

SEMESTER-IV														
S.No.	CODE	SUBJECTS	L	TS	PS	CREDITS (L+0.5TS+1.5PS)	MSE		ESE		TA	MARKS	Course Category	Total Periods
							Theory	Viva	Theory	Viva				
1	ARPC2211	Architectural Design-IV	3	3	1	6	30	20	0	50	100	200	Professional Core (PC)	7
2	ARPC2213	History of Islamic Architecture	3	0	0	3	30	0	50	0	20	100	Professional Core (PC)	3
3	AREP2211	Building Materials & Construction Techniques-IV	2	1	1	4	30	20	50	40	60	200	Essential Program Requirements (EPR)	4
4	AREP2212	Indeterminate Structures	3	0	0	3	30	0	50	0	20	100	Essential Program Requirements (EPR)	3
5	AREP2213	Electrical, Mechanical & Automation) Building Sciences (Acoustics, Illumination,	3	0	0	3	30	0	50	0	20	100	Essential Program Requirements (EPR)	3
6	ARPE2211	Professional Elective-I	3	0	0	3	30	0	50	0	20	100	Professional Elective (PE)	3
7	AREP2221	Computer Aided 3D Modelling	0	2	0	1	0	20	0	40	40	100	Essential Program Requirements (EPR)	2
8	AREP2222	Environmental Lab	0	2	0	1	0	20	0	40	40	100	Essential Program Requirements (EPR)	2
Total			17	8	2	24						1000		



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	Architectural Design-IV
3.	L-T-P Structure	3-3-1
4.	Credits/# of period	6/7
5.	Course number (Code)	AR204101AR
6.	Status (Core/Essential/Elective)	Professional Core (PC)
7.	Pre-requisites (course no./title)	ARPC2111-Architectural Design-III
8.	Frequency of offer	Annual
9.	Course Objectives (CO) : 1. To incorporate Climate Responsiveness. 2. To incorporate Water Supply and Sanitation Services. 3. To understand Spatial Organization and Order of Spaces. 4. To understand Development of Architectural Theories.	
10.	Course Syllabus: All courses learnt in this semester and in all previous semesters are subservient to Architectural Design-IV course. The course shall initiate with an Educational Tour accompanied by 1 teacher per 20 students (approx.) for understanding various Architectural Theories, Spatial Organization, Climate Responsiveness, Building Services, etc. The lessons learnt from educational tour shall be submitted in form of Tour Report and learning shall be implemented in further design problems. The students shall be encouraged to deal with architectural theories and their evolution over time. Critical evaluation shall be promoted to trace the changing modes of thought and their reflection in architectural thinking involving Spatial Organization, Order of Spaces and Development of Forms. There shall be at least two design problems during this course to achieve the objectives stated hereabove. This may be done through designing built-forms emphasizing on water supply and sanitation services, climate responsiveness, etc. The suggestive design topics may include multiple spaces viz. hostels, primary school, nursing home, diagnostic center, art gallery, cultural center, community center, open air theatres, club houses, mediation center, spa and wellness center, multi-level car parking, etc. Deliverables shall be in the form of Portfolio/Sheets/Models/Reports/Multi-Media Presentation, etc.	
11.	References: - i. Ching, F. D. (2014). Architecture: Form, space, and order. John Wiley & Sons. ii. De Chiara, J. (2001). Time-saver standards for building types. McGraw-Hill Professional Publishing. iii. National Building Code (NBC), 2016, GoI. iv. Neufert, E., Neufert, P., & Kister, J. (2012). Architects' data. John Wiley & Sons.	



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	History of Islamic Architecture
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	AR204102AR
6.	Status (Core/Essential/Elective)	Professional Core (PC)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand the form-space relationships in ancient architecture. 2. To learn impact of geographical, geological, climatic, historical, technological, social and religious factors influencing Architecture. 3. To understand the architectural characters.	
10.	Course Syllabus: Unit-1: Early Islamic Architecture at Global Level a. Principle of planning in Islamic Architecture b. Study of Islamic Architecture in different countries. Unit-2: Pre Mughal Islamic Architecture in India a. Development of Pre Mughal Islamic Architecture (Indian) b. Pre-Mughal rule (Delhi Sultanate) with Examples Unit-3: Mughal Architecture a. Pre Akbar period b. Akbar –Jahangir period c. Period of Shajahan d. Period of Aurangzeb and after Unit-4: Indian Provincial Islamic Architecture a. Development of Provincial Islamic Architecture b. Examples of Provincial Islamic Architecture in India. Unit-5: Colonial Architecture in India a. Influence and Impacts of Colonization of Dutch, French, Portuguese and British on Architecture b. Indo-saracenic style – Development and characters c. Examples of Colonial Architecture	
11.	References: i. Brown, P. (1983). Indian Architecture (The Islamic Period). Bombay, Taraporevala and Sons. ii. Deloche, J. (2007). Studies on fortification in India. Pondicherry, Institute Francais De Pondichery. iii. Fletcher, B., & Cruickshank, D. (1996). Sir Banister Fletcher's a history of architecture. Oxford: Architectural Press. iv. Grover, S. (2003). The Architecture of India (Islamic Period). New Delhi, Vikas Publishing Housing Pvt. Ltd. v. Hattstein, M. (2015). Islam : Art and Architecture. Königswinter, Ullmann Publishing. vi. Hoag, J.D. (1977). Islamic Architecture. New York, Harry N. Abrams Inc. vii. Jain, A.K. (2015). Colonial Delhi: Imperial and Indigenous. New Delhi, Kaveri Books. viii. Jon Lang, J., Desai, M. and Desai, M. (1998). Architecture and Independence: The Search for Identity--India 1880 to 1980 London, Oxford University Press. ix. Kostof, S. (1985). A History of Architecture - Setting and Rituals. London, Oxford University Press. x. Lloyd, S. and Muller, H.W. (1986). History of World Architecture – Series. London, Faber and Faber Ltd., xi. Michell, G. (1995). Architecture Of The Islamic World: Its History And Social Meaning. London, Thames and Hudson. xii. Nagach, B.L., Suresh, K.M. and Sharma, D. P. (2009). Encyclopedia of Indian Architecture: Hindu, Buddhist, Jain and Islamic. Delhi, Bharatiya Kala Prakashan. xiii. Pandya, Y. (2013). Concepts of Space in Traditional Indian Architecture. Grantha Corporation. xiv. Roth, L. M. (2007). Understanding architecture: Its elements, history, and meaning. Boulder, Colo: Westview Press. xv. Sahai, S. (2008). Forts & Palaces of India. Delhi, Prakash Books. xvi. Stierlin, H. (1977). Encyclopaedia of world architecture. Macmillan.	



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	Building Materials and Construction Techniques-IV
3.	L-TS-PS Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	AR204001AR
6.	Status (Core/Essential/Elective)	Essential Program Requirement (EPR)
7.	Pre-requisites (course no./title)	AREP2111-Building Materials and Construction Techniques-IV
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To study cement and concrete as building materials. 2. To study various building components made up of concrete. 3. To understand design and working of RCC slabs, beams, columns, staircases and substructures.	
10.	Course Syllabus: The course focuses on cement and concrete as building materials. Other associated building materials, with fixing details, required to explain the topics should be incorporated for comprehensive understanding. Emphasis should be given to on-site construction practices. Unit-1: Introduction to Concrete, Scaffolding and Form- work a. Concrete – Types, Mixes and Admixtures, Properties, Uses, Pondering and Curing, Testing, Faults and Failures, etc. b. Scaffolding – Types, Uses, Components, Fixing details, etc. c. Form-work – Types, Uses, Components, Fixing details, etc. d. Shoring and Underpinning – Types, Uses, Fixing details, etc. e. PCC and DPC – Uses, Properties, Mixes, Laying Techniques, etc. Unit 2: RCC Slabs a. RCC Slab – Types, Properties, Cross-sections and Reinforcement, Construction Techniques, etc. b. Complex Slabs – Flat, Coffered, Sunken, Cantilevered slab, etc. Unit 3: RCC Beams and Columns a. Beams – Types, Cross-sections and Reinforcement, Construction Techniques, etc. b. Columns – Types, Cross-sections and Reinforcement, Construction Techniques, etc. c. Junctions – Beam junctions (like L-junction, T-junctions, Cross junctions), Beam-Column junctions, etc. Unit 4: RCC Staircases a. Staircase – Types, Uses, Waist slab, Stringer, Treads and Risers, Nosing, Rise and Goings, Cross-sections and Reinforcement Details, etc. b. Complex Staircases – Folded plate, Helical, Spiral, Suspended, etc. Unit 5: RCC Sub-structure a. Foundations – Types, Uses and its application, Various Cross-sections and Reinforcement Details. b. Plinth Beams and Ground Beams – Types, Uses and its application, Various Cross-sections and Reinforcement Details. c. Concrete Floorings – Types, Uses and its application, Various Cross-sections and Reinforcement Details. <i>Note: Deliverable shall be in form of portfolio/sheets/models/reports/multi-media presentations, etc. with hands-on experience.</i>	
11.	References: i. Barry, R. (1999). The Construction of Buildings Vol. 2. 5th Ed. New Delhi: East-West Press. ii. Foster, J. and Mitchell, S. (1963). Building Construction: Elementary and Advanced, 17th Ed. London: B.T. Batsford Ltd. iii. Hailey and Hancock, D. W. (1979). Brick Work and Associated Studies Vol. II. London: MacMillan. iv. McKay, W. B. (2005). Building Construction Metric Vol. I-IV. 4th Ed. Mumbai: Orient Longman. v. Moxley, R. (1961). Mitchell's Elementary Building Construction. London: B. T. Batsford. vi. Rangwala, S. C. (2019). Building Construction 33rd Ed. Anand: Charotar Publishing House Pvt. Ltd. vii. Sushil-Kumar, T. B. (2003). Building Construction. 19th Ed. Delhi: Standard Publishers. viii. Punmia, B.C. and Jain, A. K. (2016). Building Construction. 11th Ed. New Delhi: Laxmi Publications. ix. Rangwala, S. C. (2017). Engineering Materials: Material Science. 43rd Ed. Anand: Charotar Publishing House Pvt. Ltd.	



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	Indeterminate Structures
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	AR204002AR
6.	Status (Core/Essential/Elective)	Essential Program Requirement (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To study structures based on redundancy and indeterminacy. 2. To outline the behavior of structural elements in buildings 3. To understand the various methods used in the structural analyses.	
10.	Course Syllabus: Unit-1: Introduction to Statically Indeterminate structures a. Statically Indeterminate structures, Redundancy, Degree of Indeterminacy of Beams. b. Frames and Truss. Method of Consistent Deformation. c. Fixed end moments of a built-in- beam with concentrated, uniformly distributed and moments. Unit-2: Three moment Method a. Theorem of three moments, Determination of bending moment and shear force diagram, etc. Unit-3: Slope Deflection Method a. Slope deflection Method. b. Application to continuous beams and portal frames with and without sway. Unit-4: Moment Distribution Method a. Moment Distribution Method. b. Application to continuous beams and portal frames with and without sway. c. Kani's Method. Unit-5: Special Structure a. Shell and Dome Structure. b. Plate Structure. c. Tensile Structure, etc.	
11.	References: i. Bhavikatti, S. S. (2005). Structural Analysis-I. Vikas Publishing House. ii. Bhavikatti, S. S. (2016). Structural Analysis-II. Vikas Publishing House. iii. Neal, B. G. (1963), The plastic methods of structural analysis iv. Punmia, B. C. (1984). Strength of materials. Delhi: Standard Pub Dist. v. Punmia, B. C. (2004). SMTS-II Theory of Structures. Firewall Media. vi. Wang, C. K. and Saunders, H. (1986). Intermediate structural analysis.	



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	Building Sciences
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	AR204003AR
6.	Status (Core/Essential/Elective)	Essential Program Requirement (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To develop the understanding of Electrical and Mechanical building services. 2. To study Heat, ventilation and air conditioning in buildings.	
10.	Course Syllabus: Unit-1: Electrical-I a. Basic principles of electricity, demand calculations and illumination requirements, norms and standards. b. Distribution systems of electricity. c. Elements of building wiring system – feeders, panel board, circuit breakers' fuses, switches, etc. d. Schematic layout of installations and points for different building types. e. Schematic diagram of electric installations with use of symbols. Unit-2: Electrical-II a. Electrical fittings and fixtures. b. Distribution boards and layout of points. c. Different materials and specification. d. Earthing techniques, Lighting conductors, Low voltage supply (data and telephone), etc. e. Study and application of relevant rules and regulations of Electricity boards. Unit-3: Heat, Ventilation and Air-conditioning a. Introduction to Air change, Air ducts, Heating, Ventilation, AHUs, etc. b. Air conditioning systems - methods, equipment, Selection criteria, fittings, fixtures, accessories and components. c. Fundamental principles of Psychometrics and heat transfer. Unit-4: Air-conditioning a. Ducting principles, layout schemes and placement of air conditioning outlets in central air conditioning systems. b. Load calculations of air-conditioning systems. c. Emerging Technologies – VRV, VRF, Heat Recovery Systems, etc. Unit-5: Automation a. Types of Elevators, Escalators and Auto-walks. b. Designing Elevators – no. of elevators, capacity, elevator bank, etc. c. Design and construction of pit, well and machine rooms for elevators.	
11.	References: i. Ananthanarayanan, P. N. (2013). Basic refrigeration and air conditioning. New Delhi: McGraw-Hill Education (India). ii. Gupta, N. C. (2016). Comprehensive HVAC system design: A handbook on practical approach to air conditioning, heating and ventilation systems. London: MV Learning. iii. Matthews, J. (1993). Introduction to the design and analysis of building electrical systems. Springer Science & Business Media. iv. McQuiston, F. C., Parker, J. D., & Spitler, J. D. (2000). Heating, ventilating and air conditioning: Analysis and design. New York, NY: Wiley. v. Mechanical and Electrical Equipment for Buildings by Walter T. Grondzik, Alison G. Kwok, Benjamin Stein. vi. NATIONAL BUILDING CODE OF INDIA 2015 vii. Sclater, N., & Traister, J. E. (2003). Handbook of electrical design details. New York: McGraw-Hill viii. Severns, W. H., & Fellows, J. R. (1958). Air conditioning and refrigeration.	



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	Theory of Design (Professional Elective (PE)-I)
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	AR204201AR
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-I
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): - To develop a working knowledge of the most relevant—past, present, future—architectural theories, - To study, discuss, and document theoretical concepts and tenets against a general theoretical framework - To develop approach towards architectural design theory.	
10.	Course Syllabus: Unit-1: The genesis of indigenous architecture and social aspects - Role of geographical and cultural signs, evolution. - The concept of measuring, function, style, type, social purpose and ideology. - The relationship of architecture to the sciences, arts, economics and politics. - Study of selected writing, and buildings in monumental and vernacular scales. Unit-2: Design Methodology - Design as a multivariate problem solving process. - Theories of Program and Function, thinking techniques, information processing and research methods. - Generators of creativity, design matrices and system integration. Unit-3: Inspirations into Architecture - Role and principles of art, music, literature etc. in relationship with architecture - Mind- mapping, Aesthetics and its co- relation Unit-4: Evolution of various theories of Design - Contribution of various theories and movements in Architecture like, Bauhaus, Constructiveness, minimalist, etc. Unit-5: Design Evaluation and Criticism - Value judgments in design. - Appreciation of designer's skills, theories of perception and variability of perception. - Theoretical issues in contemporary architectural thoughts.	
11.	References: - Day, C. (1990). Places of the soul: Architectural and environmental design as a healing art. The Aquarian Press. - Eisenman, P. (1999). Diagram Diaries. New York : Universe. - Heidegger, M. (1993). Building Dwelling Thinking. Basic Writings. HarperCollins. - Johnson, P. and Wigley, M. (1988). Deconstructivist Architecture. New York : Museum of Modern Art. - Kruft, Hanno. (1994). A History of Architectural Theory, From Vitruvius to the Present, Princeton Architectural Press. - Lefebvre, H. (1991). The production of space. Oxford: Cambridge. - Merleau-Ponty, M., and InEdie, J.M. (1964). The primacy of perception. North Western University Press. - Pallasmaa, J. (2005). The eyes of the skin: Architecture and the senses. Chichester : WileyAcademy. - Paul, A. J. (1994). The Theory of Architecture—Concepts & themes. New York : Van Nostrand Reinhold. New York - Pawlyn, M. (2011). Bio-mimicry in Architecture. London : RIBA Publishing. - Salingaros, N. A. (2006). A Theory of Architecture. Solingen : Umbau-Verlag. - Smith, K. H. (2012). Introducing architectural theory: Debating a discipline. New York - Theory of Architecture: Ian Foster: Routledge - Tschumi, B. (1994). Architecture and disjunction. Cambridge, Massachusetts : MIT. - Venturi, R. (1966). Complexity and Contradiction in Architecture. New York : The Museum of Modern Art.	



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	Art in Architecture (Professional Elective (PE)-I)
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	AR204202AR
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-I
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): - To disseminate a broad overview of Art and Design. - To understand Art awareness, creativity and cultural understanding. - To study design as linkage of Multidimensional creative Art.	
10.	Course Syllabus: Unit-1: Introduction- Defining the disciplinary differences - Introduction to various types of Art - Concept of beauty and Aesthetics. - Evolution of art and design. Unit-2: Art and Design- A historical perspective - History of Art through various ages - Importance of Visual perception - Design elements from nature. Unit-3: Expression of Art and Design - Relationship between Art and Design with man, space and environment - Concept of space - Articulation of form, sense of enclosure, Organization of spaces Unit-4: Introduction to theories - Golden proportion - Theories of scale and proportion, Vitruvian theory, Modular man, etc. - Principles of Design and elements of Architecture. Unit-5: Relations in Art, Design and Architecture - Factors influencing the process of Art, Design and Architecture. - Form and function. - Review of selected examples	
11.	References: - Cantanese, A. J. and Snyder, J. C. (1988). Introduction to Architecture. New York : McGraw hill Books Co. - Ching, F. D. K., Jarzombek, M. and Prakash, V. (2010). A Global History of Architecture. 2nd Ed. John Wiley & Sons. - Fred, S. K. (2009). Art through the ages a Global History. 3rd Ed. Clark Baxter. - Heidegger, M. (1993). The origin of the work of Art-Basic writings. Harper Collins - Heskett, J. (2002). Design-A very short introduction. Oxford University Press. - Rapoport, A. (1969). House Form and Culture. New Jersey : Prentice Hall. - Salingaros, N. (2009). A Theory of Architecture. Umbau-Verlag. - Vitruvius, Translation: Morris, H. M. (1960). The Ten Books on Architecture	



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	Computer Aided 3D Modelling
3.	L-TS-PS Structure	0-2-0
4.	Credits/# of period	½
5.	Course number (Code)	AR204004AR
6.	Status (Core/Essential/Elective)	Essential Program Requirement (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To introduce techniques for preparing 3 dimensional models in computers. 2. To present 3 dimensional demonstration of ideas.	
10.	Course Syllabus: The course shall elaborate use of advance computers software in Architecture for preparing 3 dimensional models. The practical exercises shall be assigned to students for modelling of 3 dimensional architectural drawings. To explain the drafting process and use of software, following shall be incorporated: a. Comprehension of tools and systems for 3D modelling. b. Practice of drafting various architectural volumes, forms and surfaces. c. Conversion of 2 dimensional architectural drawings to 3 dimensional forms. The students shall prepare 3 dimensional drawings by using various software (like AutoCAD, Revit Architecture, ArchiCAD, SketchUp, 3Ds Max, etc.). Manipulation and alteration of existing architectural models through various tools and techniques shall also be incorporated. Deliverable shall be in the form of Portfolio/Sheets/Reports/Multimedia Presentation, etc.	
11.	References: i. Argelia Barcena, Revit Architecture – Fundamentals. ii. Cadfolks, AutoCAD 2019 for Beginners, iii. Murdock, K. (2015). Kelly L. Murdock's Autodesk 3ds Max 2016 Complete Reference Guide. Sdc Publications. iv. Paul, A. (2013). Renaissance Revit: Creating Classical Architecture With Modern Software. v. Wing, E. (2016). Autodesk Revit 2017 for Architecture: No Experience Required. John Wiley & Sons.	



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B.Arch Syllabus Semester-IV

1.	Department proposing the course	Architecture
2.	Course Title	Environmental Lab
3.	L-TS-PS Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	AR204005AR
6.	Status (Core/Essential/Elective)	Essential Program Requirement (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To use various tools/apparatus/equipment/software for measuring elements of climate. 2. To understand building-climate relationship.	
10.	Course Syllabus: Consideration of climatic condition and environmental factors are integral part of architectural design. Environmental lab shall impart practical training and experiments to measure different parameters of climate to infer the design requirements. The lab shall incorporate a range of experiments by using various tools/apparatus/equipment/ software. Deliverables shall be in form of climatic modelling of assignments given in Architectural Design course. Report/multi-media presentation/case study reports/models, etc.	
11.	References: i. Koenigsberger, O. H., Ingersoll, T., Mayhew, A., & Szokolay, S. V. (2010). Manual of tropical housing and building: Climatic design. Hyderabad, India: Universities Press. ii. Krishan, A. (2001). Climate responsive architecture: A design handbook for energy efficient buildings. New Delhi: Tata McGraw-Hill Publ. iii. Szokolay, S. V. (2004). Introduction to Architectural Science: The basic of sustainable design. Burlington, Architectural Press: Elsevier.	