprehend the design of principle and secondary beams in steel construction
	CO4	Student will be able to comprehend the types, selection, estimation of load and designing of steel trusses and girders for construction
	CO5	Student will be able to learn about the use of steel in construction of various long span structures
210421- Elective – 1 Ecology and Environment)	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to summarize elementary knowledge to earth's natural environment
	CO2	Students will be able to highlight emerging human activities creating serious environmental degradation
	CO3	Students will be able to relate urban ecology with sustainable technologies
	CO4	Students will be able to perceive the role of an architect/planner in sustainable development
	CO5	Students will be able to adapt various green/sustainable architectural techniques in one of the student's design problem
210422 - Elective – 1 (Society, Culture and Architecture)	COURSE OUTCOME: After completion of this course student will be able to-	
	CO1	Students will be able to relate sociology with architecture and planning
	CO2	Students will be able to inspect basics of traditional architecture
	CO3	Students will be able to illustrate the site specific nature of architectural design
	CO4	Students will be able to distinguish cultural change and indigenous architectural practices
	CO5	Students will be able to apply rejuvenation in architecture
Third Year Fifth Semester 210501 Architectural Design – V	After completion of this course student will be able to-	
	CO1	Analyze the culture of a place – building types such as the cultural center comprising of spaces such as the art gallery, auditorium for performing arts, library etc.
	CO2	Identify the various common building materials such as brick, concrete, steel & glass.
	CO3	Examine the same building material through Material studio.
	CO4	Illustrate with materials to find suitable artistic & commercial expressions and the learning of design methods for healthcare buildings.
	CO5	Design commercial buildings integrating entertainment spaces, where the student is given exposure to the finer aspects of auditorium design.
	CO6	Express the design with drawings and model to support the concept.
210502 Building Construction - IV	After completion of this course student will be able to-	
	CO1	Summarize Properties and uses of cast iron, wrought iron, pig iron and steel. Market forms of steel: Structural steel, stainless steel, steel alloys
	CO2	Identify various steel members and joints for building industry.
	CO3	Prepare detail drawings of steel doors, rolling shutters etc.
	CO4	Illustrate modern methods of wall and floor construction
	CO5	Design interior wall paneling and suspended ceiling detail drawings
	CO6	Summarize thermal insulation techniques, acoustical treatment details for different spaces.
210503 Building Services-II (Electrical & Mechanical)	After completion of this course student will be able to-	
	CO1	Classify various technical aspects of electrical services.
	CO2	Summarize basic principles of illumination and practical application of lighting while designing a building
	CO3	Explain the importance, installation and working of essential services in buildings.
	CO4	Elaborate the importance and application of mechanical services while designing a building.
	CO5	Develop electrical distribution plans and layout for installation purposes.
	CO6	Develop a comfortable mechanical system for a building by means of various natural and mechanized measures
210504	After completion of this course student will be able to-	
	CO1	Classify various climatic parameters on micro and macro level of site and design shelters according to different climatic conditions.

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Building Sciences & Energy Conservation	CO2	Elaborate the concept of thermal balance in human beings and its statistical parameters.
	CO3	Apply various aspects of solar geometry in building orientation.
	CO4	Apply various principles of thermal design in buildings.
	CO5	Develop designs considering sustainable design tools, design methodology and innovative approach towards eco-designs.
	CO6	Explore various design strategies for building in different type of climatic zones
210601 Architectural Design – VI	After completion of this course student will be able to	
	CO1	Summarize basic concept of spatial planning of different types of buildings such as Hospitality and Infrastructure projects
	CO2	Apply large span structural systems in design
	CO3	Apply building bye laws in building design.
	CO4	Apply various essential services in complex buildings.
	CO5	Analyze the project with respect to various environmental parameters.
	CO6	Design Hospitality and Infrastructure projects
Third Year Sixth Semester 210602 Building Services-III (Acoustic & Fire Fighting)	After completion of this course student will be able to	
	CO1	Summarize concept of acoustics and its various aspects .
	CO2	Identify effect of noise while designing a building.
	CO3	Apply basic concept of firefighting systems in different types of buildings.
	CO4	Identify various suitable sound insulation materials and techniques for construction .
	CO5	Apply the basic principles of acoustics in design.
	CO6	Explore various techniques of firefighting services in large scale buildings.
210608 Site Planning & Landscaping	After completion of this course student will be able to	
	CO1	Summarize various elements of landscape architecture and design.
	CO2	Analyze different aspects of landscape architecture history through various design principles of urban landscape.
	CO3	Examine various parameters of site analysis along with different site influencing factors like topography, hydrology, soil ,landforms etc.
	CO4	Illustrate contours as representation of landforms and its application in analysis of various physical characteristics like grading, drainage pattern, etc.
	CO5	Apply the various techniques in landscape exercise which includes different site planning projects.
210604 Working Drawing	After completion of this course student will be able to	
	CO1	Analyze various finishing materials along with their installation methods.
	CO2	Illustrate various relevant architectural and structural layouts of respective buildings
	CO3	Incorporate various specification aspects during execution of a project.
	CO4	Develop necessary service layout plans of different buildings.
	CO5	Produce working drawing sets for load bearing and a frame structure architectural Design project.
210611 Elective III Housing	After completion of this course student will be able to	
	CO1	Comprehend the history, demand, policies, and various stakeholders in housing.
	CO2	Define the socio-economic aspects, schemes and reconstruction process.
	CO3	Identify various housing standards, guidelines, regulations, norms, amenities, etc.
	CO4	Summarize modern housing construction techniques in context of changing scenario and globalization.
	CO5	Elaborate design process, stages, tasks, methods, approaches of different type of housing projects with respect to varying requirements.
	CO6	Apply the housing principles hereafter.
210614	After completion of this course student will be able to	
	CO1	Elaborate basic concepts of journalism with the main focus on various aspects of architectural journalism.

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Architectural Journalism	CO2	Analyze theoretical and contextual needs for conducting journalism through research
	CO3	Prepare architectural report (critical, appraisal or research) of a project.
	CO4	Prepare architectural photography report
210701 Architectural Design – VII	After completion of this course student will be able to	
	CO1	Analyze and study, pre-design process, design process & conceptualization stages in design.
	CO2	Understand the materials and technology required to build the same.
	CO3	Understand the building byelaws and apply them to the project.
	CO4	Handle large scale buildings such as projects of progressively increasing complexity.
	CO5	Design the projects based on the concept of space and form, Innovate Visualization of projects using computer software is also acquired.
210702 Adv. Building Construction	After completion of this course student will be able to	
	CO1	Study behaviors of various non-conventional and long span structures
	CO2	Understand the concept of Shells and Space Frames.
	CO3	Design and detailing of building materials and components developed by research organizations like CBRI, SERC, NBO & BMTPC
	CO4	Appreciate the difference between RCC and pre stressed concrete.
	CO5	Identify appropriate tall structural systems, shells and folded plates and tensile structure for the space coverage
210703 Project Management & Building economics	After completion of this course student will be able to	
	CO1	Know about the methodology of executing a project.
	CO2	Understand the fundamentals of economics, Land economics and financing.
	CO3	Compute the money values and demand forecasting.
	CO4	Develop valuation of property/building through various valuation methods.
	CO5	Enhance the professional ability as an architect.
210704 Estimating and Costing & Specifications	After completion of this course student will be able to	
	CO1	Write specifications for various items of civil works with a view of controlling quality of work executed at site.
	CO2	Acquire sufficient knowledge of estimation in order that he/she could advice prospective clients on project viability and also monitor/ control project cost.
	CO3	Analyze different types of estimates and their suitability to different kinds of works.
	CO4	Calculate the quantity of different items of work using various estimating methods.
	CO5	Prepare BOQ's for item rate contract.
	CO6	Calculate the approximate estimate, detailed estimate for small scale building projects and low cost housing.
21708 Urban Planning	After completion of this course student will be able to	
	CO1	Elaborate the concepts of eminent Town planners and their contribution to planning thought.
	CO2	Create an overall understanding of classification of settlements, land-use, zoning and types of development plan.
	CO3	Apply simple Town planning techniques.
	CO4	Explore settlements, land-use, zoning, types of development plan.
	CO5	Develop an appreciation of the planning issues involved at the scale of a town or a city.
210801 Architectural Design – VIII	After completion of this course student will be able to	
	CO1	Formulate an intellectual position, explored through architectural design, which reconciles the development of a critical brief with spatial and functional criteria.
	CO2	Conceptualize a brief for a design project, which, through engagement with a series of contexts, seeks to provide a critique of the built environment by proposing alternative spatial, formal, organizational or material solutions.
	CO3	Synthesize a design solution, which combines appropriate architectural expression, cultural response and the fulfillment of the functional requirements of a brief.

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	CO4	Produce appropriate drawings, models and other media of an architectural design which explore, test and express its qualities of space, form, organization and response to physical and other contexts.
	CO5	Integrate appropriate technologies concerning structure, materiality and services into the design proposal.
	CO6	Effectively communicate the design or designs through an exhibition incorporating drawings, models, texts and other appropriate media.
210802 Urban Design	After completion of this course student will be able to	
	CO1	Know about the urban forms and spaces.
	CO2	Understand the urban design issues at the city level.
	CO3	Analyze the difference between the history and the contemporary needs.
	CO4	Develop the strategies that are commonly required to overcome the urban issues.
	CO5	Develop understanding and strategies towards the society. They will be conversant with the problems in community living and how to address the same.
210803 Professional Practice & Ethics	After completion of this course student will be able to	
	CO1	Identify the principal legislative, technical and professional factors influencing the design strategy of a building project.
	CO2	Describe the components and organizational structures and their interrelationships.
	CO3	Define the issues that an architect will consider with reference to building contract law
	CO4	Determine the factors effecting cost
	CO5	Explain the procedures to be followed for compliance with planning and building control regulations.
210804 Dissertation	After completion of this course student will be able to	
	CO1	Understand the fundamentals of Research methods before attempting final year Project Thesis.
	CO2	Study and develop basic research principles and research methods.
	CO3	Develop a sustained and coherent argument on an agreed topic, supported by both secondary and primary sources
	CO4	Communicate the result of a systematic programme of research with clear identification of the topic, research issues, the context and the theoretical perspectives.
	CO5	Evaluate significant information sources referred to and draw coherent conclusions relevant to the topic and issues initially identified, from the observations, evidence and arguments presented.
	CO6	Develop the skill of report writing. Prepare a Dissertation report