



**DEPARTMENT OF ARCHITECTURE
NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR**

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

राष्ट्रीय प्रौद्योगिकी संस्थान रायपुर,

जी. ई. रोड, रायपुर, 492010 छ.ग.

Phone: (0771) 2255475, Fax: (0771) 2254600, Website: www.nitr.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):	<ol style="list-style-type: none"> 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:	<p>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.</p> <p>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.</p> <p>The exercises shall include Basic Design 2d-3d composition, with various philosophies. Understanding Anthropometry, Ergonomics, Nature Drawings, Free Hand Sketching, etc. shall be incorporated.</p> <p>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.</p>
11.	References:	<ol style="list-style-type: none"> 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, Longman 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):	<p>1. To introduce fundamentals of building construction materials, their properties, application, components and their construction techniques.</p> <p>2. To focus on various building materials, latest trends in practice and usage of new technologies/materials.</p>
10.	Course Syllabus:	<p>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.</p> <p>Unit-1: Measure drawings and Introduction to Super and Sub- Structure</p> <p>a. Introduction to basic elements and components of buildings and their importance.</p> <p>b. Brief discussion on step wise process of building a structure.</p> <p>c. Basics of section of G+1 building.</p> <p>d. Soils – Types and Properties.</p> <p>Unit 2: Basic Building Materials</p> <p>a. Sand, Cement, Aggregate, Lime, Moorum, Surkhi, Fly Ash, Terracotta, Porcelain, etc.</p> <p>b. Bamboo and Timber.</p> <p>Unit 3: Introduction to Materials of Earth Architecture</p> <p>a. Use of Earth in buildings – Adobe Construction, Rammed Earth Construction, etc.</p> <p>b. Tiles – Types, Uses, etc.</p> <p>c. Bricks – Types, Class, Uses, etc.</p> <p>d. Mortars –Mud</p> <p>Unit 4: Brick Masonry</p> <p>a. Brick Walls and Bonds – Header, Stretcher, English, Flemish, Rat-Tap, Silver Lock, etc.</p> <p>b. Brick Foundations, Piers and Thresholds.</p> <p>c. Brick Lintels, Arches and Vaults.</p> <p>d. Jointing, Pointing, etc.</p> <p>e. Cement, Lime,</p> <p>Unit 5: Stone Masonry</p> <p>a. Stone Walls – Rubble, Random Rubble, Course, etc.</p> <p>b. Stone Foundations and Thresholds.</p> <p>c. Stone Arches, and Vaults.</p> <p><i>Note: Deliverable shall be in form of portfolio/sheets/models/reports/multi-media presentations, etc. with hands-on experience.</i></p>
11.	References:	<p>i. Barry, R. (1999). The Construction of Buildings Series. 5th Ed. New Delhi: East-West Press.</p> <p>ii. Ching D.K. (2014). Building Construction Illustrated. 5th Ed. NJ: John Wiley and Sons</p> <p>iii. Chudley, R. (2008). Building Construction Handbook. 7th Ed. London: Butterworth-Heinemann.</p> <p>iv. Foster, J. and Mitchell, S. (1963). Building Construction: Elementary and Advanced, 17th Ed. London: B.T. Batsford Ltd.</p> <p>v. McKay, W. B. (2005). Building Construction Metric Series. I–V. Mumbai: Orient Longman.</p> <p>i. Moxley, R. (1961). Mitchell's Elementary Building Construction. London: B. T. Batsford.</p> <p>vi. Punmia, B.C. and Jain, A. K. (2016). Building Construction. 11th Ed. New Delhi: Laxmi Publications.</p> <p>vii. Rangwala, S. C. (2017). Engineering Materials: Material Science. 43rd Ed. Anand: Charotar Publishing House Pvt. Ltd.</p> <p>viii. Rangwala, S. C. (2019). Building Construction 33rd Ed. Anand: Charotar Publishing House Pvt. Ltd.</p> <p>ix. Sushil-Kumar, T. B. (2003). Building Construction. 19th Ed. Delhi: Standard Publishers.</p>



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B.Arch Syllabus
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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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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):	<ol style="list-style-type: none"> 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:	<p>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.</p> <p>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.</p> <p>Deliverable shall be in form of practical models/ workshop reports/ lab file, etc.</p>
11.	References:	<ol style="list-style-type: none"> 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.	