DEPARTMENT OF ARCHITECTURE
NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR

G. E. Road, Raipur, 492010 C. G

राष्ट्रीय प्रौद्योगिकी संस्थान रायपुर,

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Phone: (0771) 2255475, Fax: (0771) 2254600, Website: www.nitrr.ac.in

B.Arch Syllabus

Semester-I

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Design-I**
3.	L-TS-PS Structure	3-3-1
4.	Credits/# of period	6/7
5.	Course number (Code)	**ARPC1111**
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 develop Basic Design Composition Skills 2. To understand Fine Arts and Art Development Process. 3. To enhance Psychomotor Skills. 4. To understand Anthropometry and Ergonomics.	
10.	Course Syllabus: All courses learnt in this semester are subservient to Architectural Design-I course. The objectives may be achieved through various exercises involving Elements, Philosophies and Principles of Design Hand-Eye Coordination, understanding of Anthropometry, Ergonomics, etc. Students are required to graphically and orally present their studies to the class, to write several short papers and a term paper that critically evaluates architectural theories/tenets/concepts. Class assignments shall be designed to enhance their listening and writing skills. The exercises shall include Basic Design 2d-3d composition, with various philosophies. Understanding Anthropometry, Ergonomics, Nature Drawings, Free Hand Sketching, etc. shall be incorporated. Basic design principles of building units like kitchen, bathroom, Water closet, toilet, bedroom, staircase, storage, etc. Deliverable 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. Lewis, D. (Ed.). (1984). Pencil drawing techniques. Watson-Guptill. iv. Neufert, E., Neufert, P., & Kister, J. (2012). Architects' data. John Wiley & Sons. v. Pandya, Y. (2007). Elements of Spacemaking. Mapin.	

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B.Arch Syllabus

Semester-I

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Graphics**
3.	L-TS-PS Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	**ARPC1112**
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 fundamentals of graphical representation in architecture. 2. To learn various angles of viewing an object and representing it architecturally. 3. To learn the concepts of various types of projections. 4. To develop skills of surface development and interpreting the illustration of architectural sections.	
10.	Course Syllabus: **Unit-1: Graphical Codes, Symbols and Scales** a. Architectural lettering b. Types of lines c. Symbolic representations of building materials d. Symbolic representations of various building parts. e. Plane, Diagonal and other Scales **Unit-2: Geometric views and Projections** a. Isometric views and projections b. Axonometric views c. Oblique views **Unit-3: Orthographic projections (One and Two Dimension)** a. Points b. Lines **Unit-4: Orthographic projections (Two and Three Dimensions)** a. Planes — Parallel, Perpendicular and inclined projections. b. Various solid and hollow geometrical objects — Parallel, Perpendicular and inclined projections. **Unit-5: Sections and Surface Development of Solids** a. Section of Solids. b. Development of surfaces with or without sections.	
11.	References: i. Bhatt, N., Ingle, P., & Panchal, V. (2008). Elementary engineering drawing (53rd ed.). Anand, Gujarat: Charotar Publishing House. ii. Ching, F. (1943). Architectural graphics (6th ed.). New Jersey: John Wiley and Sons, Inc. iii. Gill, R. W. (1984). Manual of Rendering with Pen and Ink. Thames and Hudson. iv. Lewis, D. (Ed.). (1984). Pencil drawing techniques. Watson-Guptill. v. Martin, C. (1971). Architectural graphics (2nd ed.). Taipei: Tan Chiang Book Company. vi. Morris, I., & Scott, J. (1958). Geometrical drawing for art students. London: Longmans, Green. vii. Weidhaas, E. (1980). Architectural Drafting and Design (4th ed.). Boston: Allyn and Bacon, Inc.	

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B.Arch Syllabus

Semester-I

1.	Department proposing the course	Architecture
2.	Course Title	**Pre-Historic and Ancient History of Architecture**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPC1113**
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: The First Societies** a. Development of human societies and architecture (building materials, technology and space development) during Paleolithic, Mesolithic, Neolithic and Metal Ages. b. Agricultural emergence, societal changes and change in architectural styles. **Unit-2: Vedic and Indus-Saraswati Civilizations** a. Architecture during Vedic period, development of Vedic society. b. Examples from Indus-Saraswati civilizations. **Unit-3: Egyptian Architecture – (with special emphasis on religious architecture and tombs)** **Unit-4: West Asiatic Architecture (with special emphasis on religious architecture and palaces)** a. Sumerian b. Assyrian c. Babylonian **Unit-5: Ancient Architecture of West (with special emphasis on religious architecture and palaces)** c. Cretan d. Latin American	
11.	References: i. Brown, P. (1983). Indian Architecture (Buddhist and Hindu Period). Bombay, Taraporevala and Sons. ii. Fletcher, B., & Cruickshank, D. (1996). Sir Banister Fletcher's a history of architecture. Oxford: Architectural Press. iii. Grover, S. (2003). The Architecture of India (Buddhist and Hindu Period). New Delhi, Vikas Publishing Housing Pvt. Ltd. iv. Harle, J C. (1994). The art and architecture of Indian subcontinent. Yale, Yale University press. v. Kenoyer, J. M. (1998). Ancient Cities of the Indus Valley Civilization. Karachi, Oxford University Press. vi. Kostof, S. (1985). A History of Architecture - Setting and Rituals. London, Oxford University Press. vii. Kubler, G. (1975). The Art and Architecture of Ancient America: The Mexican, Mayan, and Andean Peoples (The Pelican History of Art). Penguin Books. viii. Roth, L. M. (2007). Understanding architecture: Its elements, history, and meaning. Boulder, Colo: Westview Press. ix. Smith, W. S. (1999). The Art and Architecture of Ancient Egypt. Yale, Yale University press. x. Stierlin, H. (1977). Encyclopaedia of world architecture (Vol. 1). Macmillan. xi. Tadgell, C. (1990). The History of Architecture in India from the Dawn of civilization to the End of the Raj. London, Longmon Group U.K.Ltd.	

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B.Arch Syllabus

Semester-I

1.	Department proposing the course	Architecture
2.	Course Title	**Building Materials and Construction Techniques-I**
3.	L-TS-PS Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	**AREP1111**
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 fundamentals of building construction materials, their properties, application, components and their construction techniques. 2. To focus on various building materials, latest trends in practice and usage of new technologies/materials.	
10.	Course Syllabus: The course focuses on earth and stone 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 through measure drawings. **Unit-1: Measure drawings and Introduction to Super and Sub- Structure** a. Introduction to basic elements and components of buildings and their importance. b. Brief discussion on step wise process of building a structure. c. Basics of section of G+1 building. d. Soils – Types and Properties. **Unit 2: Basic Building Materials** a. Sand, Cement, Aggregate, Lime, Moorum, Surkhi, Fly Ash, Terracotta, Porcelain, etc. b. Bamboo and Timber. **Unit 3: Introduction to Materials of Earth Architecture** a. Use of Earth in buildings – Adobe Construction, Rammed Earth Construction, etc. b. Tiles – Types, Uses, etc. c. Bricks – Types, Class, Uses, etc. d. Mortars –Mud **Unit 4: Brick Masonry** a. Brick Walls and Bonds – Header, Stretcher, English, Flemish, Rat-Tap, Silver Lock, etc. b. Brick Foundations, Piers and Thresholds. c. Brick Lintels, Arches and Vaults. d. Jointing, Pointing, etc. e. Cement, Lime, **Unit 5: Stone Masonry** a. Stone Walls – Rubble, Random Rubble, Course, etc. b. Stone Foundations and Thresholds. c. Stone Arches, and Vaults. *Note: Deliverable shall be in form of portfolio/sheets/models/reports/multi-media presentations, etc. with hands-on experience.*	
11.	References: i. Barry, R. (1999). The Construction of Buildings Series. 5th Ed. New Delhi: East-West Press. ii. Ching D.K. (2014). Building Construction Illustrated. 5th Ed. NJ: John Wiley and Sons iii. Chudley, R. (2008). Building Construction Handbook. 7th Ed. London: Butterworth-Heinemann. iv. Foster, J. and Mitchell, S. (1963). Building Construction: Elementary and Advanced, 17th Ed. London: B.T. Batsford Ltd. v. McKay, W. B. (2005). Building Construction Metric Series. I–V. Mumbai: Orient Longman. i. Moxley, R. (1961). Mitchell's Elementary Building Construction. London: B. T. Batsford. vi. Punmia, B.C. and Jain, A. K. (2016). Building Construction. 11th Ed. New Delhi: Laxmi Publications. vii. Rangwala, S. C. (2017). Engineering Materials: Material Science. 43rd Ed. Anand: Charotar Publishing House Pvt. Ltd. viii. Rangwala, S. C. (2019). Building Construction 33rd Ed. Anand: Charotar Publishing House Pvt. Ltd. ix. Sushil-Kumar, T. B. (2003). Building Construction. 19th Ed. Delhi: Standard Publishers.	

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B.Arch Syllabus

Semester-I

1.	Department proposing the course	Architecture
2.	Course Title	**Structure, Form and Architecture**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP1112**
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 understand the basic theories of structures in Architecture 2. To get acquainted with the basic terminologies of structure. 3. To understand the basic systems of structures and structural elements.	
10.	Course Syllabus: **Unit-1: The basics of structures and loads (by various architectural examples).** a. Understanding structural systems and functions, basic concepts of various types of loads that results in determining the structural systems. b. The use of various materials that play a role in determining the structural systems. **Unit-2: The basics of beams and columns (by various architectural examples).** a. Concepts on Newton's Laws, Stress and Strain, Transitional Equilibrium, Rotational equilibrium, Beam actions, Shear, Bending and Bulking, Moments. **Unit-3: Form Resistant structures (by various architectural examples).** a. Strength through forms, Grids and Flat slabs b. Curved surfaces, Barrel roof and folded plates c. Saddle roof and Complex roofs. **Unit-4: Structures and Architecture – semiotic relations. (by various architectural examples).** a. Role of structural systems in development of aesthetics in architecture. b. Role of aesthetics in architecture in development of structural systems. **Unit-5: Structural failures (by various architectural examples).** a. Types of Structural failures b. Reasons of Structural failures, c. Preventive Measures.	
11.	References: i. Brown, P. (1983), Indian Architecture (Buddhist and Hindu Period), Taraporevala and Sons, Bombay, 1983. ii. Levy, M., & Salvadori, M. (2002). Why buildings fall down: How structures fail. WW Norton & Company. iii. National Building Code of India 2016 (2016 ed., Vol. 1, SP 7). (2016). New Delhi: Bureau of Indian Standards. iv. Salvadori, M. (1990). Why buildings stand up: The strength of architecture. WW Norton & Company.Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press, London, 1985.	

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B.Arch Syllabus

Semester-I

1.	Department proposing the course	Architecture
2.	Course Title	**Ecology and Environmental Science**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP1113**
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 create awareness among students regarding development of harmony with ecosystem.
2. To acquaint the students about the environment and its effect on human and vice-verve.
3. To generate awareness towards Eco-friendly Architecture.

10. Course Syllabus:

Unit-1 Fundamentals of Environment & Ecology

c. Fundamentals and Components of ecology and ecosystem.
d. Food chain, food web, tropic levels, energy flow, cycling of nutrients, habitat and niche.
e. Introduction, types, characteristic features, structure and function of different ecosystems.
f. Effects of human activities on environment.

Unit-2 Water pollution

a. Hydrosphere, sources of water and water pollution.
b. Classification of water pollutants, trace elements, contamination of water.
c. Sources and effects of water pollution, types of pollutants, eutrophication.
d. Pollution, determination measurement systems and agencies, acts related to water pollution.
e. Methods and equipment used in waste water treatment.
f. Architectural measures for reducing water pollution.

Unit-3 Air pollution

a. Atmospheric composition and Air Pollution – Classification and sources.
b. Effect of pollutants.
c. Ambient air quality standards, measurement systems and agencies, acts related to air pollution.
d. Architectural measures for reducing air pollution

Unit-4 Land and noise pollution

a. Lithosphere and Land Pollution.
b. Pollutants — origin and effects.
c. Solid Waste — Collection, management and disposal techniques.
d. Noise pollution - definitions and causes.
e. Sources, effects, standards and control measures.
f. Measurement systems and agencies, acts related to land and noise pollution.
g. Architectural measures for reducing land and noise pollution.

Unit-5 Ecology and Architecture

a. Urban ecosystem and rural ecosystems
b. Inter-relationship of man-made development with eco-processes.
c. Eco-friendly — materials, energy systems, architectural examples, etc.

11. References:

i. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai,
ii. Hawkins.R.E, Encyclopedia of Indian Natural History, Bombay Natural History Sdociety, Bombay (R).
iii. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assesment. Cambridge Univ. Press.
iv. McKinney, M.L & Schoch, R.M. 1996. Environmental Science System & Solutions, Web enhanced edition.
v. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)
vi. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R).

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B.Arch Syllabus

Semester-I

1.	Department proposing the course	Architecture
2.	Course Title	**Carpentry and Metal Workshop**
3.	L-TS-PS Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**AREP1121**
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 equip students with working knowledge of various machines and tools. 2. To understand the possibilities and restriction of working with machines. 3. To learn techniques of various workshop practices.	
10.	Course Syllabus: The course shall encompass introduction to carpentry, wood working machines, and its uses, various joineries, sawing, planning and Shaping of wood, making of selected joinery used in construction work, polishing of wood, etc. Demonstration and practical lesson on soldering, brazing, forging and gas welding. Introduction to molder's tools, preparation of moulding clay/sand, cutting and drilling, grinding and slotting, shaping and bending, etc. shall be incorporated. Deliverable shall be in form of practical models/ workshop reports/ lab file, etc.	
11.	References: i. Beech, R. (1995). Discover Origami: 40 original projects to build your paper crafting skills. Hamlyn. ii. Kato, D. (2006). The Art of Polymer Clay: Designs and Techniques for Creating Jewelry, Pottery, and Decorative Artwork. Clarkson Potter. iii. McCreight, T., & Bsullak, N. (2001). Color on Metal: 50 Artists Share Insights and Techniques. Guild. iv. Stanyer, P. (2003). The Complete Book of Drawing Techniques: A Professional Guide for the Artist. Arcturus.	

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B.Arch Syllabus

Semester-I

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Appreciation**
3.	L-TS-PS Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**AREP1122**
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 help students identify and appreciate Architecture as an outcome of socio-cultural processes. 2. To promote the visual literacy level and prepare to appreciate the aesthetic components of art and architecture. 3. To analyze architectural grammar, styles and practices in various cultural settings.	
10.	Course Syllabus: **Unit-1 Vocabulary of Fine Arts** a. Identifying and understanding elements of fine arts. b. Colour Theory and Psychology of colour. **Unit-2 Generating the sense** a. Degree of enclosure. b. Volume and Space. c. Relationship of mass and void. **Unit-3 Architecture and People** a. Appreciation of architecture. b. Elements of Space and its impact. c. Elements of surprise, safety, privacy, etc. **Unit-4 Visual Literacy** a. Understanding the relevance of symbols and images in architecture. b. Various tools and techniques of analyzing and appreciating.	
11.	References: i. Byrne, K. (2006). William Lidwell, Kritina Holden and Jill Butler. Universal Principles of Design: 100 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach Through Design. Information Design Journal, 14(2), 185-186. ii. Catanese, A. J., & Snyder, J. C. (Eds.). (1979). Introduction to architecture. McGraw-Hill. iii. Ching, F. D. (2011). A visual dictionary of architecture. John Wiley & Sons.John Berger, Ways of Seeing iv. Ching, F. D. (2014). Architecture: Form, space, and order. John Wiley & Sons. v. Grabow, S., & Spreckelmeyer, K. (2014). The architecture of use: aesthetics and function in architectural design. Routledge. vi. Norman, D. A. (1990). The design of everyday things. New York: Doubleday Emily Cole, vii. Pallasmaa, J. (2012). The eyes of the skin: Architecture and the senses. John Wiley & Sons. viii. Rapoport, A. (1969). House form and culture. Englewood Cliffs, N.J: Prentice-Hall.	

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B.Arch Syllabus

Semester-II

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Design-II**
3.	L-T-P Structure	3-3-1
4.	Credits/# of period	6/7
5.	Course number (Code)	**ARPC1211**
6.	Status (Core/Essential/Elective)	Professional Core (PC)
7.	Pre-requisites (course no./title)	ARPC1111-Architectural Design-I
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To implement concepts of architectural pricnciples. 2. To understand different Architectural Philosophies through the works done by eminent Architects. 3. To understand Architectural Contextualism.	
10.	Course Syllabus: All courses learnt in this semester and in previous semester are subservient to Architectural Design-II course. The course shall initiate with an Educational Tour accompanied by 1 teacher per 20 students (approx.) for understanding various Architectural Principles, Compositions and Contextualism. The lessons learnt from educational tour shall be submitted in form of Tour Report and learning shall be implemented in further design problems. Students shall be encouraged to be critical and to look for alternate descriptions and explanations of architecture. They shall critically evaluate user, Context and combination of user and context. and develop their own perceptions through discussions and writing. There shall be at least two design problems during this course to achieve the objectives stated hereabove. This may be done through designing small built-forms emphasizing on development of forms and interaction between Form and Space. The suggestive design topics may include 2 to 3 spaces *viz.* small house, night shelter, small office, kiosk, shop, bus stop, gate, clinic, saloon, pavilion, etc. Deliverable shall be in the form of Portfolio/Sheets/Models/Reports/Multimedia 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. Neufert, E., Neufert, P., & Kister, J. (2012). Architects' data. John Wiley & Sons.	

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B.Arch Syllabus

Semester-II

1.	Department proposing the course	Architecture
2.	Course Title	**Perspective and Sciography**
3.	L-TS-PS Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	**ARPC1212**
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 geometry behind various viewing angles and dimensions. 2. To develop better skills of graphical representations.	
10.	Course Syllabus: **Unit-1: Perspective Drawings -I** a. Introduction to basic terms, principles, types and techniques of perspective drawings for expression of ideas. b. Two-point perspective of simple geometrical objects. c. One-point perspective of simple geometrical objects. **Unit-2: Perspective Drawings –II** a. Two-point perspective of complex geometrical objects and buildings b. One-point perspective of complex geometrical objects and building interiors/ exteriors. c. Multiple point perspectives. **Unit-3: Freehand Perspective Drawings** a. Freehand perspective drawings with various techniques **Unit-4: Sciography-I** a. Introduction to basic principles of Sciography and its application on two dimensional objects in plans and elevations. b. Sciography of three-dimensional objects in plan, elevations and views. **Unit-5: Sciography-II** a. Sciography of simple building elements. b. Various methods of Sciography in 3D form of simple geometrical objects. c. Sciography in Perspective view of complex objects.	
11.	References: i. Ching, F. (1943). Architectural graphics (6th ed.). New Jersey, John Wiley and Sons, Inc. ii. Dinsmore, G. (1968). Analytical graphics. Princeton, D. Van Nostrand Co. iii. Gill, R. (1991). Basic perspective. London, Thames and Hudson. iv. Gill, R. (2006). Perspective (1st ed.). London, Thames and Hudson. v. Graphic-Sha Staff. (1987). Interiors: Perspectives in Architectural Design/Included, An Actual CG Perspective. Tokyo, Japan: Books Nippan. vi. Holmes, J. (1954). Applied perspective. London, I. Pitman. vii. Lockard, W. (1994). Drawing as a means to architecture. Menlo Park, CA, Crisp Publications. viii. Martin, C. (1971). Architectural graphics (2nd ed.). Taipei, Tan Chiang Book Company. ix. Mulik, M. (2006). Perspective. India, Jyotsna Prakashan. x. Mulik, S. (1994). Textbook of Perspective and Sciography. India, Allied Publications Pvt. Ltd. xi. Norling, E. (1998). Perspective drawing. Tustin, CA, Walter Foster Pub.	

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B.Arch Syllabus

Semester-II

1.	Department proposing the course	Architecture
2.	Course Title	**History of European Architecture**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPC1213**
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 early European 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: Greek Architecture (with special emphasis on religious architecture, public buildings, orders and visual corrections)** **Unit-2: Roman Architecture (with special emphasis on religious architecture, public buildings, and construction techniques)** **Unit-3: Christian Architecture (with special emphasis on religious architecture and construction techniques)** a. Early Christian b. Byzantine **Unit-4: Romanesque and Gothic (with special emphasis on religious architecture and construction techniques)** **Unit-5: Renaissance Architecture (with special emphasis on religious architecture)** a. Italian b. French	
11.	References: i. Burckhardt, J. (1987). The Architecture of the Italian Renaissance. Chicago, University of Chicago Press ii. Fletcher, B., & Cruickshank, D. (1996). Sir Banister Fletcher's a history of architecture. Oxford: Architectural Press. iii. Frankl, P. (2001). Gothic Architecture. Yale, The Yale University Press. iv. Kostof, S. (1985). A History of Architecture - Setting and Rituals. London, Oxford University Press. v. Robertson, D. S. (1969). Greek and Roman architecture. London, Cambridge University Press. vi. Roth, L. M. (2007). Understanding architecture: Its elements, history, and meaning. Boulder, Colo: Westview Press. vii. Yarwood, D. (1988). A Chronology of Western Architecture. Dover Publications Inc.	

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B.Arch Syllabus

Semester-II

1.	Department proposing the course	Architecture
2.	Course Title	**Building Materials and Construction Techniques-II**
3.	L-TS-PS Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	**AREP1211**
6.	Status (Core/Essential/Elective)	Essential Program Requirement (EPR)
7.	Pre-requisites (course no./title)	AREP1111-Building Materials and Construction Techniques-I
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To introduce wood as a building material. 2. To create an understanding of timber joineries in various wooden components of buildings. 3. To introduce all types of wooden doors, windows, flooring, paneling, roofing, trusses, etc.	
10.	Course Syllabus: The course focuses on wood as a building material. 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 Wood as building material** a. Wood – Types, Seasoning, Defects, Testing, etc. b. Components made up of wood and wood composites. **Unit 2: Wooden Doors and Windows** a. Doors – Types, Shutters, Frames and Components, Joinery details, Fitting and Fixtures, etc. b. Window – Types, Shutters, Frames and Components, Joinery details, Fittings and Fixtures, etc. c. Louvers, Ventilators, Fan-light, etc. **Unit 3: Wooden Flooring and Paneling** a. Flooring – Types, Uses, Construction Techniques and Finishes, etc. b. Wall Paneling – Types, Uses, Frame and Fixing Details, Laminates, etc. c. Jamb, Lintel, Sill Casings, etc. **Unit 4: Wooden Staircase, Railings and Posts** a. Staircase – Types, Risers, Treads, Nosing, Stringer, etc. b. Railings – Types, Newel Post, Baluster, Handrail, etc. c. Posts – Types, Uses, Components, Joinery details, Fixing details, etc. **Unit 5: Wooden Trusses and Roofs** a. Roofs – Types, Uses, Joinery details, Fixing and Finishes, Water Proofing, etc. b. Truss – Types, Uses, Joinery details, etc. c. Purlins, Gutters, Rafters, Ridge, Eve, Covering Materials (like Sheets, Tiles, Slates), etc. *Note: Deliverable shall be in form of portfolio/sheets/models/reports/multi-media presentations, etc.*	
11.	References: i. Barry, R. (1999). The Construction of Buildings Series. 5th Ed. New Delhi: East-West Press. ii. Ching, F.D.K. (2014). Building Construction Illustrated. 5th Ed. New Jersey, John Wiley and Sons. iii. Chudley, R. (2008). Building Construction Handbook. 7th Ed. London, Butterworth-Heinemann. iv. Duggal, S. K. (2017). Building materials. Routledge. v. Foster, J. and Mitchell, S. (1963). Building Construction: Elementary and Advanced, 17th Ed. London: B.T. Batsford Ltd. vi. Kumar, S. (2003). Building Construction. 19th Ed. Delhi, Standard Publishers. vii. McKay, W. B. (2005). Building Construction Metric Series, I-V. 4th Ed. Mumbai: Orient Longman. viii. Moxley, R. (1961). Mitchell's Elementary Building Construction. London, B. T. Batsford. ix. Punmia, B.C. and Jain, A. K. (2016). Building Construction. 11th Ed. New Delhi, Laxmi Publications. x. Rangwala, S. C. (2017). Engineering Materials: Material Science. 43rd Ed. Anand, Charotar Publishing House Ltd. xi. Rangwala, S. C. (2019). Building Construction 33rd Ed. Anand, Charotar Publishing House Pvt. Ltd.	

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B.Arch Syllabus

Semester-II

1.	Department proposing the course	Architecture
2.	Course Title	**Mechanics of Solids**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP1212**
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 understand various principles of strength of materials. 2. To introduce a design process to provide a combination of component with different variety of factors. 3. To outline the relationship between the bending to the material property and geometry.	
10.	Course Syllabus: **Unit-: Introduction to Beam and its properties** a. Elasticity, Stress and Strain, Deformation of beam, Centroid and Center of Gravity, Moment of Inertia, Theorems of M.I. of Parallel and Perpendicular axes, b. Force- Causes and Effects, Force through vector, Coplanar, Concurrent, Non-concurrent forces, Triangle of forces, Parallelogram of forces and Conditions of Equilibrium, Moments, Moment of forces, Moment of couples and Static equilibrium of rigid bodies. **Unit-2: Shear Force and Bending Moment** a. Beams and support conditions - Types, Shear force and Bending moment diagram, Cantilevers, and Overhanging beams with concentrated, uniformly distributed and uniformly varying loads. b. Bending and Shearing Stresses**,** Theory of Bending, Distribution of stress in beams. **Unit-3: Deflection of Beams** a. Differential equation of the elastic curve, Double integration method, Area moment theorems. b. Applications to simply supported, cantilever and overhanging beams. c. Strain energy for axial load and bending, Castigliano's theorems and applications. **Unit-4: Trusses** a. Statically determinate plane trusses, Perfect and Imperfect frames, Deficient and Redundant frames. b. Analytical methods for finding out the forces, Method of joints and Method of sections, Deflection of Truss joints. **Unit-5: Introduction to Statically Indeterminate structures** a. Statically Indeterminate structures, Redundancy, Degree of Indeterminacy of Beams, Frames and Truss. b. Method of Consistent Deformation, Three Moment Method, Slope Deflection Method and Moment Distribution Method, Fixed end moments of beams with concentrated, uniformly distributed loads and moments.	
11.	References: i. Beer, F. P., & Johnson Jr, E. R. (1997). Vector Mechanics for Engineers, Vol. 1 Statics and Vol. 2 Dynamics.Merium and Kraig; 'Engineering Mechanic' ii. Neal, B. G. The plastic methods of structural analysis 1963. iii. Prasad, P. and King, A. I. (1974). An experimentally validated dynamic model of the spine. Journal of Applied Mechanics, 41(3), 546-550. iv. Punmia, B. C. (2004). *SMTS-II Theory of Structures*. Firewall Media. v. Rajasekaran, S. (2009). Engineering Mechanics: Statics and Dynamics. Vikas Publishing House. vi. Rajput, R. K. (2008). Strength of materials. S. Chand. vii. Ramamrutham, S., & Narayanan, R. (1999). Elements of Strength of Materials. Dhanpat Rai Publishing Company (P) Ltd. viii. Shames, I. H. (1966). Engineering mechanics: dynamics (Vol. 2). Prentice-Hall. ix. Tayal, A. K. (2009). Engineering Mechanics. Umesh Publications. x. Timoshenko, S. P. and Young, D. H.; 'Elements of Strength of Materials'; 5th edition, East West Press, 1993 Timoshenko, S.; 'Strength of Material'; Tata McGraw Hill, New Delhi. xi. Wang, C. K. and Saunders, H. (1986). Intermediate structural analysis.	

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B.Arch Syllabus

Semester-II

1.	Department proposing the course	Architecture
2.	Course Title	**Surveying and Leveling**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP1213**
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 interpret the booking for field notes. 2. To apply the fundamental of chain and compass surveying for field survey. 3. To work out the contour surveying with the help of levelling instrument. 4. To determine the triangulation with the help of Theodolite. 5. To define and classify the various types of modern survey.	
10.	Course Syllabus: **Unit-1: Chain Surveying** a. Principles of Survey, equipment required, selection of station, methods of taking off sets. Booking the field notes, obstacles in chaining, errors in chaining, chaining on sloping ground and reciprocal ranging. b. Compass Surveying- The prismatic compass; its construction and uses. Other types of compasses. Reduced and whole circle bearing, magnetic declination, effects local attraction. Compass traverse and balancing the closing error. **Unit-2: Levelling** a. Different types of levels, their temporary and permanent adjustment levelling staff. Book of the readings and reduction of levels, errors in levelling. b. Curvature and refraction reciprocal levelling profile, levelling cross sections. c. Theodolite Surveying - Theodolite its temporary and permanent adjustment measuring of magnetic bearings, horizontal and vertical angles. Theodolite traverse and balancing the closing error. **Unit-3: Plane table Survey and Contouring** a. Equipment and methods of plane table survey. Two points and three points problems. b. Characteristics of contour lines, direct and indirect methods of contouring, interpolation of contours. **Unit-4: Introduction to modern surveying equipment** a. Total Station, GPS, Use of Distomat and Theomat, Aerial Photography, b. Digital Levels and Auto-Levels. (Preliminary information and use). c. Minor Instruments –Hand level, Abney level, Tangent Clinometer, Sextant and Pantograph. **Unit-5: Construction Surveying** a. Introduction, Equipment for setting out, Horizontal and vertical control, b. Setting out a pipe line, Setting out a building and structure (complete layout).	
11.	References: i. De Chiara, J., & Koppelman, L. (1969). Planning Design Criteria. Van Nostrand Reinhold Company. ii. Development Control Rules – CMDA. iii. Lynch, K., Lynch, K. R., & Hack, G. (1984). Site planning. MIT press. iv. Punmia, B. C., Jain, A. K., & Jain, A. K. (2005). Surveying Vol. I & II. v. Shahani, P. B., & Shahani, P. B. (1969). Advanced Surveying. Oxford and IBH. vi. Strom, S., Nathan, K., & Woland, J. (2013). Site engineering for landscape architects. John Wiley & Sons.	

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B.Arch Syllabus

Semester-II

1.	Department proposing the course	Architecture
2.	Course Title	**Model Making Workshop**
3.	L-TS-PS Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**AREP1221**
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 learn model making by using tools and techniques necessary to demonstrate ideas and designs in 3-Dimensional form.	
10.	Course Syllabus: Creation of a model inculcate problem solving, experimentation, innovation and implementation ability fostering individual skills, processes, techniques and creative power. The course activities focus on both exquisite craft, and rapid modeling. It facilitates tools and environment for model making techniques of varying resolution, and the appropriateness of each to mark their presence in professional practice. Assignments shall vary in focus from skill and execution to iteration and experimentation. The deliverable shall be in form of 3D-models as an output of model making exercises of the assignments given to students in other courses during the semester, like History of Architecture. The exercises shall incorporate use of different tools, techniques and materials to prepare 3D models.	
11.	References: i. Beech, R. (1995). Discover Origami: 40 original projects to build your paper crafting skills. Hamlyn. ii. Kato, D. (2006). The Art of Polymer Clay: Designs and Techniques for Creating Jewelry, Pottery, and Decorative Artwork. Clarkson Potter. iii. McCreight, T., & Bsullak, N. (2001). Color on Metal: 50 Artists Share Insights and Techniques. Guild. iv. Stanyer, P. (2003). The Complete Book of Drawing Techniques: A Professional Guide for the Artist. Arcturus.	

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B.Arch Syllabus

Semester-II

1.	Department proposing the course	Architecture
2.	Course Title	**Vernacular Architecture**
3.	L-TS-PS Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**AREP1222**
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 know all dimensions of architectural practice to build judiciously and be able to practice in a more cost effective, ecologically sensible and culturally relevant way. 2. To identify and learn the different materials and techniques of construction in Vernacular Practices	
10.	Course Syllabus: The objective may be achieved through measure drawings and documentations of various case studies. **Unit-1: Introduction of Vernacular Architecture** a. Definition and characteristics of Vernacular Architecture. b. Differentiating Vernacular Architecture from Traditional Architecture. c. Scope of Vernacular Architecture. d. Evolution of Vernacular Architecture Theories. **Unit-2: Factors Influencing Vernacular Architecture** a. Need, benefits and importance b. Vernacular and Environment c. Physical, social, climatic, etc. factors influencing, **Unit-3: International case studies** a. Settlement Pattern, Built form and Symbolism b. Typical features, materials and techniques c. Impacts of social, physical, technological and environmental factors. **Unit-4: Indian case studies** a. Settlement Pattern, Built form and Symbolism b. Typical features, materials and techniques c. Impacts of social, physical, technological and environmental factors. **Unit-5: Implementation of Vernacular Architecture** a. Vernacular Architecture in contemporary practices. b. Works of various architects, etc.	
11.	References: i. Brunskill, R. W. (2000). Vernacular Architecture: An Illustrated Handbook. London, Faber. ii. Koenigshberger, O. H., Ingersoll, T., Mayhew, A., & Szokolay, S. V. (2010). Manual of tropical housing and building: Climatic design. Hyderabad, India: Universities Press. iii. Oliver, P. (1998). Encyclopedia of Vernacular Architecture of the World. Cambridge, Cambridge Univ. Press. iv. Rudofsky, B. (1987). Architecture without architects: a short introduction to non-pedigreed architecture. UNM Press. v. Thapar, B. (2012). Introduction to Indian Architecture. Tuttle Publishing. vi. Tipnis, A. (2012). Vernacular traditions: Contemporary architecture. The Energy and Resources Institute (TERI).	

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B.Arch Syllabus

Semester-III

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Design-III**
3.	L-TS-PS Structure	3-3-1
4.	Credits/# of period	6/7
5.	Course number (Code)	**AR203101AR**
6.	Status (Core/Essential/Elective)	Professional Core (PC)
7.	Pre-requisites (course no./title)	ARPC1211-Architectural Design-II
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand Site, Contours, Natural Features and Vernacular Practices. 2. To understand Cultural Influences in Architecture. 3. To adapt lessons learnt from Architectural History in design development. 4. To develop forms through space-making and their interrelationship.	
10.	Course Syllabus: All courses learnt in this semester and in all previous semesters are subservient to Architectural Design-III course. Projects shall be dealt through collecting information, critical evaluation, and representation through literary and visual resources. There shall be at least two design problems during this course to achieve the objectives stated here above. This may be done through designing built-forms emphasizing on Development of Forms and interaction between Form and Space. The design shall encompass local contexts, handling contours/site features/vernacular practices. The suggestive design topics may include 5 to 8 spaces *viz.* bungalows, farm house, office/residence of professionals, cafe and restaurant, dispensary, primary health care center, fuel station, creche, play school, kindergarten, post office, bank etc. Deliverable shall be in the form of Portfolio/Sheets/Models/Reports/Multimedia 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. Neufert, E., Neufert, P., & Kister, J. (2012). Architects' data. John Wiley & Sons.	

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B.Arch Syllabus
Semester-III

1.	Department proposing the course	Architecture
2.	Course Title	**History of Hindu, Buddhist and Jain Architecture**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AR203102AR**
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 Philosophical Principle in Hindu, Buddhist and Jain 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: Temple Architecture in North and West India** a. Philosophical Principles b. Examples of North and West Indian Temples **Unit-2: Temple Architecture in East and central India** a. Philosophical Principles b. Examples of East and central Indian Temple **Unit-3: Temple Architecture in South India** a. Philosophical Principles b. Examples of South Indian Temples **Unit-4: Buddhist and Jain Architecture (with special emphasis on religious architecture and Public Buildings)** a. Philosophical Principles of Buddhist and Jain Architecture b. Development of Buddhist and Jain Architecture in North, East South West and Central c. Examples and influences. **Unit-5: Hindu, Buddhist and Jain Architecture in neighboring countries (with special emphasis on religious architecture)** a. China, Japan, b. SE Asia, c. Afghanistan etc.	
11.	References: i. Brown, P. (1983). Indian Architecture (Buddhist and Hindu Period). Bombay, Taraporevala and Sons. ii. Fletcher, B., & Cruickshank, D. (1996). Sir Banister Fletcher's a history of architecture. Oxford: Architectural Press. iii. Grover, S. (2003). The Architecture of India (Buddhist and Hindu Period). New Delhi, Vikas Publishing Housing Pvt. Ltd. iv. Handa, O.C. (2002). Temple Architecture of the Western Himalaya: Wooden Temples. New Delhi, Indus Publishing Company. v. Hardy, A. (2007). The Temple Architecture of India. John Wiley & Sons. vi. Harle, J C. (1994). The art and architecture of Indian subcontinent. Yale, Yale University press. vii. Kostof, S. (1985). A History of Architecture - Setting and Rituals. London, Oxford University Press. viii. Michell, G. (1986-2001) Encyclopaedia of Indian Temple Architecture North and South India in Seven volumes (Set of 14 Books). UK, Manohar Publishers and Distributors. ix. Michell, G. (1988). The Hindu temple: an introduction to its meaning and forms. Chicago, University of Chicago Press. x. Nagach, B.L., Suresh, K.M. and Sharma, D. P. (2009). Encyclopedia of Indian Architecture: Hindu, Buddhist, Jain and Islamic. Delhi, Bharatiya Kala Prakashan. xi. Pandya, Y. (2013). Concepts of Space in Traditional Indian Architecture. Grantha Corporation. xii. Roth, L. M. (2007). Understanding architecture: Its elements, history, and meaning. Boulder, Colo: Westview Press. xiii. Sahai, S. (2008). Forts & Palaces of India. Delhi, Prakash Books. xiv. Stierlin, H. (1977). Encyclopaedia of world architecture (Vol. 1). Macmillan. xv. Tadgell, C. (1990). The History of Architecture in India from the Dawn of civilization to the End of the Raj. London, Longmon Group U.K.Ltd.	

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B.Arch Syllabus

Semester-III

1.	Department proposing the course	Architecture
2.	Course Title	**Building Materials and Construction Techniques-III**
3.	L-TS-PS Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	**AR203001AR**
6.	Status (Core/Essential/Elective)	Essential Program Requirement (EPR)
7.	Pre-requisites (course no./title)	AREP1211-Building Materials and Construction Techniques-II
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To introduce glass, metal and PVC as building materials. 2. To understand various building components made up of glass, metals and PVC and their application techniques. 3. To introduce concepts of scaffolding, underpinning and form-work.	
10.	Course Syllabus: The course focuses on glass, metal and PVC 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 Glass, Metal (Steel and Aluminium), PVC as building materials** a. Glass – Types, Properties, Uses, Fixing details, etc. b. Steel – Types, Properties, Uses, Fixing Details, etc. c. Aluminium – Types, Properties, Uses, Fixing Details, etc. d. PVC – Types, Properties, Uses, Fixing Details, etc. **Unit 2: Doors, Windows and Glazing** a. Doors – Glass, Aluminium, Steel, PVC, Composite, etc. b. Windows – Glass, Aluminium, Steel, PVC, Composite, etc. c. Glazing – Types, Uses, Components, Fixing details, etc. **Unit 3: Partitions, False Ceilings and Flooring** a. Partitions – Glass, Aluminium, Steel, PVC, Composite, etc. b. False Ceiling – Types, Uses, Components, Fittings and Fixtures, Finishes, etc. c. Flooring – Types, Uses, False Flooring, Components, Fittings and Fixtures, Finishes, etc. **Unit 4: Paneling, Cladding** a. Paneling – Types based on various materials (Glass, Aluminium, Composite, etc.), Components, Finishes. b. Cladding – Types based on various materials (Glass, Aluminium, Composite, etc.), Components, Finishes. **Unit 5: Glazing and Curtain Walls** a. Types, Uses, Components, Fixing details, etc. *Note: Deliverable shall be in form of portfolio/sheets/models/reports/multi-media presentations, etc. with hands-on experience.*	
11.	References: i. Barry, R. (1999). The Construction of Buildings Series. 5th Ed. New Delhi: East-West Press. ii. Ching F.D.K. (2014). Building Construction Illustrated. 5th Ed. NJ: John Wiley and Sons iii. Chudley, R. (2008). Building Construction Handbook. 7th Ed. London: Butterworth-Heinemann. iv. Foster, J. and Mitchell, S. (1963). Building Construction: Elementary and Advanced, 17th Ed. London: B.T. Batsford Ltd. v. Hailey and Hancork, D. W. (1979). Brick Work and Associated Studies Vol. II. London: MacMillan. vi. McKay, W. B. (2005). Building Construction Metric Vol. I–IV. 4th Ed. Mumbai: Orient Longman. vii. Moxley, R. (1961). Mitchell's Elementary Building Construction. London: B. T. Batsford. 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. x. Rangwala, S. C. (2019). Building Construction 33rd Ed. Anand: Charotar Publishing House Pvt. Ltd. xi. Sushil-Kumar, T. B. (2003). Building Construction. 19th Ed. Delhi: Standard Publishers.	

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B.Arch Syllabus

Semester-III

1.	Department proposing the course	Architecture
2.	Course Title	**Mechanics of Structures**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AR203002AR**
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 understand the theories of column, arches and their applications. 2. To understand load bearing masonry structure and its application.	
10.	Course Syllabus: **Unit-1: Columns** a. Theory of columns, Types of end conditions, Equivalent length, Axial loads. b. Combined bending and axial loads, Indian Standard Code recommendations. c. Euler's formula for long columns, Rankine's formula, Practical applications. **Unit-2: Arches** a. Theory of arches, classification of arches, Analysis of three hinged and two hinged arches. b. Bending moment diagram for given loads, Normal thrust and radial shear. **Unit-3: Introduction to Load Bearing structures** a. Basic terminology, Design considerations, Scope, Materials, Supports and Stability. b. Effective dimension of wall, column, foundation and openings, Eccentricity and Slenderness ratio. **Unit-4: Structural Design of Load Bearing structures** a. Masonry properties and Codes of practice for Structural Masonry. b. Lateral load analysis, Design of wall and column for different types of loading systems. **Unit-5: Methods of Construction** a. Types, Workmanship, Joints to control deformation and cracking. b. Corbelling. Design calculations for Residential building according to BS 5628.	
11.	References: i. B., J. S., & B., J. S. (n.d.). Mechanics of structure. Bombay: Vivele Pub., 2011. ii. BS 5628-3. (2005). Code of practice for the use of masonry. Materials and components, design and workmanship, GoI. iii. Khurmi, R. S. (2007). A Textbook of Engineering Mechanics (SI Units). S. Chand. iv. Punmia, B. C. (1984). Strength of materials and mechanics of structures. Delhi: Standard Pub Dist. v. Reddy, C. S. (2011). Basic structural analysis. Tata McGraw-Hill Education. vi. Vazirani, V. N., & Ratwani, M. M. (1996). Analysis of Structures. Textbook for Engineering Students. vii. Punmia, B. C. (2004). SMTS-II Theory of Structures. Firewall Media. viii. Bhavikatti, S. S. (2005). Structural Analysis-I. Vikas Publishing House. ix. Bhavikatti, S. S. (2016). Structural Analysis-II. Vikas Publishing House. x. Hendry, A. W., Sinha, B. P., & Davies, S. R. (2003). Design of masonry structures. CRC Press. xi. Rai, D. C. (2005). Structural use of unreinforced masonry. IITK-GSDMA EQ, 12, 19. xii. Curtin, W. G. (1983). Loadbearing Brickwork Crosswall Construction. Brick Development Association Publication,(Apr.), 1983.	

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B.Arch Syllabus

Semester-III

1.	Department proposing the course	Architecture
2.	Course Title	**Water Supply and Sanitation Building Services**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AR203003AR**
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 understand need and importance of water supply and sanitation. 2. To study water supply system in buildings. 3. To understand components of various sewage systems. 4. To study and understand solid waste management system.	
10.	Course Syllabus: **Unit-1: Water Supply-I** a. Sources, Quantity and Quality of potable water. b. Water demand calculations, norms and standards. c. Water treatment for domestic purpose, etc. a. Run-off calculation, Rain water harvesting system, Recycling of water, etc. **Unit-2: Water Supply-II** a. Water storage, overhead tank, sump, etc. b. Water distribution systems. c. Guidelines for laying of water supply lines. d. Water supply pipe materials, apparatus, joints, fixtures and valves., etc. **Unit-3: Sanitation-I** a. Basic principles and standards of sanitation. b. Modern plumbing system. c. Types of pipe systems, Types of traps and their uses. d. Types of sanitary systems and network. **Unit-4: Sanitation-II** a. Gully trap, inspection chamber, intercepting trap, grease trap, man holes, etc. b. Calculation for Gradient and slope in sewage disposal. c. Various sanitary fixtures,fittings and its connections. d. Sewage disposal to septic tank, cess pool, soak pit, etc. e. Connection of building/campus drainage to public sewer. **Unit-5: Solid waste Management** a. Introduction to Solid waste and its management. b. Placement of refuse chute, collection points, etc. c. Storm water disposal at site and settlement level.	
11.	References: i. Birdie, G. S., & Birdie, J. S. (2013). Water Supply and Sanitary Engineering (including Environmental Engineering and Pollution control Acts). ii. G.M. Fair, J.C.Geyer & D.Okin, Water and Waste water engineering Vol II, John Wiley & Sons, Inc. N Y, 1968 iii. Husain, S. K. (1974). Water supply and sanitary Engineering. iv. International Plumbing Code by International Code Council v. Manual of water supply & treatment, 2nd edition, CPHEEO, Ministry of works and housing, New Delhi 1977 vi. Manual on sewerage and sewerage treatment, CPHEEO – Ministry of works and housing, New Delhi, 1980. vii. Modern Plumbing by E. Keith Blankerbaker viii. Rangwala, S. C., Rangwala, K. S., & Rangwala, P. S. (1990). Water supply and sanitary engineering. Charotar. ix. Wise, A. F. E. and Swaffield, J. (2012). Water, sanitary and waste services for buildings. Routledge.	

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B.Arch Syllabus

Semester-III

1.	Department proposing the course	Architecture
2.	Course Title	**Climate Responsive Architecture**
3.	L-TS-PS Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AR203004AR**
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 obtain knowledge required for understanding the influence of climate on architecture. 2. To understand design and settings of buildings for various elements of climate. 3. To study various building design strategies in different climatic zones.	
10.	Course Syllabus: **Unit-1 Elements of climate** a. Weather, Climate and its formation, Sun-Earth relationship. b. Elements of climate, measurement and data collection. c. Microclimate and Macroclimate. **Unit-2 Principles of thermal comfort** a. Physiological impact of elements of climate. b. Comfort indices, human comfort conditions. c. Natural and artificial methods of achieving thermal comfort. **Unit-3 Air movement and illumination** a. Ventilation and air movement. b. Natural illumination and day lighting. c. Artificial illumination. **Unit-4 Climate responsive design-I** a. Classification of climate at national and global level. b. Introduction to traditional design measures in various climates. c. Architectural design considerations for various climatic zones in India. **Unit-5 Climate responsive design-II** a. Study of materials and construction techniques for climate responsive design. b. Application of solar passive design techniques. c. Case studies of climate responsive designs.	
11.	References: i. B. Givoni (1981), Man, Climate and Architecture, Architectural Sciences Series - Applied Science Publishers Ltd.,London ii. B. Givoni (1994) Passive and Low Energy Cooling of building,Van Nortrand Reinhold New York, USA. iii. Evans, M. (1980). Housing, climate and comfort. London: The Architectural Press. iv. Koenigshberger, O. H., Ingersoll, T., Mayhew, A., & Szokolay, S. V. (2010). Manual of tropical housing and building: Climatic design. Hyderabad, India: Universities Press. v. Krishan, A. (2001). Climate responsive architecture: A design handbook for energy efficient buildings. New Delhi: Tata McGraw-Hill Publ. vi. Olgyay, V., & Olgyay, A. (2015). Design with climate: Bioclimatic approach to architectural regionalism. Princeton, NJ: Princeton University Press. vii. Solar Control and Shading Devices /Olgay and Olgay	

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B.Arch Syllabus

Semester-III

1.	Department proposing the course	Architecture
2.	Course Title	**Computer Aided Drafting**
3.	L-TS-PS Structure	0-2-0
4.	Credits/# of period	½
5.	Course number (Code)	**AR203005AR**
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 theoretical understanding of computer aided design and its relevance in Architecture. 2. To prepare presentation drawings, generating 2D and presentation drawings.	
10.	Course Syllabus: The course shall elaborate use of computer in Architecture. The practical exercises shall be assigned to students for drafting of 2 dimensional architectural drawings. To explain the drafting process and use of software, following shall be incorporated: a. Introduction to computer aided designing, tools and basic set up. b. Theoretical understanding. c. Comprehension of tools and systems for 2dimensional drafting. The students shall draft 2 dimensional drawings by using various software (like AutoCAD, Revit Architecture, ArchiCAD, etc.). Manipulation and alteration of existing architectural drawings 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. Paul, A. (2013). Renaissance Revit: Creating Classical Architecture With Modern Software. iv. Prof. Sham Tickoo, Exploring Autodesk Revit 2019 for MEP v. Wing, E. (2016). Autodesk Revit 2017 for Architecture: No Experience Required. John Wiley & Sons.	

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B.Arch Syllabus

Semester-III

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Communication Techniques**
3.	L-TS-PS Structure	0-2-0
4.	Credits/# of period	½
5.	Course number (Code)	**AR203006AR**
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 presentation and architectural communication skills. 2. To develop the understanding of architectural and graphical representation.	
10.	Course Syllabus: **Unit-1: Architectural Representations** a. Methods and techniques to draw various views. b. Learning of graphical strokes and architectural representations of human, trees, etc. **Unit-2: Pictographical Analyses** a. Understanding Pictography, grid, etc. with basic design principles of architecture. b. Learning the principles of framing and composition. **Unit-3: Advanced Graphical skills -I** a. Introduction to various perspective techniques by showing shades, shadows. b. To generate suitable scenario of focused objects and its surroundings. **Unit-4: Advanced Graphical skills -II** a. Various Architectural Presentation techniques. b. Enhancing writing and verbal skills. c. Methods of multimedia presentation. **Unit-5: Practical applications** a. Development of subject portfolio with learning outcome.	
11.	References: i. Atkin, W. (1983). Architectural Presentation Techniques (1st ed.). New York: Van Nostrand Reinhold. ii. Baden-Powell, C., Hetreed, J., & Ross, A. (1997). Architect's pocket book (2nd ed.). Oxford, UK: Architectural Press(An imprint of Elsevier Science). iii. Ching, F. (1943). Architectural graphics (6th ed.). New Jersey: John Wiley and Sons, Inc iv. Davis, J., & Watkins, J. (2001). Architectural Delineation: Presentation Techniques and Projects (2nd ed.). Dubuque, Iowa: Kendall Hunt Publishing. v. Dernie, D. (2014). Architectural Drawing (2nd ed.). London: Laurence King Publishing. vi. Farrelly, L. (2008). Basics Architecture 01: Representational Techniques (1st ed.). Lausanne: AVA Publishing SA. vii. Kemper, A. (1978). Presentation drawings by American architects = (1st ed.). Taipei: Morion. viii. Rani, R. (2015). Guide to visual presentation. Rockport, United States: Rockport Publishers Inc. ix. Zell, M. (2002). The Architectural Drawing Course (2nd ed.). Hauppauge, NY.: Barrons Educational Series Inc.	

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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, Ponding 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 Staircase**s 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. *Note: Deliverable shall be in form of portfolio/sheets/models/reports/multi-media presentations, etc. with hands-on experience.*	
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 Hancork, 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): 1. To develop a working knowledge of the most relevant—past, present, future—architectural theories, 2. To study, discuss, and document theoretical concepts and tenets against a general theoretical framework 3. To develop approach towards architectural design theory.	
10.	Course Syllabus: **Unit-1: The genesis of indigenous architecture and social aspects** a. Role of geographical and cultural signs, evolution. b. The concept of measuring, function, style, type, social purpose and ideology. c. The relationship of architecture to the sciences, arts, economics and politics. d. Study of selected writing, and buildings in monumental and vernacular scales. **Unit-2: Design Methodology** a. Design as a multivariate problem solving process. b. Theories of Program and Function, thinking techniques, information processing and research methods. c. Generators of creativity, design matrices and system integration. **Unit-3: Inspirations into Architecture** a. Role and principles of art, music, literature etc. in relationship with architecture b. Mind- mapping, Aesthetics and its co- relation **Unit-4: Evolution of various theories of Design** a. Contribution of various theories and movements in Architecture like, Bauhaus, Constructiveness, minimalist, etc. **Unit-5: Design Evaluation and Criticism** a. Value judgments in design. b. Appreciation of designer's skills, theories of perception and variability of perception. c. Theoretical issues in contemporary architectural thoughts.	
11.	References: i. Day, C. (1990). Places of the soul: Architectural and environmental design as a healing art. The Aquarian Press. ii. Eisenman, P. (1999). Diagram Diaries. New York : Universe. iii. Heidegger, M. (1993). Building Dwelling Thinking. Basic Writings. HarperCollins. iv. Johnson, P. and Wigley, M. (1988). Deconstructivist Architecture. New York : Museum of Modern Art. v. Kruft, Hanno. (1994). A History of Architectural Theory, From Vitruvius to the Present, Princeton Architectural Press. vi. Lefebvre, H. (1991). The production of space. Oxford: Cambridge. vii. Merleau-Ponty, M., and InEdie, J.M. (1964). The primacy of perception. North Western University Press. viii. Pallasmaa, J. (2005). The eyes of the skin: Architecture and the senses. Chichester : WileyAcademy. ix. Paul, A. J. (1994). The Theory of Architecture–Concepts & themes. New York : Van Nostrand Reinhold. New York x. Pawlyn, M. (2011). Bio-mimicry in Architecture. London : RIBA Publishing. xi. Salingaros, N. A. (2006). A Theory of Architecture. Solingen : Umbau-Verlag. xii. Smith, K. H. (2012). Introducing architectural theory: Debating a discipline. New York xiii. Theory of Architecture: Ian Foster: Routledge xiv. Tschumi, B. (1994). Architecture and disjunction. Cambridge, Massachusetts : MIT. xv. 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): 1. To disseminate a broad overview of Art and Design. 2. To understand Art awareness, creativity and cultural understanding. 3. To study design as linkage of Multidimensional creative Art.	
10.	Course Syllabus: **Unit-1: Introduction- Defining the disciplinary differences** a. Introduction to various types of Art b. Concept of beauty and Aesthetics. c. Evolution of art and design. **Unit-2: Art and Design- A historical perspective** a. History of Art through various ages b. Importance of Visual perception c. Design elements from nature. **Unit-3: Expression of Art and Design** a. Relationship between Art and Design with man, space and environment b. Concept of space c. Articulation of form, sense of enclosure, Organization of spaces **Unit-4: Introduction to theories** a. Golden proportion b. Theories of scale and proportion, Vitruvian theory, Modular man, etc. c. Principles of Design and elements of Architecture. **Unit-5: Relations in Art, Design and Architecture** a. Factors influencing the process of Art, Design and Architecture. b. Form and function. c. Review of selected examples	
11.	References: i. Cantanese, A. J. and Snyder, J. C. (1988). Introduction to Architecture. New York : McGraw hill Books Co. ii. Ching, F. D. K., Jarzombek, M. and Prakash, V. (2010). A Global History of Architecture. 2nd Ed. John Wiley & Sons. iii. Fred, S. K. (2009). Art through the ages a Global History. 3rd Ed. Clark Baxter. iv. Heidegger, M. (1993). The origin of the work of Art-Basic writings. Harper Collins v. Heskett, J. (2002). Design-A very short introduction. Oxford University Press. vi. Rapoport, A. (1969). House Form and Culture. New Jersey : Prentice Hall. vii. Salingaros, N. (2009). A Theory of Architecture. Umbau-Verlag. viii. 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	½
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.	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Design-V**
3.	L-T-P Structure	3-3-1
4.	Credits/# of period	6/7
5.	Course number (Code)	**ARPC3111**
6.	Status (Core/Essential/Elective)	Professional Core (PC)
7.	Pre-requisites (course no./title)	Architectural Design-IV
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To incorporate electrical and mechanical Services. 2. To incorporate acoustics and illumination. 3. To promote computer aided drawings.	
10.	Course Syllabus: All courses learnt in this semester and in all previous semesters are subservient to Architectural Design-V course. The students shall be encouraged to incorporate their understanding of Spatial Organization, Climate Responsiveness, Building Services (Electrical and Mechanical), Acoustics, Illumination, etc. Computer aided drawings shall be promoted to improve the skills of the students. There shall be at least two design problems during this course to achieve the objectives stated hereabove. This may be done through designing the built forms emphasizing on electrical and mechanical services, acoustics and illumination, climate responsiveness, etc. The suggestive design topics may include multiple spaces viz. shopping mall, gymnasium, fitness center, apartment, higher-secondary school, senior secondary school, convention center, auditorium, marriage hall, banquet hall, trauma care center, etc. *The deliverables shall be in form of Portfolio/Sheets/Models/Reports/Multi-Media Presentation, etc.*	
11.	References: - i. Bureau of Indian Standards (BIS) code -- IS 3646 (Part 1): 1992. ii. De Chiara, J. (2001). Time-saver standards for building types. McGraw-Hill Professional Publishing. iii. Greeno, R. (2007). Building services handbook. London: Butterworth-Heinemann. iv. Indian Standard Code of Practice for Acoustical Design of Auditoriums and Conference Halls (Ninth Ed.). (December 1998). Manak Bhavan, 9 Bahadur Shah Zafar Marg New Delhi 110002: Bureau of Indian Standards. v. National Building Code (NBC), 2016, GoI. vi. Neufert, E., Neufert, P., & Kister, J. (2012). Architects' data. John Wiley & Sons.	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**History of Post Renaissance Architecture**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPC3112**
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 learn the evolution of Architectural styles after European Renaissance. 2. To understand the changes in architectural characteristics after Renaissance.	
10.	Course Syllabus: **Unit-1: Advent of Tudor, Baroque, Rococo and Neo- Classic Architectural Style** a. Principles and philosophies. b. Various styles, expressions, and evolutions. c. Case examples. **Unit-2: Neo-Gothic styles and Modernism** a. Principles and philosophies. b. Various styles, expressions, and evolutions. c. Case examples. **Unit-3: Art-Nouveau, Expressionism and Art Deco styles** a. Principles and philosophies. b. Various styles, expressions, and evolutions. c. Case examples. **Unit-4: Usonian, Brutalism and Post-modernism** a. Principles and philosophies. b. Various styles, expressions, and evolutions. c. Case Examples. **Unit-5: The era of Deconstructivism, Neo-futurism, Parametricism and Utopian architectural styles** a. Principles and philosophies. b. Various styles, expressions, and evolutions. c. Case examples. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Baker, G. H. (1996). *Design Strategies in Architecture: An Approach to the Analysis of Form.* United Kingdom: Van Nostrand Reinhold. ii. Curtis, W. J. R. (1987*). Modern Architecture Since 1900.* United Kingdom: Prentice-Hall. iii. Kostof, S. (1985*). History of Architecture: Settings and Rituals*. United Kingdom: Oxford University Press. iv. Norberg-Schulz, C. (1980). *Meaning in Western Architecture*. United Kingdom: Rizzoli. v. Sir Banister Fletcher (2019). *Global History of Architecture*. United Kingdom: Bloomsbury Visual Arts. vi. Taschen. (2015). *Architectural Theory: From the Renaissance to the Present*. Germany: Taschen.	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**Building Bylaws, Codes and Practice**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPC3113**
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 make students aware of the byelaws and regulations in Architectural practices. 2. To understand acts, regulations, controls, standards, codes, etc.	
10.	Course Syllabus: **Unit-1: Introduction** a. Understanding general concept of Development Control Rules in buildings and agencies enforcing them. b. Definitions need and importance of building byelaws. c. Learning various terminologies pertaining to building byelaws as per Indian standards/manuals/handbooks/codes. **Unit-2: Byelaws with respect to various aspects-I** a. Road width, plot size, air funnel, sky-plane, etc. b. Lighting and Ventilation. c. Parking and Site circulation. d. Acoustical Measures and HVAC. **Unit-3: Byelaws with respect to various aspects-II** a. Fire Safety and Fighting. b. Universal Accessibility. c. Disaster Mitigation (natural and manmade). d. Building Types. **Unit-4: Development Controls and Building Approval Process** a. Understanding of Development plan, Landuse map, Zoning Regulations, Aesthetic Controls, TDR, etc. b. Sub-division, Land Development Standards, Municipal Byelaws in various states. c. Steps involved in Building Approval. **Unit-5: Zoning Regulations for Special Zones** a. Coastal/Island Regulation Zones (CRZ). b. Industrial Area and Special Economic Zones (SEZ). c. Special Area Development Authority (SADA). d. Conservation Zone with elements of Local, State, and National importance. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. (n.d.). The Architects Act, 1972 - Council of Architecture. ii. "The Indian Institute of Architects." http://www.iiamumbai.com/publications.php. Accessed 26 Mar. 2021 iii. Model Building Bye Laws: Ministry of Housing and Urban Affairs iv. "ECBC User Guide - Bureau of Energy Efficiency." v. "Rights of Persons with Disabilities Act, 2016. - India Code vi. (2016, July 12). URDPFI Guidelines: Ministry of Urban Development. vii. (2018, December 14). National Building Code - Bureau of Indian Standards.	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**Building Materials and Construction Techniques-V**
3.	L-T-P Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	**AREP3111**
6.	Status (Core/Essential/Elective)	Essential Program Requirement (EPR)
7.	Pre-requisites (course no./title)	AREP2211-Building Materials and Construction Techniques-IV
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To study steel as a building material. 2. To study various building components made up of steel. 3. To understand working and construction details of steel structures.	
10.	Course Syllabus: **Unit-1: Steel Truss: General** a. Roof truss, span, and details. b. North light truss, etc. **Unit-2: Steel Truss: Long Span** a. Tubular and Monitor truss. b. Portal frames, etc. **Unit-3: Multistoried steel structures and space frames** a. Multistoried steel structures. b. Space frames, etc. **Unit-4: Modern Construction Systems** a. Modern systems. b. Truss less system of construction, etc. **Unit-5: Miscellaneous** a. Steel Grillage Foundation. b. Staircase, Balconies, etc. in steel. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
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. Kumar, S. (2003). *Building Construction. 19th Ed.* Delhi: Standard Publishers. 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. Punmia, B.C. and Jain, A. K. (2016). *Building Construction. 11th Ed.* New Delhi: Laxmi Publications. vii. Rangwala, S. C. (2017). *Engineering Materials: Material Science. 43rd Ed.* Anand: Charotar Publishing House Pvt. Ltd. viii. Rangwala, S. C. (2019). *Building Construction 33rd Ed.* Anand: Charotar Publishing House Pvt. Ltd.	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**Concrete Structures**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP3112**
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 design RCC structures under bending, shear, and/or axial loads. 2. To introduce the basic concepts of Pre-stressed Concrete structures.	
10.	Course Syllabus: **Unit-1: Introduction to Concrete Structures** a. Stress-Strain Curves. b. Working Stress Method. c. Ultimate Strength Method. d. Limit State Method. **Unit -2: Design of Beams** a. Singly Reinforced Beams. b. Doubly Reinforced Beams. c. Flanged Beams (T, & L Beam). **Unit -3: Design of Columns and Foundations** a. Columns Under Axial Compression. b. Columns under Uni-axial and Bi-axial Bending. c. Isolated Footings for Rectangular and Circular Columns. d. Combined Footings. **Unit - 4: Design of Slabs & Staircase** a. One Way Slabs. b. Two-Way Slabs with various boundary conditions. c. Special Reinforcement. d. Dog Legged Staircase and Open Well Staircases. **Unit -5: Introduction to Special Concrete Elements** a. Pre-stressed Concrete. b. RCC Cantilevered Overhangs, Covered Ways, etc. c. Continuous Slabs, Flat Slabs, Waffle Slabs, etc. d. Inverted Beams, Concealed Beams, Continuous Beams, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Bureau of Indian Standard. *Design Aids for Reinforced Concrete to IS: 456 (1978), SP16 (1980)*, New Delhi. ii. Bureau of Indian Standards (2000). *IS 456*: Plain and Reinforced Concrete - Code of Practice, New Delhi. iii. Design, R. C. (2003). by S. Unnikrishna Pillai and Devdas Menon. iv. Hurst, M. K. (2017). *Prestressed Concrete Design*. CRC Press. v. Neville, A. M. (1995). *Properties of concrete (Vol. 4)*. London: Longman. vi. Raju, N. K. (2006). *Prestressed concrete*. Tata McGraw-Hill Education. vii. Ramamrutham, S., & Narayan, R. (2011). *Design of Reinforced Concrete Structures (conforming to IS 456): Limit State Method and Working Stress Method. Dhanpat Rai Pub Company.*	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**Site Planning**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPE3111-1**
6.	Status (Core/Essential/Elective)	Professional Elective (PE) -II
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To develop the complete understanding of a site and its surroundings in holistic manner. 2. To acquaint students with all the components and potentials of the site.	
10.	Course Syllabus: **Unit-1: Introduction to Site Planning** a) Site planning process and its significance. b) Assessment of potential of the site. c) Relationship of site context with the built forms. **Unit-2: Site Characteristics** a) Location, context, size, climate etc. b) Topography, microclimate, hydrology, etc. c) Physical features (natural and manmade). **Unit-3: Site Analysis and Representations** a) Site information collection and contextual analysis. b) Contour analysis and development. c) Representation tools and techniques. **Unit-4: Site Design Elements** a) Landscape, access, parking, circulation, etc. b) Vista, viewpoints, etc. c) Built forms; existing and proposed. **Unit-5: Site Development** a) Site zoning and layout design. b) Site services. c) Site design and development process. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Dines, C.W.H.N.T. (2001). *Time saver Standards for Landscape Architecture*, Mc. Graw Hill. ii. Higgins, C., Beer, A. (2004). *Environmental Planning for Site Development: A Manual for Sustainable Local Planning and Design*. (n.p.): Taylor & Francis. iii. LaGro, J. A. (2013). *Site Analysis: Informing Context-Sensitive and Sustainable Site Planning and Design*. Germany: Wiley. iv. Lynch,K and Hack, G (1984) *Site Planning* , MIT PRESS. v. McHarg, I. L. (1969*). Design with nature (pp. 7-17).* New York: American Museum of Natural History. vi. Russ, T.H. (2002) *Site Planning and Design Handbook*, Mc Graw-Hill Companies. vii. Steven, S. (2004) *Site engineering for landscape Architects*, John willey and sons Inc.	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**Geometry in Architecture**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPE3111-2**
6.	Status (Core/Essential/Elective)	Professional Elective (PE) -II
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand geometric principles that govern architectural design. 2. To develop an understanding for principles of design mathematically. 3. To interpret symbolism through mathematical logic.	
10.	Course Syllabus: **Unit-1: The Hidden Order** a. Arithmetic and its role. b. Geometry and its role. c. Mathematics in nature. **Unit-2: Orders and their understanding-I** a. Vedic principles and philosophies. **Unit-3: Orders and their understanding-II** a. Western principles and philosophies. **Unit-4: Complex geometry and its understanding** a. Classification and techniques in complex geometry. b. Spirals in nature, logarithmic, epispiral, etc. c. Algorithm and parametricism in architecture. **Unit-5: Aesthetics and Visual perception** a. Various principles in landscape. b. Various principles in architecture. c. Sacred geometry and divine proportions, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Achen, S. T. (1978). *Symbols Around Us*. United Kingdom: Van Nostrand Reinhold. ii. Argüelles, J., Argüelles, M. (1985). *Mandala*. United States: Shambhala. iii. Blackwell, W. (1984). *Geometry in Architecture*. United States: Key Curriculum Press. iv. Briggs, J. (1992). *Fractals: The Patterns of Chaos: a New Aesthetic of Art, Science, and Nature*. United Kingdom: Simon & Schuster. v. Brunés, T. (1996). *The Secrets of Ancient Geometry and Its Use*. United States: Sue Eckermann Golik. vi. Huntley, H. E. (2012). *The Divine Proportion*. United Kingdom: Dover Publications. vii. Lawlor, R. (2013). *The Geometry of the End of Time: Proportions Prophesy and Power*. Australia: Robert Lawlor. viii. Meisner, G. B. (2018). *The Golden Ratio: The Divine Beauty of Mathematics*. United States: Race Point Publishing. ix. Skinner, S. (2009). *Sacred Geometry: Deciphering the Code*. United Kingdom: Sterling.	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**Rendering and Advance Computing in Architecture**
3.	L-T-P Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**AREP3121**
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 acquaint students with Realistic Perspective Views and Presentation Skills. 2. To create understanding of 3D Visualization.	
10.	Course Syllabus: Introduction to presentation tools & techniques, virtual reality, architectural presentation using various graphic/Image editing software. Students will be imparted with the skills of image editing and processing along with exposure to various mediums of presentation, making blend of two surfaces and create 3D effect drawings from 2D objects using rendering tools. Students will also be exposed to rendering tools, styles of rendering, lighting, and sciography, texturing of various materials, setting of sky condition, camera settings, editing tools, and other render settings. They will also be skilled with post-production rendering. Students will get acquainted with representation skill of plans, elevations and sections in architectural drawing as well as trained for different themes of architectural rendering techniques like monochromatic rendering, realistic rendering, etc. *The deliverables shall be in form of drawing portfolio/presentations based on the work done in the semester.*	
11.	References: - i. Bark, S. (2012). *An Introduction to Adobe Photoshop*. Ventus Publishing ApS, Sheffield. ii. Brightman M. (2013). *The SketchUp Workflow for Architecture: Modeling Buildings, Visualizing Design, and Creating Construction Documents with SketchUp Pro and Layout*. John Wiley & Sons. iii. Gindis, E. (2014). *Up and Running with AutoCAD 2015: 2D & 3D Drawing and Modelling*. Oxford: Elsevier. iv. Smith, B. L. (2007). 3ds Max 2008 Architectural Visualization Beginner to Intermediate. Sarasota: 3DATS. v. Tal D. (2013). *Rendering in SketchUp: From Modeling to Presentation for Architecture, Landscape Architecture and Interior Design*. John Wiley & Sons.	

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B.Arch. Syllabus
Semester - V

1.	Department proposing the course	Architecture
2.	Course Title	**Working Drawing**
3.	L-T-P Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**ARPC3121**
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 enable students to prepare the drawings for approval by the Authority. 2. To train the students about detailing, labeling, symbols, dimensions, notations, etc. 3. To acquaint students with the essential components of Good for Construction (GFC).	
10.	Course Syllabus: Any small-scale Architectural Design project such as Bungalow, Farmhouse, Office cum Residence, etc., shall be taken up to explain and make students prepare their Good for Construction (GFC) drawings. The detailing can be done for the building's framed structure but detailing for the same building in case of a load-bearing structure shall also be discussed. The drawings to be prepared for any of the above project shall be as mentioned below: The focus shall be on Submission Drawings, Building Layout Drawings, Architectural Drawings, Structural Drawings, and different Schedules. The students shall also be informed about the layout of drawing blocks and title blocks, drawing registers, folding, and filing of drawing sheets, setting-up the building layouts, etc. The submission/corporation drawings should be prepared for acquiring necessary approvals. The Architectural drawings should include Architectural floor plans, Site plans, Terrace plans, Sections, Elevations, etc. Different architectural schedules may include opening schedules, flooring schedules, finishing schedules, etc. Miscellaneous Architectural Details may consist of Staircase, Kitchens, Toilets, Ramps, Balconies, Railings, Handrails, Landscape, Building Envelopes, etc. The Structural drawings for sub-structure and super-structure should incorporate details of Foundations, Columns, Beams, Slabs, etc. The detailing of various other building components like the staircase, boundary wall, parapet wall, jali works, etc., may also be prepared as per the design. *The deliverables shall be in form of portfolio/report comprising all the drawings prepared in the semester.*	
11.	References: - i. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria: The Images Publishing group. ii. RIBA Working Drawings Handbook, Keith Styles, 2014,1893 (Part 1). iii. Weston, R. (2004). Plans Sections Elevations – Key buildings of the twentieth century. London: Laurence King Publishing.	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Design-VI**
3.	L-T-P Structure	3-3-1
4.	Credits/# of period	6/7
5.	Course number (Code)	**ARPC3211**
6.	Status (Core/Essential/Elective)	Professional Core (PC)
7.	Pre-requisites (course no./title)	Architectural Design-V
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To incorporate the building byelaws and codes of practices in Architectural Design. 2. To incorporate necessary building services such as firefighting, HVAC and other specialized services in architectural design.	
10.	Course Syllabus: All courses learnt in this semester and in all previous semesters are subservient to Architectural Design-VI course. The course shall initiate with an Educational Tour accompanied by 1 teacher per 20 students (approx.) for understanding the application of building byelaws and codes of practices for varied building types and scale in different cities. 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 design the building incorporating all necessary building byelaws and to understand its influence on the building design. The suggestive design topics may include multiple spaces viz. gated community, railway station, bus terminus, factory design, institute building, polytechnic, students activity center, gymkhana, motel, super-specialty hospital, 5-star hotel, etc. *The deliverables shall be in the form of Portfolio/Sheets/Models/Reports/Multi-Media Presentation, etc.*	
11.	References: - i. GoI. (2016). *National Building Code (NBC).* ii. Neufert, E., Neufert, P., & Kister, J. (2012). *Architects' Data.* John Wiley & Sons. iii. Russ, T. H. (2009). *Site Planning and Design Handbook.* New York: McGraw-Hill.	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Town Planning**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPC3212**
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 provide elementary knowledge of Town Planning and basic Planning Techniques. 2. To make students familiar of process of city evolution, concepts related to identifying and solving various issues related to cities.	
10.	Course Syllabus: **Unit-1: Introduction** a. Introduction to Town Planning. b. Evolution of Town Planning. c. Relationship of Town Planning with other allied fields such as Urban Design, Conservation, Housing, Environmental Planning, etc. d. Planning Typologies and Elements of Planning (such as Landuse, Character, Densities, etc.). **Unit-2: Planning Techniques and Theories** a. Planning Approaches. b. Zoning and Zoning Regulations. c. Theories of planning like Land-use Theory, Exploratory Theories, Speculative Theories, etc. d. Legal Aspects of Planning - Police Power, Eminent Domain, Development Controls, Urban Local Bodies, Acts, etc. **Unit-3: Surveys in Town Planning** a. Socio-Economic and Land-use Survey. b. Density and Infrastructure Survey. c. Survey Techniques. d. Sample Selection Methods. **Unit-4: Types of Plans and Plan Preparation** a. Types of Plans like Perspective Plan, Regional Plan, Development Plan, Action Area Plan, etc. b. Planning Process for preparing Development (Master) Plans. c. Planning of New Towns and Industrial Towns. d. Internal Structures of Towns, Inner City Development. **Unit-5: Open Area and Transportation Planning** a. Hierarchy of Open Spaces and Social Forestry. b. Introduction to Transportation Planning and TOD. c. Road Network, Hierarchy of Roads, Intersections, Interchanges, Rotary and Road Design, etc. d. Transportation Survey and Analyses. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Bandyopadhyay A., *Textbook of Town Planning*, Kolkata, India, 2010. ii. Eisner, S., Gallion, A., & Eisner, S. (1993). *The urban pattern*. John Wiley & Sons. iii. Ramachandran, R. (1992). *Urbanization and urban systems in India*. OUP Catalogue. iv. Rao, M. P. (2001). *Urban Planning: Theory & Practice*. CBS Publishers & Distributors.	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Estimation, Costing and Valuation**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPC3213**
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 importance of cost in the project. 2. To learn the technical language of writing an estimate.	
10.	Course Syllabus: **Unit-1: Specifications** a. Definition, importance, and types. b. Use of Indian standard specification handbooks like PWD, CPWD, etc. c. Methods of specification writing and its influence on cost. d. Writing Standard clauses and instructions. **Unit-2: Estimation** a. Terminologies and types. b. Methods of Estimation. c. Calculations for basic building materials like Concrete works, Brick works, Earthworks, etc. d. Quantity Surveying for various items. **Unit-3: Rate Analysis and Costing** a. Introduction to Schedule of Rates and Market Rates. b. Rate analysis, overhead costs, cost of materials and labor for various items of work, measurement of work for interim and final certificates for payment to contractors. c. Preparing BOQs. **Unit-4: Reports and Tenders** a. Estimation Reports. b. Administrative Approval, Expenditure Sanction, Technical sanction, Competent authority, etc. c. Issue rates, Payment on accounts, Suspense account, Security Deposit, Earnest Money Deposit, Performance Guarantee, Muster Roll, Measurement Book, etc. **Unit-5: Valuation** a. Terminologies and Types. b. Gross income, Net income, Depreciation Value, Capitalized value, Scrap Value, Salvage value, etc. c. Methods of Valuation and Valuation Reports. d. Rent Fixation, Mortgage, Lease, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Chakraborti, M. (1987). *Estimating, Costing and Specification in Civil Engineering.* ii. Dutta, B. N., & Dutta, S. (1991). *Estimating and Costing in Civil Engineering: Theory and Practice: including Specifications and Valuation.* UBS. iii. Rangwala, C. (2015). *Estimating, Costing and Valuation.* iv. Singh, G. (2002). *Estimating Costing and Valuation.* Delhi: Standard Distributors.	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Building Materials and Construction Techniques-VI**
3.	L-T-P Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	**AREP3211**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	AREP3111-Building Materials and Construction Techniques-V
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand Prefabricated and Pre-engineered construction. 2. To study various building components like openings and canopies.	
10.	Course Syllabus: **Unit-1: Prefabricated construction- Concrete** a. Precast (slab, columns, wall panels, etc.). b. Pre-stressed (slabs, beams, columns, waffles, etc.). c. On-site and off-site prefabrication. **Unit-2: Prefabricated construction- Steel and Pre-engineered construction** a. Steel Components: Bracings, Purlins and Eaves, Sheeting and Cladding Materials. b. Ventilators, Skylights, Louvers, Doors, Windows, Roof Curbs, Fasteners, etc. c. Pre-engineered construction like sandwiched panels, etc. **Unit-3: Special Openings** a. Rolling shutter. b. Collapsible gate. c. Fencing, wicket gate, railings, grills. **Unit-4: Canopies** a. Designing of Porch, Canopies in RCC and steel (including tubular). b. Designing of Covered ways in steel and RCC. c. Fixing details of lighting fixtures, rainwater drainage systems, etc. in canopy. **Unit-5: Miscellaneous** a. Introduction to Composite construction. b. Expansion joints, Water proofing including basement water proofing. c. Pile foundations, shallow foundations. d. Defects in buildings. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
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. Kumar, S. (2003). *Building Construction. 19th Ed.* Delhi: Standard Publishers. 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.	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Design of Steel Structures**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP3212**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To introduce the fundamentals of Steel Structures design. 2. To understand the behavior and application of steel structures.	
10.	Course Syllabus: **Unit - 1: Introduction** a. Indian Standard Rolled Steel Sections. b. I.S. code specifications. c. Working Stress Method. d. Limit State Method. **Unit - 2: Steel Connections** a. Riveted Connections. b. Bolted and Pin Connections. c. Welded Connections. d. Eccentric and Moment Resistant Connections. **Unit - 3: Design of Compression Member and Tension member** a. Axially and Eccentrically Loaded Column. b. Lacing and Battened Column. c. Column Splice. d. Net Sectional Area. e. Tension Splices and Lug Angle. **Unit - 4: Design of Flexural Member and Footing** a. Laterally Supported Beams. b. Laterally Unsupported Beams. c. Built-up Beams. d. Footing for Column Base. **Unit - 5: Introduction to Special Steel Structures** a. Roof Trusses b. Tubular Structure. c. Portal Frames. d. Light Gauge Structures, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Duggal, S. K. (2000). Design of steel structures. Tata McGraw-Hill Education. ii. Negi, L. S. (1997). Design of steel structures. Tata McGraw-Hill Education. iii. Punmia, B. C., Jain, A. K., & Jain, A. K. (1998). Comprehensive design of steel structures. Firewall Media. iv. Raju, N. K. (2005). Advanced reinforced concrete design. CBS Publishers & Distributors Pvt Limited. v. Ramchandra, S., & Gehlot, V. (2007). Design of Steel Structures Vol. II. Standard Book House. vi. Standard, B. I. (2007). General construction in steel-code of practice. 3rd Revision, Bureau of Indian Standard, New Delhi, India,	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Earthquake Resistant Architecture**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AROE3211-1**
6.	Status (Core/Essential/Elective)	Open Elective (OE)-I
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To acquaint the students with the knowledge of Earthquake Resistant Building Techniques. 2. To impart knowledge of the best practices in Earthquake Resistant Architectural Design.	
10.	Course Syllabus: **Unit-1: Earthquake Basics** a. Introduction to earthquakes, plate tectonics, faults, consequences of earthquake. b. Earthquake parameters, magnitude & intensity, scales. c. Seismic zones of India, damages caused during past earthquakes and lessons learnt. **Unit-2: Fundamentals of Earthquake Vibrations of Buildings** a. Static load and Dynamic load (force control and displacement control), natural frequency, resonance, and increased response. b. Responses of buildings to different types of vibrations like free and forced, damped and undamped vibration. c. Response of building to earthquake ground motion, soil liquefaction. **Unit-3: Design Philosophy** a. Philosophy of earthquake resistant design, Virtues of earthquake resistant structures (strength, stiffness, ductility, and configuration). b. Architectural considerations in earthquake resistant planning and design of buildings (configuration characteristics and their effects, plan, and vertical configuration problems). c. Seismic Micro-zonation and Architectural Planning, Base Isolation for reduction of Earthquake hazard in Multistoried Buildings. **Unit-4: Earthquake Resistant Masonry Buildings** a. Un-reinforced Masonry, Basics of masonry, units of masonry, good construction practices. b. Earthquake resistant features- bands and vertical reinforcement. **Unit-5: Earthquake Proof Construction and Architecture** a. Making buildings resilient to earthquakes, Earthquake proof and earthquake resistant design, seismic structural configuration. b. Building codes and regulations for earthquake prone areas. c. Retrofitting, Repair and seismic strengthening of masonry and concrete buildings. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Agrawal, P., & Shrikhande, M. (2006). *Earthquake resistant design of structures.* PHI Learning Pvt. Ltd. ii. Chopra, A. K. (2007). *Dynamics of structures*. Pearson Education India. iii. Duggal, S. K.; Earthquake resistance design of structures; Oxford University Press, New Delhi. iv. GoI. (1993). *Code of Practice for Ductile Detailing of RC Structures* - IS: 13920. New Delhi. v. GoI. (1993). *Code of Practice for earthquake resistant design & Construction of buildings* - IS 4326. New Delhi. vi. GoI. (2002). Criteria for earthquake resistant design General provision & Building - IS: 1893. New Delhi. vii. IITK-GSDMA EQ26 V -3.0 Design Example of a Six Storey Building	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Universal Design**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AROE3211-2**
6.	Status (Core/Essential/Elective)	Open Elective (OE)-I
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To acquaint the students to the types of impairments and the need to design for everyone. 2. To make students understand various standards, codes, and guidelines of Universal Design. 3. To understand the process of designing the elements and services within and outside a building with respect to the impairments.	
10.	Course Syllabus: **Unit-1: Introduction** a. Barrier Free and Universal Design. b. Goals of Universal Design. c. Types of Impairments and Needs of Specially Abled. d. Norms, Codes and Guidelines of Universal Design. **Unit-2: Standards for Universal Design** a. Mobility Devices (such as wheelchair, white canes, etc.). b. Circulation Dimensions. c. Height and Cone of vision. d. Lighting and Illumination Levels. **Unit-3: Signages and Textures** a. Signages and Symbols. b. Special Surface Textures and Levels. c. Guiding and Warning Methods. d. Alarm Systems, etc. **Unit-4: Universal Accessibility** a. Ramp, Staircases, Lifts, Escalators. b. Vehicular Areas, Parking, Curb Ramps. c. Corridor, Lobby, Pathway, Emergency Exit. d. General Design considerations, Maneuvering Space, etc. **Unit-5: Universal Design Elements and Services** a. Doors, Windows, Entrances. b. Wash Area, Toilets, Shower Cubicles, Drinking Water Fountains, Kitchens, etc. c. Indoor and Outdoor Furnitures. d. Best Practices in Universal Design. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. CPWD. (2014), *Handbook on Barrier Free and Accessibility*, MoUD, GoI, New Delhi. ii. CPWD. (2016), *Space Standards for barrier-free built environment*, MoUD, GoI, New Delhi. iii. GoI. (2016), *National Building Code, India*. New Delhi. iv. GoI. (2016), *Rights of persons with disabilities*, New Delhi.	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Disaster Management and Mitigation Systems**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AROE3211-3**
6.	Status (Core/Essential/Elective)	Open Elective (OE)-I
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To prepare and equip the students in disaster preparedness, mitigation, and management. 2. To develop the skills for building disaster resistant buildings.	
10.	Course Syllabus: **Unit-1: Introduction:** a. Definition of disaster, hazard, risk, and vulnerability. b. Types of disaster, indicators, and related definitions. c. Disaster profile of India. **Unit-2: Understanding Disaster Management** a. Disaster management in phases (pre, during and post). b. Concerned authorities and stakeholders of the disaster management process. c. Preparedness and mitigation measures for various disasters. d. Post disaster relief & logistics management. **Unit-3: Disaster Management Plans** a. Disaster mapping and identifying the hazards and vulnerabilities. b. Introduction to various disaster management plans laid down by concerned ministries/ departments/organizations. c. Predictions, early warnings and safety measures of disaster, role of information technology, education, communication, and training, role of government, etc. **Unit-4: Disaster Management (pre disaster)** a. Building safety standards for hazards. b. Design aspects and considerations for various types of buildings. c. Disaster resistant construction and their case studies. **Unit-5: Disaster Management (post disaster)** a. Damage Assessment. b. Transitional Shelters and Fast Construction Techniques. c. Rehabilitation, Reconstruction and Recovery. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Bhandari, R. K. (2006*). Disaster Management in India: A New Awakening. Disaster and Development*, 1(1), 1-26. ii. Collins, L. R. (2000). *Disaster management and preparedness*. CRC Press. iii. Davis, I. (1978). *Shelter after disaster. In Shelter after disaster* (pp. 127-127). iv. Goel, S. L. (2006). *Encyclopedia of Disaster Management*. Deept & Deep Publications. v. Government of India, (2004), '*Disaster Management in India*' – A Status Report, Ministry of Home Affairs (Disaster Management Division), New Delhi vi. Pinkowski, J. (Ed.). (2008). *Disaster management handbook*. CRC press. vii. Sengupta, A. K. (2006). *Development of a Handbook on Seismic Retrofit of Buildings in India*. viii. Zebrowski, E., & McGuire, B. (1997). *Perils of a Restless Planet: Scientific Perspectives on Natural Disasters*. Nature, 389(6654), 926-926.	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Interior Design**
3.	L-T-P Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**ARPE3221**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To develop a holistic approach towards design by considering internal space utilization. 2. To learn the impact of visual experience.	
10.	Course Syllabus: The course aims to create an understanding among students about the role of interior design in total design process, procedure involved in the designing process, and impact of the interior space on human psychology and behavior. The students will learn about the components of interior design such as space, planes, form, color, texture, abstract and formal configuration, geometrical disciplines, visual controls, illusions with their separate and combined impact, use of materials, colors, styles, orientation, privacy, grouping, flexibility, circulation, furniture arrangements, etc. It is also intended to familiarize the students with different materials used in interiors elements such as surfaces viz. walls, floor, ceilings etc., furniture-loose and built in, upholstery, drapery, rugs, carpets, and other floor coverings, water bodies, planters, and plantation, lighting and lighting fixtures, decorative features like paintings, sculptures, etc. Emphasis shall be given on the services used in interiors viz. electrical wiring system, acoustical treatment, etc. The suggestive design topics may include interiors for spaces having different uses and requirements such as Reception halls, Waiting Lounges, Restaurants, Foyers, Drawing Halls, Offices, Residential Spaces, Exhibition Halls, Hotels, Theatres, Assembly Halls etc. *The deliverables shall be in the form of Portfolio/Sheets/Models/Reports/Multi-Media Presentation, etc.*	
11.	References: - i. Francis D.K.Ching, *Interior Design Illustrated*, V.N.R. Pub. NY 1987. ii. John F.Pile, *Interior Design*, John Wiley and Sons 2004. iii. Joseph DeChiara, Julius Panero, Martin Zelnik, *Time Saver's Standards for Interior Design*, McGraw-Hill Professional 2001. iv. Kasu, A. A. (2005). *An introduction to art, craft, technique, science & profession of interior design.* Bombay: Equara Publications.	

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B.Arch. Syllabus
Semester - VI

1.	Department proposing the course	Architecture
2.	Course Title	**Advanced Working Drawing**
3.	L-T-P Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**ARPC3221**
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 learn preparation for detailed working drawings with respect to services. 2. To accustom students with the required coordination between architectural, civil, and other technical drawings.	
10.	Course Syllabus: Any medium scale Architectural Design project such as Hostel, Community Centre, Primary School, Multi-level Car Parking etc. shall be taken up for the preparation of their Good for Construction (GFC) drawings. The focus shall be on architectural drawings and service layouts. The drawings to be prepared for any of the above project shall be as mentioned below: The Architectural drawings may include drawings for Architectural Floor plans, Site plans, Terrace Plans, etc. The drawings for various services at building as well as site level shall be prepared. The building services may include water supply, sanitation, storm water management, electrical, firefighting, HVAC, etc. *The deliverables shall be in the form of Portfolio comprising of all the drawings prepared in the semester.*	
11.	References: - i. Joe, B. (Ed). (2002). *Details in Architecture: Vol. I-V.* Victoria: The Images Publishing group. ii. Styles K. (2014). *Working Drawings Handbook,* RIBA (Part 1). iii. Weston, R. (2004). *Plans Sections Elevations – Key buildings of the twentieth century.* London: Laurence King Publishing.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Design-VII**
3.	L-T-P Structure	3-3-1
4.	Credits/# of period	6/7
5.	Course number (Code)	**ARPC3211**
6.	Status (Core/Essential/Elective)	Professional Core (PC)
7.	Pre-requisites (course no./title)	Architectural Design-VI
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand various aspects of spatial planning. 2. To learn the concepts of Site development and campus design. 3. To incorporate landscape design in Architectural design process.	
10.	Course Syllabus: All courses learnt in this semester and in all previous semesters are subservient to Architectural Design-VII course. The students shall deal with mixed use of the spaces and multifunctionality of the buildings. The scale of the design shall be at campus level. Students shall be encouraged to deal with large scale projects and site planning strategies. There shall be at least two design problems during this course to achieve the objectives stated hereabove. The suggestive design topics may include multi usage and multiple spaces viz. Institute Campus (Academic/Research/Non-Academic Institutes) multispecialty hospital, office campus, stadium, hotel, resort, township, shopping mall with multiplex, etc. *The deliverables shall be in the form of Portfolio/Sheets/Models/Reports/Multi-Media Presentation, etc.*	
11.	References: - i. GoI. (2016). *National Building Code (NBC).* ii. Neufert, E., Neufert, P., & Kister, J. (2012). *Architects' data.* John Wiley & Sons. iii. Russ, T. H. (2009). *Site planning and design handbook.* New York: McGraw-Hill.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Urban Design**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPC4112**
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 interpret the relationship of Design from buildings to City. 2. To understand and analyze the complex urban fabric.	
10.	Course Syllabus: **Unit-1: Introduction to City scale** a. Parameters of Urban design. b. Elements of Urban design. c. Place identity and place-making. **Unit-2: Visual and Aesthetical Elements** a. Patterns and Aesthetical Orders. b. The Kinesthetics Experiences. c. Townscape and its role. **Unit-3: Understanding Morphological Elements in Urban Design** a. Urban forms and concepts. b. Relationship of Built and Unbuilt. c. Symbolism in Urban form. **Unit-4: Social Elements** a. Relationship between people and space. b. Public realms and its functions. c. Socials concerns related to safety, security, accessibility, inclusion, etc. **Unit-5: Functional Elements** a. Various tools and analysis techniques. b. Traditional spaces, Heritage and Urban Conservation. c. Case examples and implementation. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Alexander, P. i. t. D. o. A. C., Neis, H., Anninou, A., Alexander, C., Mahy, M., King, I. (1987). *A new theory of urban design. United Kingdom:* Oxford University Press. ii. Cuthbert, A. R. (2011). *Understanding Cities: Method in Urban Design.* United Kingdom: Routledge. iii. Gallion, A., Eisner, S., Eisner, S. (1993). *The Urban Pattern.* United States: Wiley. iv. Gehl, J. (2013). *Cities for People.* United Kingdom: Island Press. v. Graham, W. (2017). *Dream Cities: Seven Urban Ideas That Shape the World.* United Kingdom: HarperCollins. vi. Jacobs, J. (2016). *The Death and Life of Great American Cities*. United Kingdom: Random House. vii. Lynch, K. (1960). *The Image of the City. Norway:* Harvard University Press. viii. Lynch, K. (1984). *Good City Form.* United Kingdom: MIT Press.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Building Materials and Construction Techniques-VII**
3.	L-T-P Structure	2-1-1
4.	Credits/# of period	4/4
5.	Course number (Code)	**AREP4111**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	AREP3211-Building Materials and Construction Techniques-VI
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To acquaint students with the advance building materials and construction techniques. 2. To learn the joinery details for furniture, signages, facades, etc.	
10.	Course Syllabus: **Unit-1: Advanced Building Material** a. Boards (fiber boards, fireproof/resistant boards, high density fiber boards, etc.). b. Blocks (non- load bearing gypsum, AAC, GRC, GFRC, etc.). c. Composite Panels and Acoustic Materials. d. Stainless Steel. **Unit-2: Concrete and Green Building Materials** a. Ready-Mix Concrete. b. Lightweight Concrete. c. Green Building Construction Materials. **Unit-3: Built-in furniture** a. Wardrobe and Cupboard. b. Kitchen cabinet. c. Shelf and Showcases. d. Bookshelf, racks, almirahs, etc. **Unit-4: Signages, Partitions and Facades** a. Showroom front design, sign board, display board, commercial furniture, glass showcase, counter, etc. b. Partition and screens. **Unit-5: Paneling, Cladding and Advance Glazing** a. Wall paneling, soundproof construction. b. Advance Curtain Glazing. c. Various interior and exterior surface treatments such as cladding, lining, rendering etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
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. McKay, W. B. (2005). *Building Construction Metric Vol. I–IV. 4th Ed.* Mumbai: Orient Longman. iv. Moxley, R. (1961). *Mitchell's Elementary Building Construction.* London: B. T. Batsford. v. Punmia, B.C. and Jain, A. K. (2016). *Building Construction. 11th Ed.* New Delhi: Laxmi Publications. vi. Rangwala, S. C. (2017). *Engineering Materials: Material Science. 43rd Ed.* Anand: Charotar Publishing House Pvt. Ltd. vii. Rangwala, S. C. (2019*). Building Construction 33rd Ed.* Anand: Charotar Publishing House Pvt. Ltd. viii. Sushil-Kumar, T. B. (2003*). Building Construction. 19th Ed.* Delhi: Standard Publishers.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Sustainable and Energy Efficient Architecture**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP4112**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand ongoing development of Environmental Protection in building sector. 2. To study various building design strategies for Energy Efficiency and Sustainable Architecture.	
10.	Course Syllabus: **Unit-1: Introduction to Sustainability** a. Ideas, Issues, and Concepts of Sustainability in Architecture. b. Climate and Shelter. c. Sustainability Measures in Historic and Traditional Buildings. d. Examples from Different Climate Zones. **Unit-2: Energy Consumptions and Conservation Practices** a. Conventional and Non-Conventional Energy Sources. b. Methods and Assessment of Energy Consumption. c. Energy Conservation Practices. **Unit-3: Study of Sustainable Practices** a. Solar Passive, Solar Active and Hybrid Techniques. b. Water Management, Landscape, Solid Waste Management, etc. d. Sustainable Materials and Design Guidelines for Different Climatic Zones. **Unit-4: Assessment and Analysis** a. Control Systems for Energy Efficient Buildings, Illustrative Passive Buildings. b. Integration of Emerging Technologies. c. Computer Packages for Thermal Design of Buildings. d. Computer Packages for Performance Prediction. **Unit-5: Analyses for Sustainability and Energy Efficiency** a. Building Envelopes. b. Light and Ventilation. c. Thermal Comfort, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Bureau of Indian Standards, I.S. 11907 –1986 *Recommendations for calculation of Solar Radiation Buildings*, 1986. ii. *Energy Conservation Building Codes 2017*; Bureau of Energy Efficiency. iii. Givoni,B., "Man, Climate and Architecture", Elsevier, Amsterdam, 1986. 3. Smith, R. J., Phillips, G.M. and Sweeney, M. *"Environmental Science"*, Longman Scientific and Technical, Essex, 1982. iv. J.A. Clarke, *Energy Simulation in Building Design (2e)* Butterworth 2001. v. J.K. Nayak and J.A. *Prajapati Handbook on Energy Conscious Buildings*, Solar Energy Control MNES, 2006. vi. J.R. Williams, *Passive Solar Heating*, Ann Arbar Science, 1983. vii. Koenigsberger, O.H., Ingersoll, T.G., Mayhew Alan and Szokolay, S. V., *"Manual of Tropical Housing and Building part 1: Climatic Design"*, OLBN 0 00212 0011, Orient Longman Limited, 1973. viii. R.W. Jones, J.D. Balcomb, C.E. Kosiewiez, G.S. Lazarus, R.D. McFarland and W.O. Wray, *Passive Solar Design Handbook, Vol.3*, Report of U.S. Department of Energy (DOE/CS-0127/3), 1982.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Housing**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP4113**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand basic terminologies used in housing and infrastructure. 2. To understand the dynamics of housing demand and supply. 3. To understand contemporary housing programs and policies.	
10.	Course Syllabus: **Unit-1: Introduction** a. Definition, Terminologies and understanding of Housing. b. Introduction to Housing Typology and Classification (as per income, ownership, urban form, etc.). c. Physical Infrastructure. d. Social Infrastructure. e. Concept of Cluster and Community Housing. **Unit-2: Housing Dynamics** a. Housing situation, scenario in Indian and global context. b. Housing Statistics (Housing shortage, demand calculation etc.). c. Factors of Housing Demand and Supply. d. Housing Delivery Mechanism, Core Housing, Community Housing, Site, and Services Schemes etc. **Unit-3: Informal Housing** a. Informal Housing, Typologies (slums, squatters, etc.), and its Characteristics. b. Concept, Criteria and Determinants of Affordable, Low Income and Informal Housing. c. Housing for Urban Poor. d. Slum Redevelopment Models. **Unit-4: Housing Policy** a. International Housing Policies (UN Habitat, etc.). b. National and State Housing Policies. c. Legislation and Byelaws related to Housing. d. Government Housing Strategies and Schemes such as RAY, PMAY, IAY etc. **Unit-5: Special Housing** a. Housing for Singles, Old Aged, Rehabilitation Housing, etc. b. Night Shelters, Emergency Shelters, Service Apartments, Rental Housing, etc. c. Housing Finance and Role of Financial Institutes (NHB, HUDCO, etc.). d. Rural Housing, its Characteristics, and Issues. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Bandyopadhyay A. (2010) *Textbook of Town Planning*, Kolkata, India. ii. De Chiara, J. (1995). *Time-saver standards for housing and residential development*. McGraw-Hill. iii. Jain, A. K. (2009). *Urban Housing and slums*. Global Media. iv. Shah, U. C. (2015). *Lectures on planning legislation*. Suvidha Law house Indore, India. v. Untermann, R. K., & Small, R. (1977). *Site planning for cluster housing*. Van Nostrand Reinhold Company.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Intelligent Building**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AROE4111-1**
6.	Status (Core/Essential/Elective)	Open Elective (OE)-1
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To develop orientation to understand advancement in technology contributing to the intelligent buildings concept. 2. To inculcate the ideas of interface and components of building automation controls and techniques in an intelligent building.	
10.	Course Syllabus: **Unit-1: Introduction** a. Introduction & Origins of the Intelligent Buildings Concept. b. Definition and characteristics of Intelligent Buildings with brief history and contemporary concept. c. Automated buildings. d. Responsive buildings. **Unit-2: Facility Management** a. Study of Concepts of Management of facilities. b. Importance and study of planning and operational techniques for facility management. c. Various models of Building Intelligence. **Unit-3: Services** a. Demands on building and services. b. Control systems. c. Study of development of Computer Integrated Building from single function systems to integrated solutions. d. Use of building intelligence in energy management. **Unit-4: Key Issues for Intelligent Buildings** a. Multiple activity settings. b. Generic analysis of space utilization. c. Models for shared space use. d. The development of briefing process including design activity and building elements, life cycles, Coordination between life cycle, building technologies. e. Study of issues related to site, shell, skin, services, and technology. **Unit-5: Intelligent design and construction** a. Effective Space utilization. b. Expectations of user, effective communication of architectural concepts to user, Locating people and information. c. Introduction to building efficiency with respect to life cycle costs. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Constant, M., & Turnbull, P. (1994). *The Principles and Practice of Closed-circuit Television.* Paramount Publishing. ii. Eyink, J. (1988). *Building automation systems: a practical guide to selection and implementation.* BSP.Wayne H.D.; Architecture, Engineering and Environment (2002	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Modular Coordination**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AROE4111-2**
6.	Status (Core/Essential/Elective)	Open Elective (OE)-II
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand the importance of modules and its use. 2. To learn the use of modular co-ordination in building sector.	
10.	Course Syllabus: **Unit-1: Introduction to Modular Architecture** a. Understanding a Module, its Characteristics, and Standard Sizes. b. Development of Theories of Modular Architecture. c. Advantages and Disadvantages of Modular Architecture. **Unit-2: Introduction to Modular Systems** a. Modular Method in Building Construction. b. Various Materials used in Modular Architecture. c. Pre-stressed and Post-tensioned Modular Systems. **Unit-3: Modular Architecture and Co-ordination** a. Basic Principles of Modular Co-ordination. b. Basic Management Policies in Modular Co-ordination. c. Prefabricated Structures: their uses with Examples and Techniques of Constructions. **Unit-4: Modular concept as a part of Industrialization** a. Effects of Industrialization. b. Industrialized building in India and in Other Countries. c. Use of Latest Construction Techniques in Modular Co-ordination. **Unit-5: Application of Modular Architecture and Co-ordination** a. Scope and Limitations on Applicability in Various Types of Buildings. b. Case Studies of Modular Buildings in Indian and Worldwide Scenario. c. Application of Modular Co-ordination in Building Design. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Adams, M. W., Bradley, P., & American Standards Association. (1946). A62 guide for modular coordination: A guide to assist architects and engineers in applying modular coordination to building plans and details. Boston, Mass: Modular Service Association. ii. Building Materials & Technology Promotion Council, BMTPC Guidelines. iii. IS 7921 (1987): Recommendations for modular co-ordination in building industry: Horizontal co-ordination [CED 51: Planning, Housing and prefabricated construction] iv. National Building Code of India (NBC) (2016). v. Smith, R. E. (2010). Prefab architecture: A guide to modular design and construction. John Wiley & Sons. vi. Staib, G., Dörrhöfer, A., & Rosenthal, M. (2013). Components and systems: Modular construction–Design, structure, new technologies. Walter de Gruyter. vii. United States., & Adams, M. W. (1953). Basic principles of modular coordination: A method of cost reduction in building through standardized dimensions and assembly methods. Washington. viii. Wallance, D.(2021), The Future of Modular Architecture. Routledge.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Alternate Building Materials and Techniques**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AROE4111-3**
6.	Status (Core/Essential/Elective)	Open Elective (OE)-II
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To introduce the concepts of alternative methods of building construction. 2. To acquaint the students with the applicability of non-conventional building materials.	
10.	Course Syllabus: **Unit-1: Fiber Reinforced Polymer and Alternate Concrete Based Materials** a. Introduction to Fiber based and cement based alternative building materials. b. Types of Fiber based and alternate concrete-based materials (Fiber Reinforced Polymers, Fiber Reinforced Concrete, Polyester Fibers, Carbon Fibers, Ferroconcrete, etc.). c. Best practices and case studies. **Unit-2: Bamboo and Plant Based Alternatives** a. Introduction (bamboo, hemp-based materials, pine-based materials, etc.). b. Characteristics, advantages and disadvantages, application, and construction techniques. c. Best practices and case studies. **Unit-3: Low-Cost Building Materials** a. Introduction to low-cost alternatives. b. Various materials, applications, and construction techniques (Ferrocement, Cellular Lightweight Concrete, Fly ash, etc.). d. Best practices and case studies. **Unit-4: Recycled Waste Materials** a. Introduction to waste as a building material. b. Types and use of waste materials in construction (by-product based, silica fume based, organic waste, inert waste, construction and demolition waste, mineral waste, etc.). c. Best practices and case studies. **Unit-5: Latest Innovations and Techniques** a. Innovative building materials and technologies. b. Best practices and case studies. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Huang, J., & Deringer, J. (2007). Status of energy efficient building codes in Asia. *The Asia Business Council. Hong Kong SAR, 2007*, 6-9. ii. Jagadish, K. S. (2008). *Alternative Building Materials Technology*. New Age International. iii. Mackenzie, D. (1991). *Design for the Environment*. Rizzoli International Publications. iv. Majumdar, M. (2001), *Energy Efficient Buildings in India*, TERI, New Delhi.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Journalism**
3.	L-T-P Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**AREP4121**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To equip students with the brief introduction and essentials of architectural writing. 2. To explore the examples of written communication in architecture.	
10.	Course Syllabus: The course will enhance the skill and knowledge about writing on architectural criticism, experiences, narratives, reporting, etc. emphasizing on the role of architectural journalism in architectural practice. Students will get familiarized with the skills of critical appraisal, skills to discourse the ideas and concepts through developing individual writing style in defining architecture and the built environment. The course will provide an overview of the fundamentals of architectural writing, structure, documentation, and techniques. It will also introduce students to criticism in architecture, analysis of historical and contemporary examples. The course will also introduce the photojournalism, media, publishing, laws, and legislation in architectural writing. *The deliverables shall be in the form of reports, narratives, presentation, abstract writing, etc.*	
11.	References: - i. Dinsmore, G. (1968). *Analytical graphics*. D. Van Nostrand Co. ii. Friedlander, E., & Lee, J. (2011). *Feature writing for newspapers and magazines: the pursuit of excellence*. Pearson. iii. King, A. (1976). *Architectural journalism and the profession: The early years of George Godwin. Architectural History*, 19, 32-53. doi:10.2307/1568388 iv. Lange, A. (2012). *Writing About Architecture: Mastering the Language of Buildings and Cities*. United States: Princeton Architectural Press. v. Tilden, F., & Craig, R. (2008). *Interpreting our heritage*. University of North Carolina Press. vi. Wiseman, C. (2014). *Writing Architecture: A Practical Guide to Clear Communication about the Built Environment*. United States: Trinity University Press.	

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B.Arch. Syllabus
Semester - VII

1.	Department proposing the course	Architecture
2.	Course Title	**Building Information Modelling**
3.	L-T-P Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**AREP4122**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To equip the students with the fundamental knowledge and working of Building Information Modeling. 2. To inculcate the knowledge, purpose, and scope of Building Information Modeling in construction industry.	
10.	Course Syllabus: The course will provide an insight about the current construction and management practices of using Building Information Modelling to explore design options and improve on-site collaboration and communication with various stakeholders. This course introduces students to Building Information Modeling using various software like Autodesk Revit, ArchiCAD, etc. The course will guide the students to develop skills in 3D as well as parametric modeling from generic massing through building assemblies and 2D documentation through visual information management and basic design documents. The course will introduce the use of BIM and its effect on professional practice along with emerging BIM related programs and technologies. The lab shall include the introduction to fundamentals of Building Information Modeling, important tools and workflow management, Advanced Modelling, Rendering and material, Building energy simulation, etc. *The deliverables shall be in the form of presentation/reports/portfolio of the projects done using the tools and applications introduced in the course.*	
11.	References: - i. Eastman, C. M., Liston, K., Sacks, R., Eastman, C., Teicholz, P. (2008). *BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors.* United Kingdom: Wiley. ii. Eynon, J. (2016). *Construction Manager's BIM Handbook.* United Kingdom: Wiley. iii. Holzer, D. (2016). *The BIM Manager's Handbook: Guidance for Professionals in Architecture, Engineering, and Construction.* Germany: Wiley. iv. Mordue, S., Philp, D., Swaddle, P. (2015). *Building Information Modeling for Dummies.* Germany: Wiley.	

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B.Arch. Syllabus
Semester - VIII

1.	Department proposing the course	Architecture
2.	Course Title	**Professional Training**
3.	L-T-P Structure	0-0-0
4.	Credits/# of period	6/0
5.	Course number (Code)	**AREP4221**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	170 Credits
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To expose the students to the world of professional practice. 2. To acquaint students with the knowledge of various domains of Architectural practices.	
10.	Course Syllabus: The students will have to undergo practical training for a period in this semester. The aim of practical training is to expose the students to the world of Professional Practice. It will give the students experience of dealing with live projects of various nature along with site experience. The training should be under the guidance of any experienced Architect, registered with Council of Architecture, India. This training can also be undertaken in an organization involved in profession of Architecture provided that the training should be imparted by any experienced Architect registered with Council of Architecture, India. In case the student opts to go abroad he/she will work under the guidance of the professional who is registered with the Council/any other organization controlling the profession of Architecture in the respective country. The students are expected to learn about the Architectural Design Process, Office Management, Site Visits, Contract Management, Construction Materials and Techniques, Advance Building Services, etc. The works may include working details, quantity survey, and any special work done during the training period. The students should also acquaint themselves with site supervision and practices including checking site measurements, preparation of bills, site instructions, checking of executed works etc. The student must appear for the End Semester Viva-Voce Examination (ESE) as per schedule announced by the Institute at the end of the training period. The students will present the following at the time of viva-voce examination: a. Filled log sheet duly signed by the Office-Bearer. b. Training Certificate. c. Confidential Report from the Trainer. d. Copies of works done by the student during the training period. The student shall collect copies of the works done during training, duly authorized by their trainers, for the final viva voce examination. It is required to follow the guidelines given in the Training Manual provided by the Department time to time.	

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B.Arch. Syllabus
Semester - IX

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Research Methods**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPC5111**
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 develop research acumen among the students. 2. To deliver the required knowledge regarding research methods in Architecture. 3. To familiarize the students with Architectural research and writing research papers.	
10.	Course Syllabus: **Unit-1: Introduction to Research** a. Meaning, objective, types, approaches, and significance of research. b. Research methods and research methodology. c. Research process. d. Criteria of a good research and problems faced. **Unit-2: Architectural Research Methodology—An Introduction.** a. Domain of Architectural Research; Understanding the nature of research in architecture- Need & significance; Ethics. b. Concepts of theory; Identifying Theoretical Framework; Ontological and Epistemology of Knowledge. c. Defining Research Problems, Framing Research Question; Research design – need, components, considerations, and Research Process including Design of Sampling, Scaling Techniques and Methods of data collection. **Unit-3: Strategies of Architectural Research** a. Historical Research; Qualitative Research; Correlational research; Experimental and Quasi-experimental research; Simulation Research; Logical Argumentation research and Case Studies and Combined Strategies **Unit-4: Techniques of Analyses** a. Processing and Analyzing of data; Statistics in research; measure of Central Tendency; Measure of Dispersion; Asymmetry; Relationship. b. Graphical representation of analysis. Qualitative/other Data Analysis: Data validation, Reliability, and calibration. **Unit-5: Report Writing** a. Purpose, characteristics, guidelines, steps, format, structure, contents, presentation. b. Referencing style- Various Styles of referencing i.e., APA, MLA etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Egenter, N. (1992). *Architectural Anthropology: Research Series, Anthropologie Architecturale: Serie de Recherches, Architektur-Anthropologie: Forschungs-Reihe.* Structura Mundi. ii. Groat, L. N., & Wang, D. (2013). *Architectural research methods*. John Wiley & Sons. iii. Knowles, C., & Sweetman, P. (Eds.). (2004). *Picturing the social landscape: Visual methods and the sociological imagination*. Routledge. iv. Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.	

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B.Arch. Syllabus
Semester - IX

1.	Department proposing the course	Architecture
2.	Course Title	**Project Management**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP5111**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To make students able to understand the project process in construction. 2. To make students able to manage large scale projects.	
10.	Course Syllabus: **Unit-1: Introduction to Project Management** a. Terminologies, Objectives, Goals and Different Aspects of Management. b. Concepts (Traditional Management and Modern Management). c. Project Programming, Resource Balancing, Phasing of Activities, etc. d. Project Control, Reviewing, Updating and Monitoring. **Unit-2: Construction Management** a. Role of Architect in Construction Management. b. Different Schedules in Construction Management. c. Handling Large Construction Projects and Planning of Construction Sites. d. Feasibility Study. **Unit-3: Contracts** a. Contractual Relationships and Types of Contracts. b. Conditions of Contracts. c. Project Assessment and Project Cost Jobs Size. d. Divisions of Responsibilities, Liasoning with Owners, and their parties. **Unit-4: Project Scheduling and Monitoring-I** a. Introduction to Operation Management. b. Time Estimates. c. Project Scheduling through Gantt's Chart, Bar Chart, Network Analysis, etc. d. Critical Path Method (CPM) and Optimization. **Unit-5: Project Scheduling and Monitoring-II** a. Project Evaluation and Review Technique (PERT). b. Three Time Estimates. c. Probability of Completion of Projects. d. Project Reports, Progress Reports, Construction Financing Facilities, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Chitkara, K. K. (2011). Construction Project Management-Planning, Scheduling and Controlling, Tata McGraw Hills. ii. Loosemore, M. (2003). Essentials of construction project management. UNSW Press. iii. Shrivastava, U. K. (2000). Construction Planning and Management.	

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B.Arch. Syllabus
Semester - IX

1.	Department proposing the course	Architecture
2.	Course Title	**Environmental Planning**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPE5111-1**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-III
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand the principles of environmental planning and management. 2. To inculcate decision-making capabilities with environmental sensitivity.	
10.	Course Syllabus: **Unit-1: Introduction to Environmental Planning** a. Elements of environmental planning. b. Area of environmental planning assessment. c. Spheres of environmental planning i.e., bio-physical environment, socio-economic environment, and built-environment, etc. **Unit-2: Environmental Policies and Legislation** a. The Environmental Protection Act. b. Acts and guidelines such as- The Wildlife (Protection) Act, The Air Act, The Water Act 1974, The Forest Conservation Act, etc. c. Notification on coastal regulation zone. **Unit-3: Evaluating Environmental Quality** Evaluation of factors, control measures, sample collection, testing procedures, national and international case studies of: a. Air Pollution. b. Water Pollution. c. Land Pollution. d. Noise Pollution, etc. **Unit-4: Environmental Impact Assessment Tools** a. Advanced techniques and tools for predicting environmental constraints. b. Importance and methods of Environmental Impact Assessment. c. Introduction to Social Impact Assessment and Economic Impact Assessment. **Unit-5: Case Studies** a. Various international summits. b. Worlds summits to safeguard the environment like Climate Change Commission, Kyoto Protocol, etc. c. National and international examples and awareness programs. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Canter, L. W. (1977). *Environmental impact assessment*. New York: McGraw-Hill. ii. Daniels, T. L. (2019). *The environmental planning handbook for sustainable communities and regions.* London: Routledge. iii. McKinney, M.L & Schoch, R.M. 1996. *Environmental Science System & Solutions*, Web enhanced edition.	

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B.Arch. Syllabus
Semester - IX

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Conservation**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPE5111-2**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-III
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To introduce the technical aspects for the methodological study of historic building systems. 2. To impart the knowledge of conservation techniques and documentation.	
10.	Course Syllabus: **Unit-1: Introduction to Conservation** a. Basic Definitions: Architectural Conservation, Preservation, Restoration, Adaptation, etc. b. Need, Objectives and Scope. c. Role of Government Authorities (ASI, State Archeological Departments, etc.). d. Role of Non-Govt. Organizations (ICOMOS, INTACH, Aga Khan Trust, etc.). **Unit-2: Conservation Principles** a. Conservation Approach, Practice, and its Applications. b. Policies and Legislation. c. Charters: Burra Charter, Venice Charter, Athens Charter, etc. d. Heritage Guidelines. **Unit-3: Conservation Science: Techniques and Technology** a. Causes of Defects. b. Deterioration in Historic Buildings. c. Conservation Interventions. d. Remedial Measures: Cleaning, Maintenance, etc. **Unit-4: Heritage Infrastructure** a. Concepts of Historic Towns, Quarters and Areas. b. Concepts of Heritage Zone/Precincts. c. Concept of Integrated Conservation. d. Values and Ethics in Architectural Conservation. **Unit-5: Conservation Practices** a. Re-use and Redevelopment of Historic Buildings and Areas (Heritage/Tourism). b. Rating and Listing for Heritage structures. c. Case Studies. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Feilden, B. M., & Jokilehto, J. (1998). Management Guidelines for world cultural heritage sites. Rome: ICCROM. ii. Forsyth, M. (2007). Structures & construction in historic building conservation. Oxford: Blackwell. iii. Licciardi, G., & Amirtahmasebi, R. (2012). The economics of uniqueness: Investing in historic city cores and cultural heritage assets for sustainable development. Washington, DC: The World Bank.	

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B.Arch. Syllabus
Semester - IX

1.	Department proposing the course	Architecture
2.	Course Title	**Landscape Architecture**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPE5111-3**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-III
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand the role of Landscape in Architecture. 2. To learn the historical development, planning process of Landscape Design.	
10.	Course Syllabus: **Unit-1: Introduction to the elements of Landscape** a. Scope and Importance in Architecture. b. Elements of Landscape: Natural & Manmade, Earth form, Water, Vegetation, etc. **Unit-2: Plant Materials and Land** a. Understanding the Natural Environment. b. Plant Materials: Types, Characteristics, etc. c. Properties and use of Plant Materials. d. Earthworks and Surveying. **Unit-3: Water and Landscape Structures** a. Water as Element of Landscape. b. Properties and use of water in Landscape. c. Landscape Structures like Trellis, gazebos fencing, pergola, arbors, etc. **Unit-4: History of Landscape Architecture** a. Principles and design philosophy. b. Exposure to Historical Landscape (India, China, Japan, English, French, etc.). **Unit-5: Landscape Design** a. Concepts and Site Development. b. Landscape Design Methods and Detailing. c. Basic Landscape Construction like culverts, walls, etc. d. Irrigation Design and Installation, Drainage, Lighting, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Bring, M, "Japanese Gardens: Design & Meaning", McGraw Hill Book Co., New York, 1981 ii. Christensen, A. J. (2005). Dictionary of Landscape Architecture and Construction. McGraw-Hill. iii. Dee, C. (2001). Form and fabric in landscape architecture: a visual introduction. Taylor & Francis. iv. Jellicoe, G., & Jellicoe, S. (1987). The landscape of man: shaping the environment from prehistory to the present day (p. 8). London: Thames and Hudson. v. Kassler, E. B. (1964). Modern gardens and the landscape. vi. Littlewood, M. (2012). Landscape Detailing Volume 4 (Vol. 4). Routledge. vii. Motloch, J. L. (2000). Introduction to landscape design. John Wiley & Sons. viii. Reid, G. (2012). Landscape graphics: plan, section, and perspective drawing of landscape spaces. Watson-Guptill.	

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B.Arch. Syllabus
Semester - IX

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Thesis-I (Dissertation)**
3.	L-T-P Structure	0-8-4
4.	Credits/# of period	10/12
5.	Course number (Code)	**ARPC5121**
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 study and understand how to do an Architectural Research/Design. 2. To develop the skill for visual and verbal presentation of work.	
10.	Course Syllabus: The course is the first part of architectural thesis which exhibits the ultimate crux of architectural knowledge gained by a student in the entire course of B. Arch. This part focuses on the preliminary studies and methodology that are imperative for a good thesis on architecture. This course will give opportunity to students to harness their research abilities on identifiable domain and demonstrate the research as application for a design project in the same identifiable manner. The thesis project shall be done and assessed as per the 'Thesis Manual' prepared by the Department time to time. The work shall be done on any topic, known theories, established practices, etc. related to the field of architecture. It is advisable that the selected topic may have relevance with the proposed topic of thesis to be done in Part II of the course. This course, will, in general, but not exhaustively, contain formulation of Theme and Topic, Secondary study on Theme and Topic, Collection and Analysis of secondary data, formation of Design Brief and Identification of sources for primary data collection, Preparation of Questionnaire for primary Data Collection, Preliminary selection of Site and Analysis of Site for Architectural Thesis II. *The deliverables shall be in form of Presentation, Report, Portfolio, Sketches, Models, etc.*	
11.	References: - i. Bloomberg, L. D., & Volpe, M. (2018). *Completing your qualitative dissertation: A road map from beginning to end.* ii. Boote, D. N., & Beile, P. (2005). *Scholars before researchers: On the centrality of the dissertation literature review in research preparation. Educational researcher*, 34(6), 3-15. iii. Herr, K., & Anderson, G. L. (2014). *The action research dissertation: A guide for students and faculty.* Sage publications. iv. Lester, J. D., & Lester, J. D. (2012). *Writing research papers: A complete guide* (p. 416). Pearson. v. Rudestam, K. E., & Newton, R. R. (2014). *Surviving your dissertation: A comprehensive guide to content and process.*	

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B.Arch. Syllabus
Semester - IX

1.	Department proposing the course	Architecture
2.	Course Title	**Seminar**
3.	L-T-P Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**AREP5121**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To undertake research individually in each subject relating to architecture and present research process through seminars and reports. 2. To equip the students to develop analytical, presentation and writing skills.	
10.	Course Syllabus: Seminars are intended to develop the capacity of students to undertake a research in a given subject relating to architecture and allied domain. It is divided in two parts: Seminar I (Review a Paper or a Book): The students will select a paper from a reputed journal or a book on a topic related to Architecture for review. This will help students to understand, analyze, reproduce, and review the technical papers or a book in the form of review report. This review writing is aimed at understanding the method of writing, organization and presentation of arguments attempted by the author of the paper or book. Seminar II (Systematic Study): The students will identify any study area and conduct a systematic study. This may include Appreciation, Critical Appraisal of Architectural projects or Architect's philosophy or any other topic. This would include analytical study of the subject through literature study, data collection, interpretations, observations, analysis, discussion, etc. *The deliverables shall be in form of oral presentation, visual presentations, reports, etc.*	
11.	References: - i. Andrew Knight Editor and Les Ruddock, "*Advanced Research Methods in the Built Environment*", Wiley-Blackwell, 2008 ii. Cozby, Paul C. (2001), "*Methods in Behavioral Research', Seventh Edition. Mountain View: Mayfield Publishing*. Web Resources: http://methods.fullerton.edu/ iii. D. G. Evans, Paul Gruba and Justin Zobel, "*How to write a better thesis*",Carlton, Vic. : Melbourne University Press, 2011 iv. Groat L. and D. Wang, "*Architectural Research Methods*", New York: Wiley, 2002 v. Leach N., "*Rethinking Architecture*", London Routledge 2004 vi. Linda L. Nussbaumer, "*Evidence-based design for interior designers*",New York : Fairchild ; Oxford : Berg distributor, 2009 vii. Nesbitt K., *"Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995'*, New York: Princeton Architectural Press, 1996 viii. Peter Hamilton, "*Visual research methods*", London: Sage, 2006 ix. Richard F. Fellows and Anita M. M. Liu, "*Research Methods for Construction", 4th Edition* Oxford: Wiley-Blackwell, 2004 x. Taeke M. de Jong and D. J. M. van der Voordt, "*Ways to study and research urban, architectural, and technical design*", Delft, The Netherlands: DUP Science, 2002 xi. Whyte, William Foote, "*Learning from the Field*", Thousand Oaks, CA: Sage, 198	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Professional Practice**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP5211**
6.	Status (Core/Essential/Elective)	Essential Program Requirements (EPR)
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand the legalities involved in Architectural Profession and to develop professionalism, integrity, and competency. 2. To learn the process of Tenders and Contracts.	
10.	Course Syllabus: **Unit-1: Architectural Profession** a. Difference between Profession and Business. b. Various Professional Bodies for Architects. c. Architects Act 1972 with Amendments. d. Council of Architecture, its role, and responsibilities. **Unit-2: Professional Ethics** a. Code of professional conduct. b. Condition of engagement and scale of professional fees. c. Copyright Act as applicable to architectural work. d. Architectural competitions. **Unit-3: Contracts and Tenders** a. Types of tenders, process of calling tenders and selection process. b. Pre-Tender qualifications and registration. c. Concept of Contract, types of contract and process of contract filing. d. Duties and liabilities of Architects, Clients, and Contractors. **Unit-4: Legal Procedures and Legislation** a. Articles of Agreement, Execution of Works, and Schedule of Payments. b. The Arbitration and Conciliation Act, 1996 with Amendments. c. Right of Easements- The Indian Act of Easements 1882 with Amendments. **Unit-5: Architects' Office Management** a. Professional Practice; Office Management, Office Structure, Filing, Documentation and Working. b. Tax- liability. c. Role of Design Staff and Supporting Managerial Staff; Personal Management and Training Responsibilities. d. Procedure of Operation in Government Organization. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Apte, V. S. (2008). Architectural Practice and Procedure. Pune: Padmaja Bhide. ii. COA. (2020). Handbook of Professional Documents. Council of Architecture. iii. Namavati, R. (1984). Professional practice. Mumbai: Lakhani Book Depot.	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Physical Planning Theory and Techniques**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP5212-1**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-IV
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To make students aware of physical planning as a field of specialization. 2. To equip the students with the knowledge of spatial planning interventions.	
10.	Course Syllabus: **Unit-1: Landuse-I** a. Landuse Theories Such as Concentric Zone Theory, Multiple Nuclei Theory, etc. b. Landuse Planning Approaches Such as Incremental Approach, Rationalistic Approach, etc. c. Landuse Patterns and Classifications. d. Indicators in Physical Planning Such as Social Indicators, Performance Indicators, etc. **Unit-2: Landuse-II** a. Physical Planning Concepts. b. Goals of Landuse Planning. c. Landuse Zoning, Conversions and Regulations. d. Compatible and Incompatible Landuse. **Unit-3: Site Planning** a. Site Research and Community Engagement. b. Neighborhood Planning. c. Form-Based Spatial Planning. d. Performance Zoning and TOD. **Unit-4: Delineation Techniques** a. Different Spatial Delineation Techniques Such as Weighted Index Number Method, Variable Index Method, Cluster Method, etc. b. SWOT Analyses. c. Feasibility Analyses and Cost-Benefit Analysis. d. Land Suitability Analyses. **Unit-5: Central Place Theory** a. Range and Threshold. b. Principles of Spatial Arrangement of Central Places. c. Different Graphical Techniques such as Scalogram, Sociogram, Graph Theory, etc. d. Threshold Analyses. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Allmendinger, P. (2009). *Planning Theory. 2.* Utgave. ii. Bandyopadhyay, A. (1997). *Textbook of town planning. India*: Books and Allied Ltd. iii. Crane, R., & Weber, R. (Eds.). (2015). *The Oxford handbook of urban planning.* Oxford University Press. iv. Levy, J. M. (2016). *Contemporary urban planning.* Taylor & Francis. v. Gallion, A. B. and Simon E. *Urban Pattern: City Planning and Design*, , CBS Publishers.	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Sustainable Cities and Communities**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP5212-2**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-IV
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To impart the knowledge and skills to develop sustainable cities and communities. 2. To learn human physical, social, and psychological needs in urban and rural communities.	
10.	Course Syllabus: **Unit-1: Urbanization** a. Cultural and Social Transformation. b. Sustainability in Urban Governance. c. Urban Public Finance and Taxation. **Unit-2: Urban Systems** a. Urban Risks and Vulnerabilities. b. Law, Order and Conflicts. c. Management and Planning. **Unit-3: Urban Environment** a. Air, Water, Food and Natural Resources. b. Urban Agriculture for Sustainable Cities. c. Climate Impacts, Adaptation and Mitigation. d. Brownfield Regeneration. **Unit-4: Sustainable Urban Services and Infrastructure** a. Sustainable Environmental Services and Infrastructure. b. Sustainable Transport Planning. c. Sustainable Urban Energy Systems. **Unit-5: Case Studies** a. Best Practices. b. National and International case studies. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Castles, S. (2001). *Development, social transformation, and globalisation. Centre for Asia Pacific Social Transformation Studies*, University of Wollongong. ii. Dixon, T., Raco, M., Catney, P., & Lerner, D. N. (Eds.). (2008). *Sustainable brownfield regeneration: Liveable places from problem spaces.* John Wiley & Sons. iii. Haughton, G., & Hunter, C. (2004). *Sustainable cities*. Routledge. iv. Hutton, B. (2013*). Planning Sustainable Transport*. Routledge. v. Jenks, M., & Dempsey, N. (2005*). Future forms and design for sustainable cities*. Routledge. vi. Nijkamp, P., & Perrels, A. (2014). *Sustainable cities in Europe*. Routledge.	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Human Settlement and Spatial Organization**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**AREP5212-3**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-IV
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand various elements, classifications, and typology of Human Settlements. 2. To familiarize with the process of evolution of cities and their concepts. 3. To understand the settlement patterns and growth.	
10.	Course Syllabus: **Unit-1: Evolution of Settlement patterns: Pre-Industrial Revolution** a. Ekistics, its role and understanding. b. Role of society in evolution of human settlement. c. Early rural and urban settlements. **Unit-2: Evolution of Settlement patterns: Post-Industrial Revolution** a. Various concepts and theories. b. Role of technology in evolution of human settlement. c. Analysis of settlement patterns and its growth magnets. **Unit-3: Spatial Organization and culture.** a. Organization based on community practices. b. Place memory and its role in Spatial Organization. c. Concept of Dynapolis, Futuristic cities, Utopic City, etc. **Unit-4: Morphology and city boundaries.** a. Factors responsible for city forms. b. City Form – Advantages and Disadvantages. c. Growth potential based on morphology. **Unit-5: People and City** a. Regeneration of Urban city cores. b. Social and Physical Boundary. c. Settlement as Organism, Quality of Life, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Bertaud, A. (2018). *Order Without Design: How Markets Shape Cities*. United States: MIT Press. ii. Bowen, W. M., Gleeson, R. E. (2018). *The Evolution of Human Settlements: From Pleistocene Origins to Anthropocene Prospects. Germany*: Springer International Publishing. iii. Doxiadēs, K. A. (1968). *Ekistics: An Introduction to the Science of Human Settlements*. United States: Oxford University Press. iv. Hanson, J. (2003). *Decoding Homes and Houses*. United Kingdom: Cambridge University Press. v. Hillier, B., Julienne, H. (2014). *The Social Logic of Space*. (n.p.): Cambridge University Press. vi. Gruyter D. (2014). *Spatial Analysis and Social Spaces: Interdisciplinary Approaches to the Interpretation of Prehistoric and Historic Built Environments*. Germany.	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Remote Sensing and Basic of GIS**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPE5211-1**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-V
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To introduce a multidisciplinary field of Remote Sensing and GIS. 2. To learn mapping and modelling the present and future scenario based on the current trends.	
10.	Course Syllabus: **Unit-1: Introduction** a. Introduction to Remote Sensing. b. Thermal Bands, Scales and Resolution. **Unit-2: Image Processing** a. Image Processing such as Image Restoration, Image Enhancement, Image Classifications, etc. c. Photogrammetry. **Unit-4: Geographic Information Systems** a. Introduction to GIS. b. GIS Data (Vector and Raster). c. Use of GPS in GIS. d. Crowd Sourcing and Mobile Mapping. **Unit-3: Maps in GIS** a. Coordinate Systems. b. Projections. c. Thematic Maps and Layers. **Unit-5: Applications of Remote Sensing and GIS** a. Geospatial database creation such as preparation of base maps, attribute tables, etc. b. GIS mapping and modelling such as urban growth modelling, urban utility mapping, etc. c. Applications of GIS. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Bhatta, B. (2008). *Remote sensing and GIS*. Oxford University Press, USA. ii. Cook, E. A. (1995). *Remote sensing and image interpretation: Thomas M. Lillesand and Ralph W. Kiefer, 3rd edn.*, Wiley, New York, 1994, 750 pp., ISBN 0-471-57783-9. iii. Dale, M. R., & Fortin, M. J. (2014). *Spatial analysis: a guide for ecologists.* Cambridge University Press. iv. Goodchild, M. F., Longley, P. A., Maguire, D. J., & Rhind, D. W. (2005). *Geographic information systems and science.* Wiley & Sons, West Sussex, UK, 17, 517. v. Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). *Remote sensing and image interpretation*. John Wiley & Sons. vi. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2005). *Geographic information systems and science*. John Wiley & Sons. vii. Netzband, M., Stefanov, W. L., & Redman, C. (Eds.). (2007). *Applied remote sensing for urban planning, governance, and sustainability*. Springer Science & Business Media.	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Building Certification and Rating Systems**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPE5211-2**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-V
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To give understanding of different rating and certification agencies. 2. To learn the importance of rating in building industry.	
10.	Course Syllabus: **Unit-1: Introduction** a. Idea and concept of Rating Systems. b. Importance of rating systems. c. National and International Rating Systems. d. Environmental, Economic, and Social Parameters in Building Rating Tools. **Unit-2: Certification** a. Introduction to Certification. b. ECBC, Fire Certification, etc. c. Universal Design, Social Responsiveness, etc. **Unit-3: Indian Green Building Rating Systems** a. Government Rating Systems like GRIHA, BEE, etc. b. Private Rating Systems like IGBC, LEED-India, etc. **Unit-4: International Green Building Rating Systems** a. International Green Construction Code. b. Building Research Establishment Environmental Assessment Method (BREEAM). c. Building Owners and Managers' Association (BOMA-360), WELL, etc. **Unit-5: Other Certifications and Rating Systems** a. Comprehensive Assessment System for Built Environment Efficiency (CASBEE). b. ASSOCHAM GEM Green Building Council, etc. c. Leadership in Energy and Environmental Design (LEED). d. German Sustainable Building Council (DGNB - abbreviation in German) certification, etc. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. MNRE, T. (2010). *GRIHA Manual, Volume 1: Introduction to National Rating System-GRIHA, An E-valuation Tool to Help Design, Build, Operate, and Maintain a Resource-efficient Built Environment.* New Delhi, India. ii. Reeder, L. (2010). *Guide to green building rating systems: understanding LEED, Green Globes, Energy Star*, the National Green Building Standard, and more (Vol. 12). John Wiley & Sons. iii. Steinfeld, E., & Maisel, J. (2012). *Universal design: Creating inclusive environments.* John Wiley & Sons. iv. Yudelson, J. (2009). *Green Building Through Integrated Design (Green Source Books).* McGraw-Hill Education.	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Building Economics and Sociology**
3.	L-T-P Structure	3-0-0
4.	Credits/# of period	3/3
5.	Course number (Code)	**ARPE5211-3**
6.	Status (Core/Essential/Elective)	Professional Elective (PE)-V
7.	Pre-requisites (course no./title)	NIL
8.	Frequency of offer	Annual
9.	Course Objectives (CO): 1. To understand the effects of Sociology and Economics in Architecture. 2. To learn various sociological and economic concepts.	
10.	Course Syllabus: **Unit-1: Basic Concepts of Economics** a. Broad concepts and theories of Economics. b. Factors of production linked to architecture such as Land, labor, Money, Market, etc. c. Laws of Demand and Supply. **Unit-2: Building Economics** a. Building efficiency and Cost reduction through planning. b. Relationship of economics and built environment. c. Theories of Land values such as Bid rent theory, concentric zone model etc. **Unit-3: Economic analysis of Projects** a. Financing for projects, source of capital. b. Basic concept of interest, capital, Internal rate of return and present value of assets. c. Cost benefit analysis. d. Law related to properties and building such as Rent Control Act, RERA Act, etc. **Unit-4: Basics of Sociology** a. Introduction to sociology. b. Basic concepts- Society, Group, Community (Rural and Urban), Association, Institution. c. Concept of society and its types – rural and urban. **Unit-5: Sociology and Architecture** a. Sociology of space and built environment. b. Urban rural migration and Urbanization. c. Dynamics of Urban growth and society. *The assignments may be in form of sketches, term-papers, reports, drawings, presentations, etc.*	
11.	References: - i. Abraham M. F. (2014). *Contemporary Sociology: An introduction to Concepts and Theories* Oxford Publication. ii. Chaudhuri, S. and Sen, A. (2010). *Economics.* McGraw Hill iii. Dewett, K. K. (2009). *Modern Economic Theory*. S. Chand Publications. iv. Jones, Paul (2011). *The Sociology of Architecture: Constructing Identities*. Liverpool University Press. v. Smell, M. *Cost – benefit Analysis – a practical guide*. Thomas Telford Publishing vi. Teck, H. and Hian, O. (1998). *Economics: theory and applications*. Taiwan: McGraw-Hill.	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Architectural Thesis-II**
3.	L-T-P Structure	0-8-4
4.	Credits/# of period	10/12
5.	Course number (Code)	**ARPC5221**
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 demonstrate design and/or research abilities through the knowledge acquired in the entire program.	
10.	Course Syllabus: The students are expected to demonstrate their Design/Research abilities through an Architectural Thesis Project. The Design/Research development may be based on a certain 'theme' as the primary focus of study. The thesis project shall be done and assessed as per the 'Thesis Manual' prepared by the Department time to time. The process for Design Thesis, Project will include – Description, Case Study, Site Study- Analysis and Inferences, Development of specific Design Guidelines, Design Program and Area Requirements, Conceptual Development, Design Development, Final Design, Presentation, etc. For Research/Study Thesis, it would be an in-depth analysis of various facets of architectural design and built environment. It may include system development, critique of design and trends in building industry, application of various new technologies, best practices, sustainable development, heritage management and conservation, etc. *The deliverables shall be in form of Presentation, Report, Portfolio, Sketches, Models, etc.*	
11.	References: - i. Bloomberg, L. D., & Volpe, M. (2018*). Completing your qualitative dissertation: A road map from beginning to end.* ii. Boote, D. N., & Beile, P. (2005). *Scholars before researchers: On the centrality of the dissertation literature review in research preparation. Educational researcher,* 34(6), 3-15. iii. Herr, K., & Anderson, G. L. (2014). *The action research dissertation: A guide for students and faculty.* Sage publications. iv. Lester, J. D., & Lester, J. D. (2012). *Writing research papers: A complete guide* (p. 416). Pearson. v. Rudestam, K. E., & Newton, R. R. (2014). *Surviving your dissertation: A comprehensive guide to content and process.*	

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B.Arch. Syllabus
Semester - X

1.	Department proposing the course	Architecture
2.	Course Title	**Comprehensive Viva**
3.	L-T-P Structure	0-2-0
4.	Credits/# of period	1/2
5.	Course number (Code)	**ARPC5221**
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 assess the comprehensive knowledge of the students as a part of their holistic development process throughout the degree program.	
10.	Course Syllabus: All the courses in B.Arch. program are designed to cover a vast range of fields of studies and develop all-round skills for designing and executing any architectural project. The courses also cover the areas which may help the students to choose the domain for their higher studies. The viva-voce shall be conducted to assess the overall knowledge and understanding of the courses taught to the students in the entire program including their participations and learnings through various co-curricular activities, extra-curricular activities, design competitions, etc. The viva-voce shall be conducted by a panel constituting institute's faculty. The viva-voce may contain the questions on any of the courses undergone during the entire B.Arch. degree program.	