

Course Structure and Syllabi
For
Bachelors Programmes
(B.Arch.)
First Year



राष्ट्रीय प्रौद्योगिकी संस्थान हमीरपुर
National Institute of Technology Hamirpur
Hamirpur- 177 005 (India)
<http://www.nith.ac.in>
July, 2023 Onwards

First Year

1 st Semester									2 nd Semester						
SN	Code	Subject	L	T	P	D	Credits	SN	Code	Subject	L	T	P	D	Credits
1	AR-111	Architectural Design-I	0	0	0	8	8	1	AR-121	Architectural Design-II	0	0	0	9	9
2	AR-112	Building Construction & Materials-I	0	0	0	4	4	2	AR-122	Building Construction & Materials -II	0	0	0	4	4
3	AR-113	History of Architecture-I	3	1	0	0	4	3	AR-123	History of Architecture-II	3	1	0	0	4
4	AR-114	Architectural Drawing & Graphics-I	0	0	0	6	6	4	AR-124	Architectural Drawing & Graphics-II	0	0	0	6	6
5	AR-115	Disaster Management	3	1	0	0	4	5	AR-125	Architectural Workshop	0	0	3	0	3
6	MA-112	Architectural Mathematics	3	1	0	0	4	6	HS-104	Communication Skills	2	0	2	0	4
Total			Hours = 30				30	Total			Hours = 30				30

Department of Architecture

Course Name: Architectural Design-I		
Course Code: AR-111		
Course Type: Professional Core (PC)		
Contact Hours/Week: 8D		Course Credits: 06
Course Objective		
To Train the students in visual compositions by using various elements of Design and to make them familiar with the meaning and purpose of Architectural design		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Basic Design, Concept of design in everyday life, Objectives of design, Elements of design, Principles of Design.	14D
UNIT-02	Detailed study of color theory and its applications through geometric compositions. Principles of design such as Scale- Balance- Proportion- Rhythm- Harmony- Contrast- etc. Application of the same through exercises in two and three-dimensional compositions; using single and multiple types of elements.	30D
UNIT-03	Floor tile design, carpet, mural, door paving patterns, Sky line of city/village, Experience in 3D Design, compositions with simple forms like cube, cuboids, cylinder, cone, prism etc., Compositions with 3-D Solids.	26D
UNIT-04	Introduction to Anthropology, Anthropometric data for adults & children: Standing position front & side arms extended- various seating positions-various working positions. Habitable space such as Living Room, Dining Room, Bedroom, Kitchen & Toilet with furniture layout.	26D
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Introducing the basics of Architectural profession.		
CO2: Describe the process of design.		
CO3: Learn the various human dimensions and its applications.		
CO4: Application of the process of design.		
Books and References		
1. Design through Discovery by M.E. Bevin, Harcourt Brace College Publishers, University of Wisconsin, 1994.		
2. Drawing and Perceiving by Douglas Cooper, John Wiley & Sons, New York, 2007.		
3. Principles of Design in Architecture by K.W. Smithies, Van Nostrand Reinhold, New York, 1981.		
4. Architectural Drawing Masterclass by Tom Porter, Charles Scribner's, London, 1993.		
5. Time-Saver Standards for Architectural Design: Technical Data for Professional Practice by Michael J. Crosbie and Donald Watson, McGraw-Hill, New York, 2005.		
6. Time Saver Standards for Building Types by Joseph De Chiara and Michael J. Crosbie, McGraw-Hill, New York, 2001.		
7. Architectural Graphic Standards by Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons, New York, 2008.		
8. Form Space & Order by Francis DK Ching, John Wiley & Sons, New Jersey, 2015		

Department of Architecture

Course Name: Building Construction & Materials – I	
Course Code: AR-112	
Course Type: Building Sciences and Applied Engineering (BS and AE)	
Contact Hours/Week: 4D	Course Credits: 04

Course Objective

To familiarize the students with basic building materials and their construction details.

Unit Number	Course Content	Lectures
UNIT-01	Behavioral characteristics and applications of basic building materials- brick, stone, lime, cement, sand: Application, properties, and defects. Building components- wall, floor, roof, and foundation; construction terminology through the typical section. Effects of sun, rain, wind, and other climatic and environmental conditions on building materials and the built environment.	10D
UNIT-02	Stones- Process of rock formation, types, properties, applications etc. Various kinds of stones used for Building Construction, their properties, applications, etc. Stone masonry Detail drawings of various types such as Rubble walling, Polygonal walling, Flint walling, Ashlars walling, Masonry joints, Stone arches, Maintenance etc. Bricks – Constituents and properties of soil, manufacturing, types, sizes, properties and uses.	10D
UNIT-03	Building construction techniques in brick and stone masonry Various types of bonding in walls such as Stretcher bond-English bond-Single & Double Flemish bond etc. These bonds are to be explained with respect to varying wall thicknesses such as ½ brick-1 brick- 1½ brick, etc., and various types of junctions such as L junction- T junction- Cross junction, etc. Stone masonry of various types, such as Rubble walling, Polygonal walling, Flint walling, Ashlars walling, Masonry joints, Maintenance, etc.	14D
UNIT-04	Lime and cement: Sources, classification, properties, hydration, method of manufacturing, testing, mixing, and uses. Cement: Manufacturing process, physical and chemical properties, classification of cast-in-situ and precast systems. Foundation, column & beam structure, lintels, sunshades, floor and roof slabs in concrete, granolithic flooring, CC blocks (solid & hollow), fly ash bricks as a walling material, cement bonded particle boards. Different grades, composition, preparation, and properties of cement mortar. Use and selection of mortar for different construction work.	14D
Note:	Site visits, case studies, and educational tours may be organized.	

Course Outcomes

Upon successful completion of the course, the students will be able to

CO1: Study of building materials.

CO2: Understand the Constituents, properties, and Manufacturing process of building materials

CO3: Learn to draw brick masonry and stone masonry

Books and References

1. "Building Construction", Sushil Kumar, Standard Publishers Distributors, New Delhi, 2006.
2. "Building Construction Metric" Vol. 1-2, W.B.Mckay, Orient Longman Private Limited, Mumbai, 2006.
3. "Building Construction Illustrated", Francis D.K. Ching, John Wiley & Sons, 2007, 2011.
4. "Construction Technology", Vol. 1, Roy Chudley, Roger Greeno, Prentice Hall (UK), 2005.
5. "Appropriate Building Materials", Roland Stulz, Kiran Mukerji, SKAT, 1993.
6. "A Textbook of Building Construction", S.P. Arora and S.P. Bindra, 4th Edition, Dhanpat Rai, Delhi, 1996.

Department of Architecture

Course Name: History of Architecture-I		
Course Code: AR-113		
Course Type: Professional Core (PC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To understand evolution and development of architectural and urban built environment in context to geophysical, social and technological factors.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Indus Valley civilization. Study of architectural characteristics. Introduction to the Vedic village. Study of its building typology and construction.	06L
UNIT-02	Introduction to Buddhist settlement in India. Detailed studies of Architectural characteristics of various building types such as Stupas, Chaityas and Viharas through suitable examples from each geographical context to illustrate differences in Form, Construction methods and Ornamentation.	06L
UNIT-03	Study of evolution of Hindu architecture, Rock-cut and structural forms and comparison of Temple forms in various regions of India. Study of various styles of temples such as Dravidian and Nagara Style with its regional sub categories with respect to functional components, architectural Form, construction and ornamentation.	12L
UNIT-04	Study of Islamic architecture in various Era's from provincial styles to Mughal architecture. Delhi or Imperial Style: Slave, Khilji, Tughlaq, Sayyed, Lodhi. Provincial Style: Bengal, Jaunpur, Deccan, Malwa, Bijapur. Mughal Architecture in North India under: Humayun, Akbar, Jehangir, Shahjahan.	12L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the architectural characteristics of Indus Valley civilization and Vedic village		
CO2: Understand the architectural characteristics of Buddhist settlement in India		
CO3: Understand the evolution of Hindu architecture.		
CO4: Understand various architectural styles.		
Books and References		
1. Architecture in India by Marilia Albanese, Sandeep Prakashan, Indore, 2001.		
2. Hindu India by Henri Stierlin, Taschen, Cologne, 1998.		
3. Ancient Indian Architecture by Sanjeev Maheshwari and Rajeev Garg, CBS Publishers & Distributors, Delhi, 2001.		
4. The Hindu Temple by R. Champakalakshmi and Usha Kris, Roli Books, Delhi, 2000.		
5. The Architecture of India: Buddhist and Hindu by Satish Grover, Vikas Publishing House Pvt. Ltd, India, 1980.		
6. Islamic Architecture in India by Satish Grover, Galgotia Publishing Company, Delhi, 1996.		

Department of Architecture

Course Name: Architectural Drawing and Graphics-I		
Course Code: AR-114		
Course Type: Professional Core (PC)		
Contact Hours/Week: 6D		Course Credits: 04
Course Objective		
To familiarize the student with basic knowledge of drafting, lettering techniques and visualization of geometric forms		
Unit Number	Course Content	Lectures
UNIT-01	Significance and Scope, Usage of Drawing Instruments, Dimensions, Scales, Free hand Lettering, Line types such as Elevation lines- Construction lines – Section lines – Hidden lines – Centre lines Introduction to pencils with different grades such as F, H, HB, 2B, 4B and 6B. Representation of the different lines created by the different pencils by varying thickness and pressure. Representation of various textures with thick, thin and flat pencils Strokes. Illustrative examples to be followed explaining the various techniques.	18D
UNIT-02	Introduction to Orthographic projections, First angle projection. Projection of line parallel to both reference planes / parallel to one and inclined to other reference plane / inclined to both the reference planes followed by illustrative examples in each case. Projection of plane parallel to VP / parallel to HP / perpendicular to VP and inclined to HP/ perpendicular to HP and inclined to VP / inclined to both HP and VP followed by illustrative examples in each case. Introduction to solids bounded by plane surfaces such as prisms / pyramids and solids of revolution such as cylinders / cones, Projection of solids having axis perpendicular to one of the reference planes /axis parallel to either of the reference plane and incline to other reference plane / axis inclined to both the reference planes followed by illustrative examples in each case.	36D
UNIT-03	Introduction and Importance, Method of drawing, Sciography of points, lines, planes and solids followed by illustrative example in each case.	18D
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Use of Drawing Instruments and pencils of various grades.		
CO2: Learn to draw plan, front elevation and side elevations.		
CO3: Learn to draw shades and shadows in plan, front elevation and side elevations.		
Books and References		
1. A Textbook of Engineering Drawing by Prof. P.J. Shah, S. Chand Publishing, 2008.		
2. Engineering Drawing with an Introduction to AutoCAD by Dhananjay A. Jolhe, Tata McGraw Hill, 2007.		
3. Architectural Graphics by Francis D. K. Ching, Wiley; 5th Edition, 2009.		
4. Architectural Shades and Shadows by Henry McGoodwin, Nabu Press, 2010.		
5. Rendering with Pen and Ink by Robert W. Gill, Thames & Hudson Ltd., 1984.		
6. Architectural Drawing by Tom Porter, Hamlyn, 1990.		

Department of Architecture

Course Name: Disaster Management		
Course Code: AR-115		
Course Type: Professional Ability Enhancement Compulsory Course (PAECC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To let the students understand the type of natural disasters and its effects on structural and non-structural elements. To understand the mechanism involved in the management of disasters.		
Unit Number	Course Content	Lectures
UNIT-01	Ecosystem- natural and man-made ecosystem; Ecological principles; Concepts of Environmental Impact Analysis.	07L
UNIT-02	Introduction to Natural Disasters. Introduction to disaster management, Rules and Notification. Natural Disasters: Earthquakes, Floods, River Erosion, Cyclones, Tsunami, Landslides & Avalanches Forest Fires. Man induced Disasters: Introduction, Nuclear Disaster, Chemical, Mine Disaster, Biological Disaster, Cyber Terrorism, and Environmental Disaster.	09L
UNIT-03	Planning for Disaster: Guidelines for disaster management of Floods, River Erosion, Cyclones Tsunami, Landslides & Avalanches Forest Fires.	14L
UNIT-04	Fire Service, Forecasting & Early Warning Communications & IT Co-ord. with Scientific Organizations. Spatial Data Management, Risk Transfer, Microfinance, Role of Corporate, Role of NGOs, Community Preparedness and Education, Gender Issue, Vulnerable Groups. Urban Development, Civil Defense, Home Guards, NCC, NSS, NYK Medical Preparedness, Public Awareness	06L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand Natural Disasters and concept of Disaster Management		
CO2: Understand the details of Man induced Disasters		
CO3: Learn the Planning process for Disaster Mitigation		
CO4: Learning the various details of Disaster Management		
Books and References		
1. Elements of Ecology by Thomas M. Smith and Robert Leo Smith, Pearson, 2014		
2. Disaster Management in the Hills by Dr. Satendra, Concept Publishing Company, 2003.		
3. Disaster Management by Harsh K. Gupta, Universities Press, 2003.		
4. Natural Hazards and Disaster Management: Vulnerability and Mitigation by R. B. Singh, Rawat, 2006.		
5. Disaster Risk Reduction in South Asia by Pardeep Sahni, Ariyabandu and Madhavi Malalgoda, PHI Learning, 2003.		

Department of Mathematics & Scientific Computing

Course Name: Architectural Mathematics		
Course Code: MA-112		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
<ul style="list-style-type: none"> • To understand concepts of linear algebra and its applicability in different engineering fields. • To understand the meaning of the derivative in terms of a rate of change and should be able to use derivatives to solve a variety of problems. • To able to model a written description of a physical situation with a function, or a differential equation. • To introduce the concepts of plane, sphere, cone and cylinder and their utility in the field of architectures. • To develop an appreciation of calculus as a coherent body of knowledge and as a human accomplishment. 		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Linear Algebra: Matrices, Equivalent Matrix, Elementary Matrix, Normal form of a matrix, Gauss-Jordan reduction and inverse of matrices, Row-reduced matrix, Linear dependence and independence of vectors, Rank of a matrix, Consistency and Solution of linear system of equations, Characteristic equation, Eigen-values, Eigen vectors, Properties of Eigen-values, Cayley-Hamilton theorem and its applications, Applications of linear algebra in architectural problem.	10L
UNIT-02	Differential Calculus: Function of two variables, Limit, Continuity and Differentiability, Partial Differentiation and its geometrical interpretation, Homogeneous functions, Euler's theorem and its extension, Total differentials, Composite function, Jacobian, Taylor's and Maclaurin's series (for one and two variables), Applications of differential calculus in architecture discipline.	10L
UNIT-03	Analytical Geometry: Introduction of Line, Equation of plane, Normal form, Transformation of the general equation of a plane to the normal form, Determination of a plane under given conditions, Systems of planes, Length of the perpendicular from a given point to a given plane. Definition and equation of the sphere, Equation of the sphere through four given points, Plane section of a sphere, Great circle.	10L
UNIT-04	Definitions of a cone, vertex, guiding curve, generators, Equation of the cone with a given vertex and guiding curve, Condition of general equation of the second degree representing a cone, Cylinder, enveloping cylinder, right circular cylinder, Applications of above topics in architecture.	06L
Course Outcomes		
Upon successful completion of the course, the student will be able to CO1: Understand and analyse the theoretical & practical aspects of matrices, calculus and analytical geometry. CO2: Solve systems of linear equations using multiple methods, demonstrate understanding of linear independence, and determine eigenvalues and eigenvectors and solve eigenvalue problems. CO3: Understand the various solution techniques and practical aspects of differential calculus. CO4: Familiar understanding with the basic concepts of analytical geometry and its applications. CO5: Apply the concepts of matrices, calculus and analytical geometry in various architectural problems.		
Books and References		
<ol style="list-style-type: none"> 1. E. Kreyszig, Advanced Engineering Mathematics, John Wiley and Sons, NC, New York. 2. R.K. Jain and S.R.K. Iyenger, Advanced Engineering Mathematics, Narosa Pub. House. 3. Shanti Narayan, P.K. Mittal, Analytical Solid Geometry, S. Chand & Company. 4. B.V. Ramana, Higher Engineering Mathematics, Mc Graw Hill, India. 5. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers. 		

Department of Architecture

Course Name: Architectural Design-II		
Course Code: AR-121		
Course Type: Professional Core (PC)		
Contact Hours/Week: 9D		Course Credits: 09
Course Objective		
To train the students in understanding the interdependence of form, function and structure in the process of Architectural design.		
Unit Number	Course Content	Lectures
UNIT-01	Concept of a load bearing structure.	20D
UNIT-02	Building Type: load bearing structure- Check Post, Post-Office, Design of small buildings Milk booths, Cafes, Canopy etc. (involving circulation, form, structure, and function)	44D
UNIT-03	Building Type: load bearing structure- Bank, Crèche, Dispensary, Architect's Office, Doctor's Clinic, Lawyer office & such similar projects of small scale (Cycle stand, E- Rickshaw stand, Taxi stand & Parking layouts, etc.)	44D
Note:	Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem in context to the above contents. Site visits, Case study and educational tour shall be organized.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the working and design process of a Single storied load bearing structure		
Books and References		
<ol style="list-style-type: none"> 1. Building drawing with an integrated approach to Built Environment by M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002. 2. Site Design Graphics by Michael S. Kendall, Van Nostrand Reinhold, 1989. 3. Architectural Graphics, 6th Ed. by Francis D. K. Ching, John Wiley & Sons, 2015. 4. Time-saver Standards for Architectural Design Data: The Reference of Architectural Fundamentals by Donald Watson, McGraw-Hill, 1997. 5. Time Saver Standards for Building Types by John Hancock Calendar, Joseph De Chiara, McGraw-Hill, New York, 1983. 6. Architectural Graphic Standards by Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons, New York, 2008. 		

Department of Architecture

Course Name: Building Construction & Materials – II		
Course Code: AR-122		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 4D		Course Credits: 04
Course Objective		
To familiarize the students with the use of timber in building construction.		
Unit Number	Course Content	Lectures
UNIT-01	Behavioral characteristics and applications of Timber: Variety of Indian timbers, characteristics, and suitability for different uses, defects, and decay, seasoning, and preservation; manufactured timber products and their applications as insulation materials and decorative materials. Ecological impact due to the use of wood, deforestation, etc. Study of engineered wood used in buildings, i.e., plywood, block boards, particleboards, and other types. Application of timber in building components with Joinery details. Terms defined; mitring, ploughing, grooving, rebating, veneering. Types of joints in woodwork: lengthening joints, bearing joints, halving, dovetailing, housing, notching, tusk, tenon, etc.	10D
UNIT-02	Building construction techniques in timber doors and windows. Detailed drawings and construction details of Battened-Ledged-Braced doors, Battened-Braced-Framed doors, Flush doors, etc. Introduction to various types of windows in Timber. Detailed drawings and construction details of Casement windows and Bay windows in Timber. Workshop practice for carpentry joints used in various timber constructions.	10D
UNIT-03	Building construction techniques in timber floors. Introduction to the nature and characteristics of wooden floors at the ground and first-floor level, its advantages & Limitations.	10D
UNIT-04	Building construction techniques in timber roofs. Introduction to the nature and characteristics of wooden roofs, its advantages, and Limitations. Characteristics of the roof, types of roofs (flat/ slopy roof), classification of roofs by the method of geometry and methods of construction – pitched, lean-to, coupled, couple-closed, collar, scissor, king post, and queen post) Detailed drawings and construction details of flat roof batten & tile and various sloping roofs in timber such as Lean to roofs, King Post truss, and Queen Post truss using AC/CGI, Mangalore tiles & slates roof coverings.	10D
UNIT-05	Introduction to staircases with respect to material and shapes. Definitions, Tread, riser, stringer, nosing, flight, landing, headroom, handrail, balusters, newel post etc. Types of staircases: straight, dog-legged, open-well, geometrical, circular, spiral, and bifurcated. Detailed drawings & Construction details of a wooden staircase.	08D
Note:	Site visits, case studies, and educational tours may be organized.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Introduction to Timber as a building material.		
CO2: Understand the process of timber joinery and learn to draw timber details.		
CO3: Understand the process of timber floor construction and learn to draw timber floors.		
CO4: Understand the process of timber roof construction and learn to draw timber roofs.		

Books and References

1. Building Construction Handbook by Roy Chudley and Roger Greeno, Routledge, New York, 2013
2. The Construction of Buildings, Vol. 1-2 by R Barry, Wiley, 2001.
3. Building Construction Metric Vol. 3 by W.B. Mckay, Orient Longman Private Limited, Mumbai, 2006.
4. Building Construction Illustrated by Francis D.K. Ching, John Wiley & Sons, 2011.
5. Construction Technology Vol. 1-4 by Roy Chudley and Roger Greeno, Prentice Hall (UK), 2005.
6. Workshop Practice 2ndEd. by H.S. Bawa, Tata McGraw-Hill Education, 2009.
7. Carpentry and Joinery by George Mitchell, Cengage Learning EMEA, 1995.
8. Arco's complete woodworking handbook by Jeannette T. Adams, Arco Pub., 1981.

Department of Architecture

Course Name: History of Architecture-II		
Course Code: AR-123		
Course Type: Professional Core (PC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To understand evolution and development of architectural and urban built environment in context to geophysical, social and technological factors.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to examples of early shelter, Stone Age as an expression of man's physical and spiritual needs. Introduction to Egyptian civilization. Study of local context and architectural characteristics of public buildings such as mastabas, pyramids and temples to be explained with examples.	09L
UNIT-02	Introduction to Mesopotamian civilization. Study of urban context and architecture of public buildings such as Ziggurat of Ur city and Khorsabad Palace.	09L
UNIT-03	Introduction to Greek civilization. Architectural characteristics of typical civic spaces such as Agora, Acropolis, theatres. Systems of proportioning, Greek orders, optical corrections etc. through illustrative examples such as Parthenon etc.	09L
UNIT-04	Study of Roman town with respect to location, Architectural characteristics of typical civic spaces such as Forum, theatres etc. Detailed studies of monuments/temples of Roman period with reference to materials, construction systems and Roman orders through illustrative examples.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Understand the architectural characteristics of Stone Age and Egyptian civilization.		
CO2: Understand the architectural characteristics of Mesopotamian and Greek civilization.		
CO3: Understand the architectural characteristics of Roman civilization.		
Books and References		
1. The World of Architecture by Paul Holberton, Chancellor Press, 1997.		
2. A History of Architecture by Sir Banister Fletcher, CBS Publisher, 1999.		
3. A History of Architecture by Spiro Kostof, Oxford University Press, 1995.		
4. Encyclopedia of World Architecture by Henri Stierlin, Facts on File, 1978.		
5. A Global History of Architecture, Mark M. Jarzombek, Vikramaditya Prakash and Francis D. K. Ching, John Wiley & Sons, 2011.		

Department of Architecture

Course Name: Architectural Drawing and Graphics-II		
Course Code: AR-124		
Course Type: Professional Core (PC)		
Contact Hours/Week: 6D		Course Credits: 04
Course Objective		
To enable the students to have a better visualization/understanding of a three-dimensional entity through Drawings: Sections-Metric views-Sciography and Sketching: Indoor-Outdoor.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction and Importance of Sections, Method of drawing Sections in which Section plane parallel to VP and perpendicular to HP / parallel to HP and perpendicular to VP / perpendicular to VP and inclined to HP / perpendicular to HP and inclined to VP / inclined to both HP and VP followed by illustrative examples in each case, True shape of section / Virtual sections / Auxiliary inclined view followed by illustrative examples.	16D
UNIT-02	Introduction to Lines of intersection / Curves of intersection, Method of drawing intersection of prisms /pyramids / cylinders followed by illustrative examples, making presentation drawings of these intersecting solids through Sciography.	08D
UNIT-03	Introduction and Importance of Surface development, Method of drawing surface development for Tetrahedron / Cube / Octahedron / Dodecahedron / Icosahedrons / Truncated Tetrahedron / Truncated Cube.	16D
UNIT-04	Introduction and Importance of Metric projections, Method of drawing Isometric projection / Axonometric projection / Elevation oblique projections followed by illustrative examples, Uses of these Metric Projections.	16D
UNIT-05	Introduction to Object drawing / Indoor sketching and its importance, Method of sketching simple objects / composition of objects freehand in proportion using pencils of different grades / water colors showing light / shade / shadow followed by situational exercises. Introduction to outdoor sketching through basic exercises like sketching of trees and shrubs, sketching of simple buildings with special emphasis on background and foreground and sketching of human figures using pencil of different grades/ water colors showing light / shade / shadow followed by situational exercises.	16D
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Learn to understand and draw sections of solids.		
CO2: Learn to understand and draw intersection of solids.		
CO3: Learn to understand and draw development of surfaces.		
CO4: Learn to understand and draw metric projections.		
CO5: Learn to understand and draw free hand sketching.		
Books and References		
1. A Textbook of Engineering Drawing by Prof. P.J. Shah, S. Chand Publishing, 2008.		
2. Engineering Drawing by Dhananjay A. Jolhe, Tata McGraw Hill, 2007.		
3. Architectural Shades and Shadows by Henry McGoodwin, Nabu Press, 2010.		
4. Rendering with Pen and Ink by Robert W. Gill, Thames & Hudson Ltd., 1984.		
5. Architectural Drawing by Tom Porter, Hamlyn, 1990.		
6. Sketching the Concept by Harold Linton and Scott Sutton, Design Press, 1993.		
7. Drawing the Landscape by Chip Sullivan, John Wiley & Sons; 4th Edition, 2014.		
8. Time-Saver Standards for Architectural Design: Technical Data for Professional Practice by Michael J. Crosbie and Donald Watson, McGraw-Hill, New York, 2005.		

Department of Architecture

Course Name: Architectural Workshop		
Course Code: AR-125		
Course Type: Skill Enhancement Course (SEC)		
Contact Hours/Week: 3P		Course Credits: 03
Course Objectives		
<ul style="list-style-type: none"> • To provide skills for carpentry joints. • To provide skills for Model Making. • To enable the students to make brick masonry using various bonds. • To enable the students to make Sculptures. 		
Unit Number	Course Content	Lectures
UNIT-01	Common tools used in carpentry shop.	-
UNIT-02	Carpentry machines, common accessories in carpentry.	-
UNIT-03	Details of carpentry joints.	-
UNIT-04	Materials used in model making.	-
UNIT-05	Site relief and modification.	-
UNIT-06	Method of finding surfaces and volumes of solids.	-
UNIT-07	Brick bonding theory - partition walls.	-
UNIT-08	Brick bonding theory - load bearing walls using English bond.	-
UNIT-09	Brick bonding theory - load bearing walls using Flemish bond.	-
UNIT-10	Building material- Plaster of Paris.	-
UNIT-11	Building material – Wire mesh.	-
UNIT-12	Building material - Thermocol/ clay/ any other material.	-
Practical No.	Contents of Practical	-
1.	Preparing a carpentry joint- Mortise & Tenon joint.	
2.	Preparing a carpentry joint- Dovetail joint.	
3.	Preparing a carpentry joint- Butt joint.	
4.	Practice of cutting various board such as sunboard, cardboard, plyboard etc. for use in model making.	
5.	Preparing a model of contoured site.	
6.	Surface development for making various solids.	
7.	Construct a Header (1 brick thick) & Stretcher bond (half brick thick) wall using conventional burnt bricks.	
8.	Construct an English bond wall of various thickness using conventional burnt bricks.	
9.	Construct a Flemish bond wall of various thickness using conventional burnt bricks.	
10.	Sculpture making using Plaster of Paris.	
11.	Sculpture making using Wire mesh.	
12.	Sculpture making using Thermocol/ clay/ any other material.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Learn to make carpentry joints.		
CO2: Learn to make architectural models.		
CO3: Understand use of bricks in various masonry bonds.		
CO4: Learn to make Sculptures.		
Books and References		
1. Introduction to Basic Manufacturing Processes and Workshop Technology by Rajender Singh, New Age International Pvt. Limited, Publishers, 2006.		
2. Barry's Introduction to Construction of Buildings by Stephen Emmitt and Christopher A. Gorse, Wiley-Blackwell, 2010.		
3. Time-Saver Standards for Architectural Design: Technical Data for Professional Practice by Michael J. Crosbie and Donald Watson, McGraw-Hill, New York, 2005.		
4. Building Materials by S.K.Duggal, New Age International Pvt. Limited, Publishers, 2012.		

Department of Humanities and Social Sciences

Course Name : Communication Skills		
Course Code : HS-104		
Course Type : Skill Enhancement Course (SEC)		
Contact Hours/Week: 2L+2P		Course Credits: 04
Course Objectives		
<ul style="list-style-type: none"> • To Introduce the basic skills crucial for successful English language communication. • To enable the students to communicate their perspectives in clear and correctly articulated language through LSRW skills. • To Provide ample opportunities to acquire, practice, and produce the language skills required in real-life academic and professional communication. • To develop skills of “correct” pronunciation of the English language • To Instill a lifelong habit of language learning among students to make them self-sufficient and independent learners. 		
Unit Number	Course Content	Contact Hours
UNIT-01	<p>Introduction: Role of Effective Communication Skills for an Architect, Challenges in Learning Language and Means to overcome them.</p> <p>Communication Process: What is communication? Process of Communication, Types of Communication (formal, semi-formal, and informal), Modes of Communication (verbal and non-verbal), Non-verbal Communication Types (Kinesics, Proxemics, Chronemics), Barriers to Effective Communication</p>	04L
UNIT-02	<p>Effective Listening Skills: What does listening mean? Listening versus Hearing, Listening Process (hearing, understanding, remembering, evaluating, and responding), Types of Listening (appreciative, empathetic, comprehensive, critical, and superficial), Note-taking, Barriers to Listening, Strategies for Effective Listening</p>	02L
UNIT-03	<p>Effective Speaking Skills:</p> <p>Public Speaking: Presenting a Variety of Speeches (informative, persuasive, demonstrative and special occasion), Extempore versus Impromptu Speech, Speech Preparation and Presentation Techniques, Poster presentations, Presenting architectural structures/ designs, etc.</p> <p>Interviews: Video conferencing (Google Meet, Zoom or Microsoft Teams) and Personal Interviews, Pre-interview Planning, preparing for GD in Current Topics, SWOT Analysis</p>	06L
UNIT-04	<p>Reading Skills:</p> <p>Referencing Skills: Use of traditional versus Digital Dictionaries, Note-making, Methods of Note-making (sentence, outline, mind-map, tabular/charting and Cornell)</p> <p>Comprehension Skills: Reading for Local and Global Understanding, Reading between the Lines, Summarizing the Ideas from the Reading Comprehension Passages, Reading for Evaluation, Vocabulary in Context</p> <p>Reading for literary appreciation: Reading fiction/poetry/plays and learning language through literature</p>	05L
UNIT-05	<p>Writing Skills:</p> <p>Paragraph Writing: Format (introduction, topic sentence, supporting details and conclusion), Genres of Writing (descriptive, narrative, expository and persuasive), Stages of Writing (brainstorming, drafting, revision, editing, proofreading and formatting)</p> <p>Letter and Email Writing: Formal versus Informal letters/emails, Letters Formats (full block, semi-block, modified block and modified semi-block), Request and permission letters and emails</p>	05L
UNIT-06	<p>Statement of Purpose (SoP): Importance of SoP, Format, and Guidelines for Writing SoP</p> <p>Cover letter and resume: Types of Resume (chronological and functional), Latest Professional Resume Templates</p> <p>Report Writing: Importance of technical report writing, types of technical reports, Language of report writing, collection of data for report writing, interpreting results (Charts and Figures), Outline of a technical report, writing abstracts/reports.</p>	04L

Practical No.	Content of the Practical	
1	Introduction to the Speech Sounds of English, Organs of the Speech	1P
2	Place and Manner of Articulation—Consonant sounds	2P
3	Vowel Sounds—Monophthongs and Diphthongs	2P
4	Syllabification	1P
5	Word stress, strong and weak forms	1P
6	Listening to everyday and workplace conversations	1P
7	Listening to Talks, documentaries, and BBC News	1P
8	Describing People, Places, Objects, etc.	1P
9	Just a Minute (JAM) Sessions	1P
10	Presentation using technology—PowerPoint Presentation (MS PPT), Google Slides, etc.	1P

Course Outcomes

Upon successful completion of the course, the students will be able to

CO1: Identify the importance of communication skills and develop their understanding of the basic concepts related to English language skills.

CO2: Understand and analyze critically what they listen/read and respond appropriately and constructively.

CO3: Apply principles of effective LSRW skills in professional and social communication.

CO4: Understand, analyze and evaluate the verbal and non-verbal messages effectively

CO5: Speak coherently with improved pronunciation skills

CO6: Acquire learning strategies to improve their communication skills after the course completion.

Textbooks

1. Technical Communication: Principles and Practice by Meenakshi Raman & Sangeeta Sharma. Oxford University Press: New Delhi.
2. English for Jobseekers: Language and soft skills for the aspiring by Lina Mukhopadhyay. Cambridge University Press: India.
3. Practical English Usage by Michael Swan. Oxford University Press: Oxford.
4. English Phonetics and Phonology: A Practical Course by Peter Roach. Cambridge University Press: Cambridge.
5. Ship or Sheep: An intermediate pronunciation course by Ann Baker. Cambridge University Press: Cambridge.

Reference Books

1. Strengthen your Communication Skills by Salivendra Jayaraju. Maruthu Publications: India.
2. The Definitive Book of Body Language by Allan Pease and Barbara Pease. Manjul Publishing House: New Delhi.
3. Language Through Literature: An Introduction. Paul Simpson. United Kingdom, Routledge.
4. Cambridge English Pronouncing Dictionary by Daniel Jones. Cambridge University Press: Cambridge.

Course Structure and Syllabi

For

Bachelors Programmes

(B.Arch.)

Second Year



राष्ट्रीय प्रौद्योगिकी संस्थान हमीरपुर

National Institute of Technology Hamirpur

Hamirpur- 177 005 (India)

<http://www.nith.ac.in>

July, 2023 Onwards

Second Year

3 rd Semester								4 th Semester							
SN	Code	Subject	L	T	P	D	Credits	SN	Code	Subject	L	T	P	D	Credits
1	AR-211	Architectural Design-III	0	0	0	9	9	1	AR-221	Architectural Design-IV	0	0	0	9	9
2	AR-212	Building Construction & Materials -III	0	0	0	4	4	2	AR-222	Building Construction & Materials -IV	0	0	0	4	4
3	AR-213	History of Architecture -III	3	1	0	0	4	3	AR-223	Building Services-I	3	1	0	0	4
4	AR-214	Architectural Drawing & Graphics -III	0	0	0	6	6	4	AR-224	Computer Applications in Architecture	0	0	4	0	4
5	AR-215	Climate and Built Environment	3	1	0	0	4	5	AR-225	Geomatics and Measure Drawing	3	1	0	0	4
6	CE-201	Analysis of Structures	3	1	0	0	4	6	CE-202	Design of RCC Structures	3	1	0	0	4
Total			Hours = 31				31	Total			Hours = 29				29

Department of Architecture

Course Name: Architectural Design-III		
Course Code: AR-211		
Course Type: Professional Core (PC)		
Contact Hours/Week: 9D		Course Credits: 09
Course Objective		
To train the students to understand the various issues which arise while designing a double-storied RCC building.		
Unit Number	Course Content	Lectures
UNIT-01	Design of a double-storied structure such as a Residence/Duplex House, Primary School etc.	49D
UNIT-02	Design of a Primary Health Center, or Restaurant, etc.	50D
UNIT-03	Time Problem of Cyber Café etc.	09D
Note:	Two design problems including a time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem in context to the above contents. Site visits, Case studies and educational tours shall be organized.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Compile and analyze the design of double-storey structures.		
CO2: Understand the space arrangement in small public buildings.		
CO3: Understand the conceptual process of design.		
Books and References		
1. Building drawing with an integrated approach to Built Environment by M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002.		
2. Site Design Graphics by Michael S. Kendall, Van Nostrand Reinhold, 1989.		
3. Architectural Graphics, 6th Ed. by Francis D. K. Ching, John Wiley & Sons, 2015.		
4. Time-saver Standards for Architectural Design Data: The Reference of Architectural Fundamentals by Donald Watson, McGraw-Hill, 1997.		
5. Time Saver Standards for Building Types by John Hancock Calendar, Joseph De Chiara, McGraw-Hill, New York, 1983.		
6. Architectural Graphic Standards by Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons, 2008.		

Department of Architecture

Course Name: Building Construction & Materials – III		
Course Code: AR-212		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 4D		Course Credits: 04
Course Objective To introduce construction details of various elements of the single-storied building having load-bearing masonry and foundations.		
Unit Number	Course Content	Lectures
UNIT-01	Foundation: Definitions, Purpose of foundation, types of foundation, selection criteria for a foundation based on soil conditions, physical properties and behaviour of various types of soil, bearing capacity, methods of site exploration and testing of soil, introduction to the shallow and deep foundation. Foundation types: stepped and stripped footing. Construction of foundations in brick and stone masonry for load-bearing and toe walls.	06D
UNIT-02	Surface Finishes: Smooth finishes, textured finishes, ribbed, hitched, exposed aggregate finish, weathering of finishes, roughcast, dry dash, stucco, gypsum, and pop applications, protective and decorative coatings, Defects in plastering, type of plastering, method of plastering. Varnishes, polish, and Paints-distempers, emulsions, cement base paints, oil base. Constituents of oil paints, characteristics of paints, types of paints, and process of painting on different surfaces. Types of varnish, methods of applying varnish, French polish, melamine finish, and lacquer finish their applications in building activities. Laminates and veneers, type of laminates, laminated wood, veneer from different types of timber, and their characteristics. Emphasis should also be given to details related to differently-abled people. Introduction to popular brand names.	08D
UNIT-03	Waterproof components: Water Proofing elements, causes and defects of dampness, methods adopted for waterproofing and damp proofing at different building levels, admixtures, and materials (rigid, flexible) used in the process. Construction chemicals and additives, adhesives, plaster of Paris, gypsum, Polystyrenes, sealants. Detailing of waterproofing of basement, toilets, terrace garden, French drains, etc. Building chemicals for damp proofing, termite proofing, concrete admixtures, etc. Details of application of Damp Proof Course and Water Proofing. Detailing of waterproofing of basement, toilets, terrace garden, etc. Expansion and construction joint.	08D
UNIT-04	Introduction to binders and plasters such as Cement and Lime, types of pointing. Detailed study of various cement concrete products.	10D
UNIT-05	Flooring and Finishes: Introduction to types of floors (ground, upper) and types of paving, essential requirements of a floor, factors affecting selection of flooring material, natural and artificial flooring materials like mud, brick, stone, tile, jack-arch floors, cement concrete, granolithic, wooden flooring, timber floor supported on rolled steel joists (RSJ), flag stone floor resting on RSJ, rubber, Vinyl, PVC, PVA etc., introduction to various floor finishes and fixing details. IPS flooring, mosaic flooring and cement tile flooring interlocking paving blocks. Timber floors, stairs and roofs, parquet flooring.	12D
UNIT-06	Introduction to Lintels, Arches, and Window sills; and their methods of construction. Introduction to jamb details and their application. Vaults and Domes: Principles and methods of construction, including techniques and details of formwork. Construction of Masonry Vaults and Domes – Concepts of Reinforced Concrete Domes and Vaults with formwork design. Set of drawings: Methods of construction of vaults and domes with details	06D
Note:	Site visits, case studies, and educational tours shall be organized.	

Course Outcomes

Upon successful completion of the course, the students will be able to

CO1: Understand various wall finishes of a load-bearing building.

CO2: Learn various foundation types of load-bearing structures and their construction methods.

CO3: Understand various building components and their construction methods.

CO4: Draw detailed drawings of load-bearing structures.

Books and References

1. The Construction of Buildings, Vol. 1-2-4 by R Barry, Wiley, 2001.
2. Building Construction Metric, Vol. 3 by W.B.Mckay, Orient Longman Private Limited, Mumbai, 2006.
3. Building Construction Illustrated by Francis D.K. Ching, John Wiley & Sons, 2011.
4. Construction Technology, Vol. 1-2-3 by RoyChudley, Roger Greeno, Prentice Hall (UK), 2005.
5. Architectural Graphic Standards by Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons, 2008.
6. Building Construction, 10th Ed. by B.C. Punmia, Ashok Kr. Jain, Arun Kr. Jain, Laxmi Publications Pvt Limited, 2008.

Department of Architecture

Course Name: History of Architecture– III		
Course Code: AR-213		
Course Type: Professional Core (PC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To understand the role of geophysical, societal, political and technological factors in the evolution of Architecture, and to develop a holistic approach to Architecture as an integral component of the built environment.		
Unit Number	Course Content	Lectures
UNIT-01	Study of the development of Church plans during the early Christian period w.r.t architectural character. Study of Byzantine churches w.r.t. architectural forms, structural systems, and techniques of construction eg -Hagia Sophia. Study of the evolution of Romanesque architecture w.r.t. changes in church plans, elevation features, techniques of construction and structural systems in Italy, France and Germany.	10L
UNIT-02	Detailed studies of Gothic Architecture, Cathedrals of Medieval European towns w.r.t. Architectural characteristics and their comparison to Romanesque period e.g.- Notre Dame. Comparison of Architectural characteristics of Gothic churches in France and England.	10L
UNIT-03	Introduction to the basis of the Renaissance Movement and its effect on the built environment. Study of the works of Architects of the Early Renaissance and High Renaissance.	08L
UNIT-04	Introduction to the basis of the Baroque and Rococo Movement and its effect on the built environment. Study of works of Architects - The baroque period such as Bernini and Borromini.	08L
NOTE	Analysis of architectural style/building typology must include functional, constructional /structural and ornamental aspects.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the Early Christian Architecture.		
CO2: Understand the origin and evolution of cathedrals and their comparison from different areas.		
CO3: Understand the basis of the Renaissance Movement and its effect on the built environment.		
CO4: Understand the basis of the Baroque or Rococo Movement and its effect on the built environment.		
Books and References		
1. The World of Architecture by Paul Holberton, Chancellor Press, 1997.		
2. Baroque India by Jose Pereira, Aryan Books International, New Delhi, 1990.		
3. Renaissance Architecture by Jose Pereira,		
4. A History of Architecture by Sir Banister Fletcher, CBS Publisher, 1999.		
5. A History of Architecture by Spiro Kostof, Oxford University Press, 1995.		
6. Encyclopedia of World Architecture by James Ferguson.		

Department of Architecture

Course Name: Architectural Drawing & Graphics – III		
Course Code: AR-214		
Course Type: Professional Core (PC)		
Contact Hours/Week: 6D		Course Credits: 06
Course Objective		
To enable the students to have a better visualization/understanding of a three-dimensional entity through Perspective Drawings		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Perspective drawings Introduction, Concept, Terminologies: Cone of Vision; Centre line of Vision; Horizon line; Distortion; Station Point; Visual rays; Picture plane; Ground line; Height line; and Vanishing Points, Types of Perspective projection: One Point Perspective; Two Point Perspective; Three Point Perspective; Box Method; and Centre line Method.	12D
UNIT-02	Setting up One Point Perspective Projection Detailed Method: Obtain the required dimensions through orthographic projection, Location of the Station Point and Centre line of Vision, Checking Station Point with the Cone of Vision, Location of the Picture Plane, Location of the Vanishing Point, Location of the Horizon line, Location of Ground line, Location of True Elevation on the Picture Plane, Location of Perspective lines through points on the True Elevation, Location of Visual rays to locate the various faces of the object in perspective view, and Illustrative practice examples.	08D
UNIT-03	Setting up Two Point Perspective Projection Detailed Method: Obtain the required dimensions through orthographic projection, Location of Station Point and Centre line of Vision, Alignment of the Centre line of Vision, Checking Station Point with Cone of Vision, Location of Picture Plane, Location of Vanishing Points, Location of Height line, Location of Horizon line and transferring Vanishing points on them, Location of Ground line, Location of the height of the object on Height line and top and bottom lines of sides in perspective view, Location of Visual rays to locate endpoints of a side of the object in perspective view, Using Visual rays and Perspective lines for plotting the perspective view of the object, and Illustrative practice examples	14D
UNIT-04	Setting up Three Point Perspective Projection Detailed Method: Obtain the required dimensions through orthographic projection, Location of Station Point and Centre line of Vision, Prepare elevation at right angles to Centre line of vision (plan position), Location Profile view of the plan position, Modify the plan position w.r.t Profile view, Location of the Picture plane in both Plan & Profile view, Location of Vanishing points in both Plan & Profile view, Locating the Horizon line & Ground line, Extending the Ground plane to meet the Ground line, Extending the plan of Centre line of Vision, Locate V.P.1, V.P.2 & V.P.3 in perspective view, Locate line at 45° from the intersection of Ground line & Ground plane for transferring points from the profile view to intersect the points from plan projections through Visual rays, Using Visual rays, Vertical & Horizontal projections and Perspective lines complete the perspective view of the object, and Illustrative practice examples.	14D
UNIT-05	Shadow projection in Perspective drawing Introduction, Location of Sun w.r.t. the spectator, Terminologies: Vanishing Point Plan; Vanishing Point Actual; Plan of light rays; Method of obtaining true inclination of the light ray with a ground plane. A detailed method of constructing shadows in Two-point Perspective projection: Location of Sightline, Plan location of Vanishing points, Locating Sight lines for obtaining the true angle of inclination of the light ray, Locating vanishing point for the actual light rays, Locating shadow of the object through the intersection of light rays joining the vanishing point for the plans of light rays to light rays joining the vanishing point for actual light rays, and Illustrative practice examples	14D
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the perspective drawing.		
CO2: Prepare a One Point perspective drawing.		
CO3: Prepare a Two Point perspective drawing.		
CO4: Prepare a Three-point perspective drawing.		
CO5: Prepare Shadow projection in perspective drawing.		
Books and References		
1. Rendering with Pen and Ink by Robert W. Gill, Thames & Hudson Ltd., 1984.		
2. Creative Perspective by Robert W. Gill, Thames & Hudson Ltd., 1975.		

Department of Architecture

Course Name: Climate and Built Environment		
Course Code: AR- 215		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To acquaint students with the concept of climate as a significant determinant of built form. Familiarization with climate controlling devices.		
Unit Number	Course Content	Lectures
UNIT-01	<p>Climatology: role of climate w.r.t. shelter and importance of building climatology, climatic zones, macro and micro-climate, global climatic factors, elements of climate: temperature, humidity, precipitation, solar radiation, wind, etc. Tropical climatic classification. Climatic zones of India and their characteristics.</p> <p>Human Comfort: human heat balance and thermal comfort, thermal stress index, effective temperature, and bioclimatic analysis, the interrelationship of climatic elements, and psychometric chart</p>	09L
UNIT-02	<p>Air Temperature: factors that influence air temperature - latitude, altitude, seasons, water, trees, areas, etc.; thermal conductivity and heat exchange between building and environment.</p> <p>Solar Radiation: calculation of solar radiation on building surfaces, solar charts; design and application of shading devices.</p> <p>Wind: Wind movement around and through buildings. Study of diurnal and seasonal variations, the effect of wind on design and siting of buildings.</p>	09L
UNIT-03	<p>Day-light: Sky as a source of light and day-light factor, Lighting- Windows, Room proportions and other building elements, daylight penetration.</p> <p>Passive design strategies: Site climate data, siting of buildings w.r.t. local factors- the presence of waterbody, aspect of the site, vegetation, wind, and view; climatic design of indigenous shelters in response to different climatic zones in India; Use of landscape elements, evaporative cooling, ground cooling, cavity walls.</p>	09L
UNIT-04	<p>Examples of contemporary climate-responsive building projects from India and abroad.</p> <p>Introduction to climatic design analysis and building simulation software.</p>	09L
Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1: Understand Climatology & Human comfort and its role in architecture.		
CO2: Understand the role of air temperature, solar radiation, wind & precipitation on building design.		
CO3: Apply the Climatic principles in their designs.		
Books and References		
<ol style="list-style-type: none"> 1. Climate and Architecture by Ellis Aronin Jefferey: Reinhold, 1953. 2. Manual of Tropical Housing and Building: Climate Design by O.H. Koenigsberger et.al, Madras: Orient Longman, 1984. 3. Man, Climate and Architecture by Givoni B., Van Nostrad Reinhold, 1981 4. Solar Control and Shading devices, by Olgyay Aladar, Olgyay Victor, Princeton University Press, 1957. 5. Microclimatic Landscape Design by Robert D. Brown and Terry J. Gillespie, John Wiley & Sons, 1995. 6. Energy-efficient Buildings in India by Mili Majumdar, TERI Press, 7. Sustainable Building-Design Manual- Volume I & II by TERI Press, 8. Thermal control in passive solar buildings by S.C. Kaushik, G.N. Tiwari and J.K. Nayak, IBT Publishers & Distributors, 1988. 		

Department of Civil Engineering

Course Name: Analysis of structures		
Course Code: CE-201		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To understand the principles of Structural Analysis, so that it forms the basis for Structural design.		
Unit Number	Course Content	Lectures
UNIT-01	Bending Moment in Beams, theory of simple bending, section modulus, design criterion, bending Moment in symmetrical and unsymmetrical sections, strength of sections. Shear stress In Beams and torsion, shear stress in beams and torsion in symmetrical and unsymmetrical sections	10L
UNIT-02	Fixed and Continuous Beams, review of shear force and Bending Moment diagram for simply supported beam, Effect of continuity, its advantages and disadvantages. Analysis of Continuous Beams for two to four spans, a conceptual idea about full and partial loading and fixed end moment using moment distribution method and Theorem of three moments.	10L
UNIT-03	Trusses, definition of Truss, Perfect Truss, Imperfect truss, types of Trusses and suitability, analysis of simple trusses by analytical method. Arches, types and behavior of arches with history. Introduction to three hinged arches. Frames, indeterminacy of frames with different end conditions, analysis of frame by portal & cantilever method.	10L
UNIT-04	Introduction of basic structural systems in architecture in 1D, 2D and 3D	06L
NOTE	The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks of sessional works may be divided accordingly	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the concept of Bending Moment and Shear stress in Beams.		
CO2: Understand the various forces on Fixed and continuous beams and calculate the loading by applying different methods.		
CO3: Understand the concept of Trusses.		
CO4: Understand the basic structural systems in architecture.		
Books and References		
1. Strength of Materials by B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, 2011.		
2. Theory of Structures SMTS - II: SI Units by B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, 2011.		
3. Elements of Strength of Materials by Stephen P. Timoshenko and Donovan H. Young, East West, 2003.		
4. Strength of Materials by Ramamrutham S., DhanpatRai Publications, 2011.		
5. Relevant Design Codes and Design Aids		

Department of Architecture

Course Name: Architectural Design – IV		
Course Code: AR-221		
Course Type: Professional Core (PC)		
Contact Hours/Week: 9D		Course Credits: 09
Course Objective		
To learn various aspects of design on hilly terrains.		
Unit Number	Course Content	Lectures
UNIT-01	Design of Tourist resort, Small Hotel/ Motel etc. Emphasis should be given to climatically and environmentally responsive architecture. The site may be chosen in different climatic conditions in India.	49D
UNIT-02	Study of Rural, Vernacular, and Historical Settlements/buildings of distinct Architectural characteristics including detailing with physical planning and other systems.	50D
UNIT-03	Time Problem of Guest house, Hostel/ Old age home etc. with due emphasis on contextual issues such as topography, local architectural character etc.	09D
NOTE	Two design problems and a one-time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problems in context to the above contents. Measure Drawing tour to be conducted during summer Vacations.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the topography and local architectural character of hilly terrain.		
CO2: Designing a climate-responsive building.		
CO3: Understand the Measure drawing techniques.		
Books and References		
<ol style="list-style-type: none"> 1. Building drawing with an integrated approach to Built Environment by M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002. 2. Planning and Design of Library buildings by Godfrey Thompson, Butterworth Architecture, 1995. 3. Shopping centers by Nadine Beddington, Butterworth Architecture, 1991 4. School Buildings: Planning-Design-Management by A.K.Jain, Management Publishing Company, 1998. 5. Buildings for the Performing Arts: Design and Development guide by Ian Appleton, Routledge, 2012. 6. Time-saver Standards for Architectural Design Data: The Reference of Architectural Fundamentals by Donald Watson, McGraw-Hill, 1997. 7. Time Saver Standards for Building Types by John Hancock Calendar, Joseph De Chiara, McGraw-Hill, New York, 1983. 		

Department of Architecture

Course Name: Building Construction & Materials – IV		
Course Code: AR-222		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 4D		Course Credits: 04
Course Objective		
To familiarize the students with methods of detailing different parts of a building in RCC.		
UnitNumber	Course Content	Lectures
UNIT-01	Cement concrete: Definition, properties, specification, water cement ratio, preparation, placing, curing, casting and different equipment used, fine and coarse aggregates, types of concrete (aerated, polymer, ready mix, fibre reinforced), and grades of concrete, P.C.C, and R.C.C.	12D
UNIT-02	Type of RCC foundations in framed structure – stepped, isolated, combined, and cantilevered footing, raft, and pile foundation; selection of foundation type as per soil bearing capacity and its improvements; depth and width of foundations; causes and failure and remedies of foundation. Different types of RCC roofs such as flat (one-way, two-way & continuous), conical & circular slabs, filler slabs, waffle slabs, coffer slabs, flat slabs, and folded plates. Principles and methods of construction including formwork techniques and reinforcement details. Introduction to various types of RCC staircases. Detailed drawings and construction details are to be made for any RCC Stairs. Typical cross-section of a RCC Structure. Introduction to formwork. Excavation and timbering of trenches with special references to loose soil and sub-soil water. Detailed studies of various types of formwork for concrete, Scaffolding, temporary supports, and Shoring & Underpinning.	10D
UNIT-03	Introduction to cladding materials of interior and exterior walls in various materials such as brick tiles, stones, vitreous tiles, panelling, etc. Detailed drawings of their fixing details. Metal cladding of facade and building envelope Curtain walling, structural glazing, and cladding, pint supported glazing, ACP aluminium louvers, and advanced method of construction like Kinetics facade, etc. Introduction to various materials like P.V.C., fibre-based products, etc. Detailed studies such as properties and application of the same in the building industry.	12D
UNIT-04	Prestressed Concrete Structures: Introduction, method of prestressing, losses of prestressing, designing of rectangular beams. Introduction of Prefabrication- Advantages and disadvantages of on-site and off-site prefabrication; Prefabrication in the Indian construction industry. Emerging trends in building construction and materials.	08D
UNIT-05	Introduction to glass as building material; its types, manufacturing process, and applications. Introduction to Plastics as a building material: Types, properties, and uses of plastics such as polycarbonates, acrylics, PVC polymer films, and fibre-reinforced plastic. Application and details.	06D
Note:	Site visits, case studies, and educational tours shall be organized.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand various wall finishes of a load-bearing building.		
CO2: Learn various foundation types of load-bearing structures and their construction methods.		
CO3: Understand various building components and their construction methods.		
CO4: Draw a detailed drawing of load-bearing structures.		

Books and References

1. Construction Technology, Vol. 1 by Roy Chudley, Roger Greeno, Prentice Hall (UK), 2005.
2. The Construction of Buildings, Vol. 2 by R Barry, Wiley, 2001.
3. Handbook of Architectural details for Commercial buildings by Joseph De Chiara, McGraw-Hill, 1979.
4. Time Saver Standards for Building Materials and systems by Donald Watson, McGraw-Hill, 2000.
5. Time Saver Standards for Interior Design and Space Planning by Joseph DeChiara, Julius Panero, Martin Zelnik, McGraw Hill Professional, 2001.
6. Building Design and Construction Handbook by Merrit, Ricketts, McGraw-Hill Prof Med/Tech,2000.

Department of Architecture

Course Name: Building Services – I		
Course Code: AR- 223		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To familiarize the students with the fundamentals of water supply and drainage in building services & their integration with architectural design.		
Unit Number	Course Content	Lectures
UNIT-01	Water Supply: - Detailed studies such as sources and treatment of water Water demand & calculations, storage & conveyance of water at the municipal level Water supply systems and various fittings, Water Balance Hot and cold-water supply layouts Water supply design of a residence: connection with water mains, design of underground & overhead water tanks, pump capacity, calculations for the diameter of the pipe Water supply layout and Head loss calculations for the distribution network of a residential building Introduction to water supply in a multistoried building etc.	16L
UNIT-02	Wastewater: - Definition of subsoil water, stormwater, night soil, sewage sanitary, domestic & industrial, sewer, sewerage & wastewater. Various drainage & sanitary fixtures & fittings, traps, the role of water seal, sizes, materials and their space requirements, water efficient and waterless fixtures Types of pipes and drains in different materials and their usage, the diameter of pipes, slope standards inspection and intercepting chambers, manholes etc. Zero discharge concepts; Sewage and effluent treatment, innovative and cost-effective sanitation concepts e.g., EcoSAN Sewage systems for a small project, wastewater recycling methods e.g., DEWATS etc. Introduction to STPs & ETPs, design calculations of septic tank & soak pit Stormwater design calculations for rooftop & for surface drains, Rainwater Harvesting & Groundwater Recharge etc. Exercise: Design a layout for a residence for water supply, drainage, sewage and stormwater	16L
UNIT-03	Solid Waste Management- Definition of refuse, garbage, rubbish, sullage etc. Waste production in India and at a global scale, Waste management techniques etc.	04L
NOTE	The time mentioned at the end of each of the above units indicates the tentative time taken to complete each unit. The marks for sessional work may be divided accordingly.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the fundamentals of water supply to a building.		
CO2: Understand the collection & treatment of wastewater.		
CO3: Understand solid waste management and learn its management techniques.		
Books and References		
1. Water Supply Engineering by Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, 2003.		
2. Design & Practical Handbook on Plumbing by Cr Mohan and Vivekanand, Standard Publishers Distributors, 2014.		
3. Wastewater Engineering by Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, 1998.		
4. Environmental Education and Solid Waste Management by A. Nag and K. Vizayakumar, New Age International, 2005.		
5. Water and Wastewater Calculations Manual by Shun Dar Lin and C. C. Lee, McGraw-Hill Professional; 2nd edition, 2007.		
6. Advances in Water Supply Management: Proceedings of the CCWI '03 Conference, London, 15-17 September 2003, by CedoMaksimovic, David Butler and Fayaz Ali Memon, 2003.		

Department of Architecture

Course Name: Computer Applications in Architecture	
Course Code: AR- 224	
Course Type: Skill Enhancement Course (SEC)	
Contact Hours/Week: 4P	Course Credits: 03
Course Objectives	
At the end of this course, the students should be able to create three-dimensional objects in space, which can also be used for the purpose of presentation as well as visualization using different rendering techniques.	
Unit Number	Course Content
UNIT-01	Creating a document file, viewing editing and formatting a document, using graphics in a text document, etc., Report writing, Computation of data & Presentations through relevant Software.
UNIT-02	Introduction to 2D tools of CAD Creating Drawings & Using text. Use of Drawing and modify toolbar. Grouping of Objects.
UNIT-03	Introduction to Building Information Modeling (BIM). Introduction to other Modeling Software. Introduction to Image Processing Software.
UNIT-04	3D Rendering: -Introduction to 3D Rendering, Simulating the Sunlight angle, Adding shadows, Adding Materials and adjusting its appearance, Adding a background scene, Effects with light, Adding Reflections and details with Ray Tracing, Creating and adjusting Texture maps, Adding Landscape and people and Improving your images and editing.
NOTE	The time mentioned at the end of each of the above units indicates the tentative time taken to complete each unit. The marks for sessional work may be divided accordingly.
Course Outcomes	
Upon successful completion of the course, the students will be able to	
CO1: Improve their report writing & presentation skills.	
CO2: Design and compose architectural drawings in CAD.	
CO3: Create 3D objects in space.	
CO4: Visualize the colour, texture and material of different objects.	
Books and References	
1. Mastering Microsoft Office-2007, CADD Centre, India.	
2. Mastering AutoCAD 2010 and AutoCAD LT 2010 by George Omura, Wiley, 2009.	
3. Mastering Adobe Photoshop.	

Department of Architecture

Course Name: Geomatics and Measure Drawing		
Course Code: AR-225		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective To bring about awareness about the role of Geomatics in architectural and planning projects.		
Unit Number	Course Content	Lectures
UNIT-01	Importance of Geomatics, data collection techniques- field surveying. Definition of surveying, basic principles, types of maps, their scales, and uses, surveying equipment, namely Levels, Compass, Theodolite, Total Station, and Laser-based equipment.	08L
UNIT-02	Measurements of distance, angles, directions, and heights: principles and components of Theodolite, Magnetic Compass, IOP Levels, Auto Levels, Total Station. Contouring: technical terms used in contouring, characteristics of contours, methods of contouring, tracing the contour, gradient for alignment of roads and paths, uses of contours.	08L
UNIT-03	Levelling: Concept and Terminology, Levelling Instruments and their Temporary and permanent adjustments method of levelling.	06L
UNIT-04	Plane table surveying: Plane table and its accessories, setting and orienting the plane table, methods of plane tabling, advantages and disadvantages of Plane table survey.	06L
UNIT-05	Survey drawing of any settlement.	08L
Course Outcomes Upon successful completion of the course, the students will be able to CO1: Understand the Surveying techniques. CO2: Understand the various equipment and methods for surveying. CO3: Understand the method of plane table survey. CO4: Learn the practical application of Geomatics.		
Books and References 1. Surveying- Vol.1 by Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi; Sixteenth edition, 2005. 2. Textbook of Surveying by C. Venkatramaiah, Orient Blackswan; Second edition, 2011. 3. A Textbook of Advanced Surveying by R. Agor, Khanna Publishers, 2002. 4. Surveying and Levelling by S. C. Rangwala and P. S. Rangwala, Charotar Book Stall, 6th edition, 2011. 5. Advanced Surveying by P. B. Shahani, 2nd edition; Oxford & IBH Publishers Co., 1992.		

Department of Civil Engineering

Course Name: Design of RCC Structures		
Course Code: CE- 202		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To understand the basic properties of RCC as a building material and principles of design of RCC structures.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction:- materials, basic properties of concrete and steel, reinforcement, standard loading, characteristics strength, permissible stresses in concrete and steel as per Indian Standard, design philosophies- working method, Ultimate Load Method and Limit state Method.	06L
UNIT-02	Limit State Design Method: safety and serviceability requirements, limit states, characteristics material strength and loads and Partial safety factors. Design of Beams: design of singly and doubly reinforced beams including L & T beams for flexure shear, bond and torsion. Design of Compression members: design of short and slender columns using SP 16. Design of RCC one way & two way slab.	12L
UNIT-03	Proportioning of footings: - Square, Rectangular, Circular, Trapezoidal and combined.	12L
UNIT-04	Introduction to pre-stressed concrete.	06L
NOTE	The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks of sessional works may be divided accordingly.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the basic properties of concrete & steel as per Indian Standards.		
CO2: Learn the design of beams, columns and slabs.		
CO3: Understand the proportioning of footings.		
CO4: Understand the concepts of pre-stressed concrete.		
Books and References		
1. R.C.C. Designs (Reinforced Concrete Structures) by Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi; Tenth edition, 2006.		
2. Reinforced Concrete, 6th Edition by S.K.Mallick and A.P.Gupta, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi, 1996.		
3. Limit State Design of Concrete Structures by Dr.Ramchandra and VirendraGehlot, Scientific Publishers, 2007.		
4. Comprehensive RCC Design by Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi; Tenth edition, 2006.		

Course Structure and Syllabi

For

Bachelors Programmes

(B.Arch.)

Third Year



राष्ट्रीय प्रौद्योगिकी संस्थान हमीरपुर

National Institute of Technology Hamirpur

Hamirpur- 177 005 (India)

<http://www.nith.ac.in>

July, 2023 Onwards

Third Year

5 th Semester									6 th Semester								
SN	Code	Subject	L	T	P	D	Credits	SN	Code	Subject	L	T	P	D	Credits		
1	AR-311	Architectural Design-V	0	0	0	9	9	1	AR-321	Architectural Design-VI	0	0	0	9	9		
2	AR-312	Building Construction & Materials -V	0	0	0	4	4	2	AR-322	Building Estimation, Costing & Specification	3	1	0	0	4		
3	AR-313	Building Services-II	3	1	0	0	4	3	AR-323	Hill Architecture	3	1	0	0	4		
4	DET	Professional Elective- I	3	1	0	0	4	4	AR-324	Site Planning	3	1	0	0	4		
5	DET	Professional Elective- II	3	1	0	0	4	5	DET	Professional Elective- III	3	1	0	0	4		
6	OET	Open Elective -I	3	0	0	0	3	6	DET	Professional Elective- IV	3	1	0	0	4		
Total			Hours =				28	28	Total			Hours =				29	29

Department of Architecture

Course Name: Architectural Design-V		
Course Code: AR-311		
Course Type: Professional Core (PC)		
Contact Hours/Week: 9D		Course Credits: 09
Course Objective		
To understand the traditional construction techniques and to study the design considerations under the broad heading of Barrier Free Environment.		
Unit Number	Course Content	Lectures
UNIT-01	Completion of the measured drawing of the building studied in the summer vacations.	49D
UNIT-02	Design of a small campus such as Apartment Building, Row Housing, Commercial, Residential school, etc. with emphasis on design with Barrier Free Environment.	50D
UNIT-03	Time Problem of District Library, Museum etc.	09D
Note:	Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem in context to the above contents. Site visits, Case study and educational tour shall be organized.	
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Learning of various traditional construction techniques.		
CO2: Learning various barrier free design methodologies.		
CO3: Learning design methodologies of medium scale public buildings.		
Books and References		
<ol style="list-style-type: none"> 1. Building drawing with an integrated approach to Built Environment by M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002. 2. Manual of Tropical Housing & Building by O. H Koenigsberger, T. G Ingersoll, Alan Mayhew, S V Szolay, Universities press, 2000. 3. Campus Architecture: Building in the Groves of Academe by Richard P. Dober, 1996. 4. Campus & Community, Moore RubleYudell Architecture and Planning by Rockport Publishers, Inc., 1997. 5. Environmental Design An introduction for architects and engineers by Randall Thomas, Taylor and Francis, 2005. 		

Department of Architecture

Course Name: Building Construction and Materials-V		
Course Code: AR-312		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 4D		Course Credits: 04
Course Objective		
To understand the constructional aspects of structural steel and its application as various building components.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to structural steel sections, grillage foundation, and framed construction. Detail studies such as characteristics of structural steel sections, methods of jointing and its applications of structural members in different parts of the building. Introduction to the concept of the Mezzanine floor.	06D
UNIT-02	Types of industrialized doors and windows: casement windows, sliding, revolving, collapsible, rolling shutters, steel sections, etc. Detailed drawings and construction details of various types of doors and windows in steel. Detailed drawings and construction details of Steel stairs such as Straight flight and Spiral. Detailing of structural glazing, curtain walls, triple glazing windows, aluminum composite panels, etc. Details of aluminum doors and windows and roof gardens.	08D
UNIT-03	Introduction to Structural steel trusses and Pre-engineered buildings. Detailed drawings and construction details of North light truss, tubular truss, lattice girder along with roof coverings, valleys, gutters etc.	10D
UNIT-04	Introduction to various materials, products and hardware for false ceiling, paneling and partitions. Detailed drawings and construction details of false ceilings. Introduction, requirement of partition, types of partitions (viz. Brick, clay, concrete, glass, timber, gypsum etc.) Various types of paneling (glazed, wooden etc.), details for paneling, sound proof and lightweight partitions. Set of drawings: Types of partitions, paneling and false ceiling (joinery and fixing details). Partitions, paneling and false ceiling in timber and other materials; such as gypsum board, different kind of timber derivatives.	08D
UNIT-05	Introduction to methodology of preparing working drawings, Systems of dimensioning, writing specifications, etc. Preparation of various working drawings civil work and services of a building. Preparation of working drawings of toilets, modular kitchen, built- in furniture, Shop fronts, display units, counter (shops, Bank, hotel etc.) and other furniture items.	10D
UNIT-06	Introduction to advanced structural forms like shell structures, Pneumatic Structure, geodesic domes, space frames, tensile structures. Detailing of a space frame; Principles and methods of construction with explorations using physical models.	06D
Note:	Site visits, case studies, and educational tours shall be organized.	
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Identify the various steel sections associated with different structural components.		
CO2: Understand the details of industrialized doors and windows in steel.		
CO3: Draft the various construction details of steel trusses.		
CO4: Understand the details of false ceiling.		

Books and References

1. The Construction of Buildings, Vol. 3 4/e PB by R Barry, Wiley, 2001.
2. Building Construction Metric, Vol. 4 by W.B.Mckay, Orient Longman Private Limited, Mumbai, 2006.
3. Building Construction Illustrated by Francis D.K. Ching, John Wiley & Sons, 2011.
4. Construction Technology, Vol. 2-3-4 by Roy Chudley, Roger Greeno, Prentice Hall (UK), 2005.
5. Architectural Graphic Standards by Charles George Ramsey, Harold Reeve Sleeper, Bruce BasslerJohn Wiley & Sons, 2008.
6. Interior Design by Ahmed A Kasu, Om Books, 2005.
7. Time Saver Standards for Interior Design and Space Planning by Joseph De Chiara, Julius Panero& Martin Zelnik, Mcgraw- Hill, 1991.

Department of Architecture

Course Name: Building Services-II		
Course Code: AR-313		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L+1T		Course Credits: 04
Course Objective		
To familiarize the students with fundamentals of electricity, illumination and acoustics in building services & their integration with architectural design		
Unit Number	Course Content	Lectures
UNIT-01	Electrical energy and its generation. Electrical distribution systems and safety devices. Types of wiring systems, advantages and disadvantages, safety and precautions, Internal wiring, loads, demand, tariffs and rules Types of electrical equipment's used in a building such as bus bar, switches, wall plugs, lamp holders, ceiling rose and relays etc.	08L
UNIT-02	Detailed studies of the electrical Fittings such as MCB, MCCB, ACB, VCB, RCD, ELCB, RCBO and wired fuse units; Difference between fuse and circuit breaker; current ratings and size of boards etc. Introduction to Indian Electricity rules related to buildings Provisions of National Building Code 2016 related to Electrical Installations in buildings- Distribution of supply and cabling; Wiring; Fittings and accessories; Earthing; Lightning protection of buildings; Drawing symbols for electrical installations in buildings as per National Building Code 2016 Exercise: 1. A visit to a substation and within any building 2. Preparing an electrical layout with all necessary details for a small building/residence	08L
UNIT-03	Introduction to Illumination, studies of the same such as various types of artificial lighting. Various Terms in lighting, Principles of Lighting, Recommended Values of illuminance etc. Types of artificial lighting sources, types of luminaries & fixtures etc. Comparative efficiency of lighting fixtures. Methods and calculation for lighting design- Inverse Square Law, Cosine Law & Coefficient of Utilization Method etc.	10L
UNIT-04	Planning and Design against Outdoor Noise; Planning and Design against Indoor Noise. Introduction to general principles of sound such as Reverberation, Absorption, Reflection, etc. Introduction to Building acoustics with reference to various building types such as Residential, Educational, Hospitals, Office buildings etc. and specific indoor spaces such as studios, auditoriums etc. Detailed studies of various types of Acoustical materials and their application etc.	10L
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Learn to plan and draft the electrical layout of a building.		
CO2: Identify the need of lighting for various spaces.		
CO3: Understand the fundamental principles of sounds and its distribution, various acoustic material used in a building.		
Books and References		
<ol style="list-style-type: none"> 1. IS 732: 1989 - Code of Practice for Electrical Wiring Installations. 2. National Building Code 2016, Bureau of Indian Standards 3. Electrical Design & Drawing: with estimation and costing by Surjit Singh, Dhanpat Rai & Co (p) Ltd., 2007. 4. Lighting Design Handbook by Lee Watson, McGraw-Hill Inc.,USA, 1990. 5. Architectural Lighting Design by Gary R. Steffy, Van Nostrand Reinhold, 1990. 6. Fundamentals of Acoustics by Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens and James V. Sanders, John Wiley & Sons; 4th Edition, 2000. 7. Acoustics in the Built Environment: Advice for the Design Team by Peter Mapp, Peter Sacre, David Saunders and Duncan Templeton, Architectural Press, 1993. 		

Department of Architecture

Course Name: Sustainable Vernacular Practices in Himachal Pradesh (Professional Elective-I)		
Course Code: AR-331		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
This course covers topics on the traditional architecture of various parts of the country. The objective of the course is to make students aware of the planning aspects, materials used in construction, constructional details, and settlement planning in various parts of the country.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Vernacular Architecture Approaches and concepts to the study of Vernacular architecture – A study of major typologies in various parts of the world.	06L
UNIT-02	Hill architecture and its unique attributes and concerns. Major hill settlements in various districts of Himachal Pradesh. A broad view of sustainable vernacular hill architecture.	06L
UNIT-03	Building Types, techniques and materials of vernacular architecture of Himachal Pradesh. Study of vernacular construction techniques of Himachal Pradesh; Koti Banal Architecture (Kath-Kuni), Thathara houses, Dhajji construction etc. Resilience of Vernacular construction techniques.	09L
UNIT-04	Vernacular & Contemporary Construction techniques as adopted in the Zone-4 & 5, of earthquake region of the Himachal Pradesh state. Study of Vernacular/Village settlement of hilly region preferably Himachal Pradesh. Appropriate Materials – Study of Appropriate Materials based on Vernacular construction techniques from different parts of the country. A study of BMTPC technologies, Auroville Earth Institute.	15L
Note:	Studies are to be taken in groups in any of the different regions indicated above. Field visits, documentation to be taken up and a report to be prepared based on literature review and field visit. Reports should include factors influencing planning aspects, religious practices and beliefs, culture & climatic factors, materials of construction, and constructional details. Field visits may be planned in the preceding vacation periods/clusters of holidays so as not to disturb class work.	
Course Outcomes		
Upon successful completion of the course, the student will be able to:		
CO1: Understand the Vernacular practices in different regions of the country.		
CO2: Learn construction material, techniques, and planning aspects in various vernacular practices.		
CO3: Understand the requirements and precautions to be adopted as per seismic activity.		
CO4: Learn modern practices and technologies prevalent in appropriate materials for vernacular construction		
Books and References		
1. Traditional buildings of India, Ilay Cooper, Thames and Hudson Ltd., London.		
2. The Tradition of Indian architecture – Continuity & Controversy – Change since 1850, G.H.R.Tillotsum Oxford University Press, Delhi.		
3. VISTARA – The architecture of India, Carmen Kagal. Pub: The Festival of India, 1986.		
4. Encyclopaedia of Vernacular architecture of the World, Cambridge University Press.		
5. Prathaa: Kath-khuni Architecture of Himachal Pradesh, Jay Thakkar, 1st Edition, Publisher: SID Research Cell, CEPT University		

Department of Architecture

Course Name: Environmental Studies (Professional Elective- I)		
Course Code: AR-332		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective To make the student aware of the environment, its quality, pollution, legislation and approach for it.		
Unit Number	Course Content	Lectures
UNIT-01	Our Earth's Environment, Fundamentals of ecosystem—its structure, function, flow of energies and matters in environment, Human Impact on Environment.	09L
UNIT-02	Environmental Quality and Indicators, Environmental degradation, Pollution types, effects and Control techniques; Environmental impact assessments.	09L
UNIT-03	Environmental legislation, Sustainable development goals, Environmental Planning and Design Guidelines.	09L
UNIT-04	Social Issues and the Environment - Urban problems, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people, Environmental ethics, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies. Wasteland reclamation, Consumerism and waste products, Environmental Protection Act	09L
Course Outcomes Upon successful completion of the course, the students will be able to: CO1: Understand the ecosystem, how it functions and how humans impact it CO2: Understand the environmental indicators, types of pollution and how to control them CO3: Understand laws and guidelines related to environment and the sustainable development goals		
Books and References <ol style="list-style-type: none"> 1. Environmental Pollution and Control by J. Jeffrey Peirce, P Aarne Vesilind, Ruth Weiner, 1997 2. Ecology Environmental Science And Conservation, by SP Singh and JS Singh, 2017 3. Sustainable Development Goals: A Handbook by By UNDP, 2016 4. Environmental Pollution Principles Analysis and Control Paperback by Narayanan P, 2018 5. Handbook of Environmental Laws, Acts, Guidelines, Compliances & Standards, by Dr. R. K. Trivedy, 2009 		

Department of Architecture

Course Name: Art and Architecture (Professional Elective- I)		
Course Code: AR-333		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
This course covers topics on in the development of human settlements in relation to infrastructure. The objective of the course is to make students aware about infrastructure as important part in analyzing planning problems.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to application of art in Architecture, Purpose of Applied Art, Principles and nature. Paintings, Murals and Sculptures; Materials and techniques study of styles and changing trends in India from ancient times.	09L
UNIT-02	Decorative elements such as Jali Design; Inlay work; Relief art work; Study of changing needs in different periods- Dravidian, Gandhara, Gupta, Mughal, Rajput; Materials and techniques. Application of colors and textures in sculptures, murals, paintings, fountains etc., psychological effects of colors and textures.	09L
UNIT-03	Art expression, appreciation and symbolism; two and three-dimensional forms; Aesthetic order; functional Importance. Interior and exterior space organization, graphic techniques of communication, form-space relation.	09L
UNIT-04	Modern trends in applied art, contribution of science and technology in terms of new materials. Styles and techniques of modern masters.	09L
Course Outcomes		
Upon successful completion of the course, the student will be able to:		
CO1: Develop an artistic understanding.		
CO2: Learn compositions, color combinations and geometric patterns.		
CO3: Learn the style and techniques around the world.		
Books and References		
1. Architecture/ Art/ Parallels/ Connections- Barry A. Berkus AIA, the Image Publication Group Pvt. Ltd.		
2. Design Fundamentals by Scott R.G.; McGraw Hill, 1951		
3. Prebles' Artforms: An Introduction to the Visual Arts by Patrick Frank, Duane Preble, Sarah Preble; Pearson College Division, 2013		
4. Architecture: Form, Space, and Order by Francis D. K. Ching; John Wiley & Sons, 2014		

Department of Architecture

Course Name: Barrier Free Architecture (Professional Elective- II)		
Course Code: AR-351		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
This course covers topics on various provisions and design issues for barrier-free architecture. The objective of the course is to sensitize the students towards the need for making the built environment accessible to elderly and differently-abled persons.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Provisions of persons with Disabilities (Equal opportunities, Protection of Rights and Full Participation) Act, 1995, Type of disabilities - Orthopedic, Hearing, Visual Impairments, National Policy for provisions for elderly persons, Concept of equal opportunity, human rights, social justice and empowerment of physically challenged persons. Introduction to similar efforts in other countries. Initiatives at global and international level for protection of rights of disabled and also elderly person. American disabilities Act 1990 etc. Information on various types of national Institutes, agencies and professional bodies involved in disabled welfare, associated norms and standards thereof. The role of NGO's, professionals and outreach.	10L
UNIT-02	Principles of Universal Design; Design principles in architecture for creating environments friendly for various types of physically challenged persons. Barrier-free concept for educational Institutions, hospitals, transportation terminals such as bus, railway stations and airports. Study of standards as given in TSS, TCPO, CPWD, ADA etc., and others.	12L
UNIT-03	Provisions in public spaces and site planning– Parks, Playgrounds, Public transportation, Parking lots, Details of sidewalks, road intersections, access to public toilets.	06L
UNIT-04	Provisions in design of public buildings - Details in, ramps, guide rails, lifts, dimensions of wheelchairs, accessibility in public buildings, Signage, audio-visual facilities, etc. Design of Toilets and interiors spaces for use of physically challenged.	08L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the need for a barrier-free environment.		
CO2: Learn about various types of disabilities and develop design solutions.		
CO3: Learn about codes and standards for barrier-free built environment.		
Books and References		
1. Micheal J. Bednar. "Barrier Free Environments", Dowden, Hutchinson and Ross, Ives 1977.		
2. Ministry of Urban Affairs and Employment. Central Public Works Department, India, "Guidelines and Space Standards for Barrier Free Environment for Disabled and Elderly Person, 1998.		
3. Unnati. "Design Manual for a Barrier – Free Built Environment", Handicap International, December, 2004		

Department of Architecture

Course Name: Society and Built Environment (Professional Elective-II)		
Course Code: AR-352		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To impart knowledge about the social stratification and its influence on the built environment.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction: Defining sociology, evolution of sociology, paths of 6 sociology: historical, empirical & analytical, sociological methods, concepts: culture, socialization, social control, power, authority.	06L
UNIT-02	Social Stratification and Change: perspectives on social stratification; caste system; jajmani system; sankritisation; westernisation, secularization and modernization Globalization and the Changing World: Determinants and Effects of globalization; nation-state, nationality and globalization.	06L
UNIT-03	Culture, Art, Architecture and Built Environment: Contribution of culture and art in architecture and built environment; Case studies of different socio-cultural contexts Understanding underlying meanings: Perceptual and Associational Aspects of Environment, Knowledge of meanings, nature of "Environment", organization of meaning, relationship between meaning and communication in built form.	12L
UNIT-04	Architecture and its Influences: Understanding of the context and its impact on Settlement patterns and Built forms, role of resources and climate, spatial organization, Aesthetics and Functionality, Present Scenario, Factors influencing change in built form. Cities and Urban Spaces: Urbanism and the built environment, Theorizing urbanism – Chicago school. Ferdinand Tonnies, Emile Durkheim; Cities in traditional societies, industrialization and urbanization, development of modern city, urbanization in the developing world.	12L
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Have an understanding of the sociological perspectives on society and built environment.		
CO2: Understand the cultural and social context that have influenced architectural design and construction.		
CO3: Ability to analyze and critique the built environment and their impact on society.		
Books and References		
<ol style="list-style-type: none"> 1. Ahuja, R., "Indian Social System", Rawat Publications, Jaipur. 2009 2. Giddens, Anthony, Sociology, Polity Press, Cambridge, 5th edition 2006 3. Harlambois, M. and Heald, R.M., "Sociology-Themes and 2008 Perspective", Oxford University Press, New Delhi. Julier, G., "The Culture of Design", Sage, London 2013 4. Rapoport, A., "House, Form and Culture", Prentice Hall 1969, Englewood Cliffs NJ 5. Rapoport, A., "Culture, Architecture and Design", Locke Science 2005 Publishing, Chicago. 6. Rapoport, A., "The Meaning of Built Environment", The University of Arizona Press 1982, Tucson. 7. Srinivas, M. N., "Social Change in Modern India", Orient 2007 Blackswan, New Delhi. 8. Rudofsky, Bernard, "Architecture without Architects", University of New Mexico Press 1964, Albuquerque 9. Oliver, Paul, "Dwellings" Phaidon Press Limited, 2003, London 		

Department of Architecture

Course Name: Healthcare Architecture (Professional Elective-II)		
Course Code: AR-353		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
This course covers topics on various provisions and design considerations of healthcare architecture. The objective of the course is to make students aware of the policies and practices in healthcare facilities.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to healthcare architecture theory and practice in international and Indian context. Healthcare architecture development in International and Indian context: 21st century changes with digital India.	08L
UNIT-02	Healthcare architecture issues critical for present times: Globalization, Technology, Cognitive sciences, Environment, and Cultural politics. Transformation of healthcare contemporary architecture in the Indian scenario – 1920s-1950s, 1950- 1980s, 1980-2000, 21st century.	08L
UNIT-03	Health law and policies: Health policies at various levels i.e., village, district, state and national level.	08L
UNIT-04	Introduction to health care organization: Healthcare building typology, types of hospitals and various departments. Guiding principles in planning Hospital Facilities and services: clinical and non-clinical services - nursing services, public area, and staff facilities. Study of requirements for the establishment of various hospitals and medical colleges. National & International Guidelines & Standards for General Hospital & Medical College: IS Codes, BIS, IPHS, WHO, UNICEF, Joint Commission, MCI, etc.	12L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the need and importance of healthcare architecture.		
CO2: Learn about healthcare law and policies.		
CO3: Understand the fundamental principles of healthcare planning.		
Books and References		
1. Manual of Hospital Planning and Designing - For Medical administrators, Architects and Planners by Ajay Garg and Anil Dewan		
2. Hospitals: Facilities Planning and Management by G. D. Kunders.		
3. Hospitals and Health centres: Construction and Design Manual edited by - Philip Meuser.		

Department of Architecture

Course Name: Youth in Nation Building (Open Elective)		
Course Code: AR-371		
Course Type: Open Elective (OE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
This course covers topics of common subject and specialized subject of Senior Division Cadet handbook of National Cadet Corps and is primarily for NCC cadets enrolled in NCC (Army) of the Institute		
Unit Number	Course Content	Lectures
UNIT-01	NCC- Organization, Philosophy of Training, NCC Song, Incentives for NCC Cadets. National integration- Indian History and Culture, Religion and Customs, Unity in Diversity, National Integration and Importance, Youth in Nation Building Leadership- Motivation, Discipline and Duty of a good citizen, Leadership Traits, Personality /Character Development, Types of Leadership and Values/Code of Ethics, Civil affairs/Disaster management- Civil Defense Organization and its Duties, Types of Emergencies, Fire Fighting, Essential Services and their Maintenance	09L
UNIT-02	Social service- Weaker Sections of our Society and their Needs, Social Service and its need, Family Planning, HIV/AIDS: Causes & Prevention and Contribution of Youth, Drug Trafficking and Crime Health and Hygiene- Structure and Function of the Human Body, Hygiene and Sanitation, Preventable Diseases, First Aid in Common Medical Emergencies, Physical and Mental Health Environment and Ecology- Conservation of Environment and Ecology, Pollution and its Control, Forest Ecology and Pollution, Wild Life	09L
UNIT-03	Armed forces- Basic Organization of Armed Forces, Badges and Ranks, Honours and Awards Map reading- Conventional Signs, Scales, Topographical Forms and Technical Terms, The Grid System, Relief Contours and Gradients, Cardinal Points and Finding North, Type of Bearings and use of Service Protractor, Prismatic Compass	09L
UNIT-04	Field craft and Battle craft- Description of Ground, Observation and Concealment, Judging Distance, Recognition, Description and Indication of Target, Movement With & Without Arms, Field Signal, Section Formation, Fire and Movement , Fire Control Orders Communication- Communications in Army, Method of Communication, Types of Communications, Advantages/Disadvantages, Communication Media	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the need and importance of healthcare architecture.		
CO2: Learn about healthcare law and policies.		
CO3: Understand the fundamental principles of healthcare planning.		
Books and References		
1. Cadet's handbook- Common subject, DGNCC		
2. Cadet's handbook- Specialized subject (Army), DGNCC		

Department of Architecture

Course Name: Architectural Design-VI		
Course Code: AR-321		
Course Type: Professional Core (PC)		
Contact Hours/Week: 9D		Course Credits: 09
Course Objective		
To understand the importance of services and structures in design of building complexes.		
Unit Number	Course Content	Lectures
UNIT-01	Design of Auditorium or Hospital etc. with emphasis on structure and services. (Water supply, Electrification, Acoustics, Air conditioning, Firefighting etc.)	49D
UNIT-02	Design of a Multi-storied Office-cum-Commercial complex, Exhibition pavilions, or Industrial buildings, etc.	50D
UNIT-03	Time Problem related to Acoustical design process.	09D
Note:	Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem in context to the above contents. Site visits, Case study and educational tour shall be organized	
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Learn about various services and the provision of spaces for them in a building.		
CO2: Understand the working of the structure system with respect to design.		
CO3: Understand the acoustical design process.		
Books and References		
<ol style="list-style-type: none"> 1. Landscape Architecture: A manual of Site planning and design by John Ormsbee Simonds, McGraw Hill Professional, 1998. 2. Public Municipal and Community buildings by Charles K. Hoyt, Mcgraw-Hill Book Company, 1978. 3. Commercial Spaces – Cerver by FransciscoAsensio, Rotovision, 1995. 4. Cinema builders by Edwin Heathcote, Wiley-Academy, 2001. 5. Campus Architecture: Building in the Groves of Academe by Richard P. Dober, 1996. 		

Department of Architecture

Course Name: Building Estimation, Costing & Specification		
Course Code: AR-322		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To familiarize the student with the commonly used methods of preparing estimates of Architectural Projects.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to different types of specification and their uses. Importance of specification as part of Contract documents. Writing specification for civil works of the design project done during the previous Semester starting with Excavation, Earth work, Foundations, Damp proof course, Brick masonry work, Concreting, Flooring, Plastering, Painting, Doors and Windows, Painting, Varnishes, Sanitary fixtures, Electric fixtures etc.	09L
UNIT-02	Introduction to Cost estimation. Various definitions related to Cost Estimate. Introduction to the various types of Preliminary Estimates and their preparation. Introduction to the various types of Detail Estimates, methods of details of measurement and their application, item of work , measurement of typical elements, viz., Arches, Steps, and Polygonal rooms.	09L
UNIT-03	Introduction to Bill of Quantities of Materials for RCC work in slab, Beam, Column, Stair cases etc. Detailed studies to preparation of estimated cost/bill of quantities use of schedule of rates, analysis of rates and break up of material required. Illustrative examples for the same.	09L
UNIT-04	Introduction to Standard rates and their derivation from given rates. Case studies/practical expertise in preparing detailed estimates of quantities of materials and analysis of rates of materials and labor for a small residential building.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Understand the cost estimation process of various civil projects.		
CO2: Analyze the Schedule of rates for different works in a project.		
CO3: Understand the process of preparing specification report for various construction works.		
Books and References		
1. Estimating and Costing in Civil Engineering by B.N. Dutta, UBS Publishers & Distributors Ltd., 2006.		
2. Text Book of Estimating and Costing (Civil Engineering) by G.S. Birdie, Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2015.		
3. Cost Planning of Buildings by Douglas J. Ferry, Peter S. Brandon and Jonathan D. Ferry, Wiley-Blackwell; 7th editions, 1999.		
4. Building Construction Estimating by Stephen D. Schuette and Roger W. Liska, Mcgraw-Hill College, 1994.		

Department of Architecture

Course Name: Hill Architecture		
Course Code: AR-323		
Course Type: Professional Core (PC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To impart a comprehensive knowledge of the vernacular architecture, historical and environmental aspects for building up on the hills.		
Unit Number	Course Content	Lectures
UNIT-01	Historical perspective of Hill architecture and its unique attributes and concerns. Major hill settlements in various regions of the world. A broad view of traditional hill architecture of medieval European settlements and other places.	08L
UNIT-02	Traditional hill settlements in India. An overview of vernacular hill architecture of Himachal Pradesh. Building Types, techniques and materials of vernacular architecture of Himachal Pradesh. Lessons from vernacular architecture and their time-tested indigenous technology.	10L
UNIT-03	Modern buildings on hills in India. Constraints of climate, topography and availability of materials. Design factors such as access, circulation, gradients, slope analysis, grading and interpolation of contours. Structural aspects of modern buildings and necessary safeguards. Environmental and ecological concerns and safeguards.	10L
UNIT-04	Concepts of sustainability, TERI/GRIHA guidelines in achieving sustainability specifically for hills, Carrying capacity, case study of sustainable hill buildings in India.	08L
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Understand the importance of hill architecture.		
CO2: Learn the vernacular and traditional architecture of Himachal.		
CO3: Understand the role of context for modern development.		
Books and References		
<ol style="list-style-type: none"> 1. The Architectural Heritage of Himachal Pradesh: Origin and Development of Temple Styles”, Laxman S. Thakur, Munshiram Manoharlal Publishers, 1996. 2. Environment Protection of Himalaya: A Mountaineer's View by Aamir Ali, Indus Publishing Company, 1998. 3. The Survival of the Himalaya, Eco-systems- A scenario of Unsustainability by Sunder LalBahuguna, Tej Vir Singh and M.L.Sharma. 4. Himalayan Ecology, Transhumance and Social Organization Gaddis of Himachal Pradesh by Veena Bhasin, Kamla-Raj Enterprises, 1988. 5. Ecological Hazards in the Himalayas by S.K. Chadha, Pointer Publishers, 1989. 6. Temples of the Western Himalayas by Penelope Chetwode, The Architectural Review, London. 7. Site Engineering for Landscape Architects by Steven Strom, Kurt Nathan and Jake Woland, Wiley; 6thedition, 2013. 		

Department of Architecture

Course Name: Site Planning		
Course Code: AR- 324		
Course Type: Professional Ability Enhancement Compulsory Course (PAECC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
<ul style="list-style-type: none"> • To let the students understand the characteristics of sites, macro and micro impact of buildings on it and the potential/ limitations site offers to the design of buildings. • To give exposure to different frameworks, terminologies and techniques associated with site, site surveying, site analysis and site planning. 		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to site planning methods proposed by eminent planners include the scientific systematic method, the technical method, the experimental method and the context-sensitive method. Influencing Natural and Manmade Factors which govern the siting of a building or group of buildings in a given site. Data acquisition corresponding to the various governing factors.	08L
UNIT-02	Assessment of site's Physiographic, Biological, Land use, Regulatory, Cultural, and Historical context. Various methods of Site Analysis like topographical analysis overlay analysis, and spatial suitability analysis.	10L
UNIT-03	Integration, synthesis, and analysis of site with Scientific Techniques of data analysis and site programming. Codes and Building regulation for site planning (URDPFI, NBC, Model building Byelaws, and IBC). Integration of Renewable Energy Systems as per ECBC.	08L
UNIT-04	Application of all the planning techniques and methods including mapping, evaluation, analysis and development of the site on a real/ hypothetical project involving a real site. The process would include detailed site analysis, schematic site layout and development.	10L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Sensitivity towards aspects of site at macro and micro contexts.		
CO2: Ability to exploit potential of site to design the built environment.		
CO3: Ability to measure, draw, analyse and plan a particular site for a specific purpose.		
Books and References		
<ol style="list-style-type: none"> 1. Site Planning by Kevin Lynch and Gary Hack, 3rd Edition, Published by Cambridge, MA: MIT Press, 1984 2. Earthscape: Manual of Environmental Planning John Ormsbee Simonds Published by McGraw - Hill, New York, 1978 3. Site Engineering for Landscape Architects by Steven Strom, Kurt Nathan, Jake Woland, 5th Edition, Published by John Wiley and Sons, 2009 4. Site Analysis: Informing Context-Sensitive and Sustainable Site Planning and Design by James A. LaGro, Jr., 2013 		

Department of Architecture

Course Name: Architectural Journalism (Professional Elective-III)	
Course Code: AR- 341	
Course Type: Professional Elective (PE)	
Contact Hours/Week: 3L+1T	Course Credits: 04

Course Objectives

The course objective is to develop students' skills in photojournalism and architectural journalism, including writing, editing, and critical analysis of journalistic works.

Unit	Course Content	Lectures
UNIT-01	Definition of Photo Journalism, Brief History, Photographs as social Documentaries Birth of Modern Photo Journalism Since 1950 s visual awareness visual survey, EDFAT methods in using the camera, Equipment required for photo Journalism., Development of writing skills, Usages of languages and vocabulary and grammar- introduction to methodology of writing essays, news writing, précis writing, writing in architectural blog, listening comprehension, analyze talks and information gathered and to edit gathered information to build an article, Originality of topic, collecting clippings from articles, blogs and books.	09L
UNIT-02	Photo Journalism in perspective, snap shots, advance amateur photography, art photography, photo journalism, approach to photo Journalism, Newspapers and magazine design elements, page make up, layout, colour scheme, font, blurb, pictures, ads etc., other magazines, documenting of places, rural, urban, public relations	09L
UNIT-03	Key texts concerning architectural journalism and journalists to critically contrast their outputs in terms of production, content and/or presentation, to develop an ability to critically appraise selected individual pieces of journalism, awards for architectural journalism and some of the important recipients, People journalism and law-legal boundaries issues libel and invasions of privacy ethics the photo journalist on scene	09L
UNIT-04	Production of contemporary architectural journalism, building pictures, instant report, editing, editorial thinking, the picture editor, editing practices, creating drama, photo editing, documentary evolution of the word document methods and techniques, Assignments should include an article based on ability to originate plan, research, present and produce a piece of architectural journalism. The techniques and processes used in the production should be identified by the student	09L

NOTE: The time mentioned at the end of each of the above units indicates the tentative time taken to complete each unit. The marks for sessional work may be divided accordingly.

Course Outcomes

Upon successful completion of the course, the students will be able to

- CO1: Develop skills in photojournalism and writing for architectural magazines/articles.
- CO2: Understand the design elements of newspapers and magazines for photojournalism.
- CO3: Critically appraise selected architectural projects for publishing and understand legal boundaries.
- CO4: Develop skills in contemporary architectural journalism, including editing and creating drama.

Books and References

1. "Photojournalism: The Professionals' Approach" by Kenneth Kobre (2018)
2. "The Art of Writing about Art" by Suzanne Hudson (2018)
3. "The Photographer's Eye: Composition and Design for Better Digital Photos" by Michael Freeman (2007)
4. "Architectural Journalism" by Paul Goldberger (2007)
5. "The New Journalism" by Tom Wolfe (1990)

Department of Architecture

Course Name: Structural Systems in Architecture (Professional Elective-IV)		
Course Code: AR-342		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L+1T		Course Credits: 04
Course Objectives		
At the end of this course, the students should be able to understand the relationship between structure and form in architecture, and to develop their knowledge of various structural systems and their application in the design and construction of buildings.		
Unit Number	Course Content	Lectures
UNIT-01	Construction and form, Structure and Form Equilibrium under simple tension or compression, the catenary and the arch, the simply supported beam, the domical shell, Structural elements: Beams and slabs Arches and catenaries, vaults, domes and curved membranes, Trusses, Portal frames and space frames	09
UNIT-02	Relation between structure and architecture, Geometry of form and structural function, Aesthetic theories of the expression of structural function in architectural form	09
UNIT-03	Single- and double-layer grids, braced domes, ribbed domes, plate type domes, Network domes, Lamella domes, Geodesic domes, Grid domes, Braced and folded structures	09
UNIT-04	Space frames, folded plates, shells, cyclonical shells, Hyperbolic paraboloids, free forms, Cable structures, simply curved suspended roofs, combination of cables and struts, Curtain walls, Types of curtain walls and their components structural problems, construction and erection	09
NOTE: The time mentioned at the end of each of the above units indicates the tentative time taken to complete each unit. The marks for sessional work may be divided accordingly.		
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the principles of load distribution in different structure systems		
CO2: Understand the relationship between structure, architecture, and aesthetics.		
CO3: To rationally design structures as per the design requirements		
Books and References		
1. Candela Felix Architectural and Structuralism 1963		
2. Lane Allen Developments in Structural Form Penguin Books Ltd London 1975		
3. Macdonald J Angus Structure and Architecture 2nd ed Architectural Press Oxford 2003		
4. Michaels Leonard Contemporary Structures in Architecture 1950		
5. Schall Rolf Curtain Walls Design Manual Reinhold Pub New York 1962		
6. Siegel Curt Structure and Form in Modern Architecture Crosby Lockwood and Son Ltd London 1962		
7. Subramanian N Principles of Space Structures Wheeler and Co Allahabad 1983		
8. Zannos Alexander Form and Structure in Architecture The role of statical functions Van Nostrand Reinhold Co New York 1987		

Department of Architecture

Course Name: Sustainable Settlement Pattern for Climate Resilience (Professional Elective-VII)		
Course Code: AR-343		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To explore the existing vernacular settlement pattern for climate resilience and risk impacts on settlements over the time. Studying the urban settlement pattern and pertaining issues.		
Unit Number	Course Content	Lectures
UNIT-01	Climatically Resilient planning for hill settlements; Introduction, Components of natural and built environment, Eco-systems and their relevance to environment, human settlements, Modifications in natural environment, causes and consequences, evolution and significance.	12L
UNIT-02	Existing Scenario: Case Studies, Impact of urbanization on settlements, Urban ecosystem approach	12L
UNIT-03	Site Study I: Urban Settlement Pattern of any town in Hilly region.	06L
UNIT-04	Site Study II: Vernacular Settlement Pattern of any village in Himachal.	06L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the Impact of Inorganic growth patterns in Hilly region.		
CO2: Understand the climate resilience and its importance in growing settlements.		
CO3: Understand the vernacular settlement examples and implementations.		
Books and References		
1. Town & Country Planning office Shimla, Draft Development plan for Manali Planning area 2021, 2005.		
2. Kullu District Disaster Management Plan 2017.		
3. Human Settlements and Climate Change, Jelena Živković.		
4. Planning strategies for hill stations in eco-sensitive zones by S.P. Sekar, M. Thirumeni, Spatio-Econ. Dev. Rec., 9 (2) (2002), pp. 35-37.		
5. Introduction to Settlement Geography by V.N.P. Sinha, Usha Verma, Anuradha Sahay.		

Department of Architecture

Course Name: Building Regulations (Professional Elective-IV)		
Course Code: AR-361		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To familiarize the student with the regulatory system of construction on site.		
Unit Number	Course Content	Lectures
UNIT-01	Legislative process –General Concept of Law: Source of law. Meaning of terms of law, legislation, ordinance, Bill, Act, code, standard, guidelines and Regulations and Bye-laws. Importance and benefits of building regulations, urban sociology	06L
UNIT-02	Provisions of regulations as per National Building Code 2016 Standards for residential buildings, Building by-laws of local authority, standards for industrial, public, commercial, and institutional buildings. Local/regional and global case studies on planning and implementation mechanism- building bye laws, development controls and zoning regulations.	12L
UNIT-03	Regulatory types and their advantages and disadvantages Role of Regulatory structure, Enforcement criteria and detailed Technical requirements in development of effective regulations. Regulatory assessment and revision schedule.	06L
UNIT-04	Various national building standards, guidelines and regulations in India	12L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Develop a good understanding of legislative process and importance of Building Regulations		
CO2: To understand the importance of various provisions under Building Regulations and their benefits		
Books and References		
<ol style="list-style-type: none"> 1. "Urban Planning, Anthony James Catanese, James C. Snyder; McGraw-Hill, 1988 2. Introduction to planning practice Allmendinger, Prentice Hall of India, 2000 3. Town and Country Planning, Abercombe P, 3rd Edition, Oxford University Press, 2004 4. Urban and Regional Planning in India: A Handbook for Professional Practice, SK Kulshrestha 5. The Urban Sociology Reader, Jan Lin, Christopher Mele, 2003 6. National Building Code 2016, BIS India 7. UDPFI Guidelines, Ministry of Urban Affairs and Employment, GoI 8. Energy Conservation Building Code (ECBC), 2007 9. GRIHA Manuals (Vol. 1-5), Teripress, New Delhi, 2003 10. Handbook of Energy conscious Buildings of India (HECB), MNRE, GoI, 2005 		

Department of Architecture

Course Name: Behavioural Architecture (Professional Elective IV)		
Course Code: AR-362		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
<p>This course covers topics on importance of understanding people and their perception of environment in architectural design and planning. The objectives of the course are -</p> <ul style="list-style-type: none"> • To impart knowledge about this relatively new field, born out of the synthesis between architecture and behavioural psychology. • To expose the students to the importance of understanding people and their perception of environment in architectural design and planning. • To enable them to understand the various psychological aspects that can be incorporated in the design of built environment. 		
Unit Number	Course Content	Lectures
UNIT-01	<p>Introduction to Environmental Psychology and Behavioral Architecture Introduction to Environmental Psychology; Origin, principles and relevance of environment psychology, its difference from other branches of psychology; Theories and approaches in environmental psychology. Relation between human psychology and design of built environment; Elements of design (point, line, shape, etc.), Principles of architecture (rhythm, balance, contrast, etc.) and its role in evoking emotions. Concept of perception; Visual perception; Theories on environmental perception, Environmental perception and design.</p>	09L
UNIT-02	<p>Behavioral mapping methods: Traditional observation and mapping methods- i.e. surveys, cognitive mapping, visual mapping etc. Digital observation Methods for Human tracking and interaction detection – i.e. Visual sensors and radio frequency sensors etc. Comparison of digital versus traditional observation methods. Different presentation methods – i.e. Process organization chart, affinity matrices, pictograms: behavioral design process model, EDRA etc.</p>	09L
UNIT-03	<p>Urban Environment: Different environments - Educational (class room design, ambient noise, attention), Workplace (types of office design), Health care, Commercial, Recreational, Public, Domestic, Urban, etc.; Multi-sensory spaces; Case studies.</p>	09L
UNIT-04	<p>Different Theories and concepts – i.e. Neighborhood concept & Neighborhood satisfaction theory. Place attachment theory, ecology of a neighborhood park and playground, cross-cultural issues, social & psychological issues in the planning of new towns, environmental perceptions and migration, Environmental cognition.</p>	09L
Course Outcomes		
<p>Upon successful completion of the course, the student will be able to:</p> <p>CO1: Have an understanding of the multiplicity of living patterns, activities, geometric patterns in space</p> <p>CO2: Get knowledge about the behavioral design process, techniques and design contexts.</p> <p>CO3: Have an understanding of different concepts and theories related to design and human behavior.</p>		
Books and References		
<ol style="list-style-type: none"> 1. Burnette, C. (1971). Architecture for human behavior. Philadelphia Chapter: AIA. 2. Canter, D. and Lee, T. (1974). Psychology and the built environment. New York: Halstead Press. 3. Christopher, A. et al. (1977). A Pattern Language. New York: Oxford University Press. 4. Clovis, H. (1977). Behavioral Architecture. McGraw Hill. 5. Lynch, K. (1973). The image of a city, Cambridge: MIT. 		

Department of Architecture

Course Name: Applications of GIS in Architecture and Planning (Professional Elective-IV)		
Course Code: AR-363		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To provide exposure to the emerging concepts and role of GIS Applications concerning current and future development.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Geographic Information Systems (GIS), the concept of earth surface projections and geoids; limitations of DBMS, engineering drawings and CADD packages - the need for GIS, Spatial and non-spatial data, raster and vector data.	06L
UNIT-02	Components of a GIS; spatial and attribute data- input and output. Various GIS packages and their salient features, Geographical coordinate systems, Map projections, Projected coordinate system.	06L
UNIT-03	Vector data model, raster data model, elements of raster data model, Data conversion, Integration of raster and vector data, Data input, Geometric transformation, spatial data editing, Data exploration, Vector and raster data analysis, Role of remote sensing in GIS.	09L
UNIT-04	Spatial data analysis - buffer, overlay, 3D analysis and modeling; Emerging and advanced technology - web-enabled GIS, GPS tracking and monitoring, model builder, transparency through GIS, community participation through GIS, monitoring and management.	09L
UNIT-05	Applications of GIS for various natural resources mapping, monitoring, and analysis for design and planning applications.	06L
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Course will develop an understanding of the concepts and role of GIS Application in architecture and Planning		
Books and References		
<ol style="list-style-type: none"> 1. Garbrecht, J., Martz, L.W., (2000). Digital Elevation Model Issues in Water Resources Modeling. in Hydrologic and Hydraulic Modeling Support with Geographic Information Systems (2000) ESRI Press 2. Greene, R.R., 2002. Confronting Catastrophe: A GIS Handbook. ESRI Press. 3. Maidment, D.D., 2002. Arc Hydro: GIS for water resources. ESRI Press. 4. K.T. Chang, 2008, Introduction to Geographical Information systems 		

Course Structure and Syllabi

For

Bachelors Programmes

(B.Arch.)

Fourth Year



राष्ट्रीय प्रौद्योगिकी संस्थान हमीरपुर

National Institute of Technology Hamirpur

Hamirpur - 177 005 (India)

<http://www.nith.ac.in>

July, 2023 Onwards

Fourth Year

7th Semester

8th Semester

SN	Code	Subject	L	T	P	D	Credits	SN	Code	Subject	L	T	P	D	Credits		
1	AR-411	Architectural Design-VII	0	0	0	9	9	1	AR-421	Architectural Design-VIII	0	0	0	9	9		
2	AR-412	Landscape Architecture	3	1	0	0	4	2	AR-422	Urban Design	3	1	0	0	4		
3	AR-413	Energy Efficient Architecture	3	1	0	0	4	3	AR-423	Earthquake Resistant Building Design	3	1	0	0	4		
4	AR-414	Ekistics	3	1	0	0	4	4	AR-424	Professional Practice	3	1	0	0	4		
5	DET	Professional Elective-V	3	1	0	0	4	5	AR-425	Building Services III	3	1	0	0	4		
6	DET	Professional Elective-VI	3	1	0	0	4	6	DET	Professional Elective-VII	3	1	0	0	4		
Total			Hours =				29	29	Total			Hours =				29	29

Department of Architecture

Course Name: Architectural Design-VII		
Course Code: AR-411		
Course Type: Professional Core (PC)		
Contact Hours/Week: 9D	Course Credits: 06	
Course Objective		
To make the students aware of design issues related to problems of Housing/ Institutional complex in context to Site Planning.		
Unit Number	Course Content	Lectures
UNIT-01	Designing & planning of Neighborhood Unit in urban area or suburbs with respect to: Unit orientation, Cluster formation, Open space: size, hierarchy & township. Circulation: Pedestrian, walkway, cycle tracks, hierarchy of roads, road layout system. Integrating building services in a unit cluster.	54D
UNIT-02	Design of a University Campus / redevelopment projects etc. Site may be chosen in different climatic conditions in India.	54D
Note:	Two design problems are to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems with reference to the above contents.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the basics of neighbourhood planning.		
CO2: Understand the basics of campus planning.		
Books and References		
<ol style="list-style-type: none"> 1. "Mane" A New Initiative in Public Housing, Hudco Publication, New Delhi. 2. Housing and Urbanization by Charles Correa, Thames & Hudson, 2000. 3. Time saver standards for Housing and Residential development by De Chiara, Panero & Zelnik, Tata McGraw-Hill Education, 2009. 4. Time Saver Standards for Building Types by John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York, 1983. 5. Campus Architecture: Building in the Groves of Academe by Richard P. Dober, 1996 6. Campus & Community, Moore Ruble Yudell Architecture and Planning by Rockport Publishers, Inc., 1997. 7. People Places: Design guidelines for urban open spaces by Clare Cooper Marcus, Carolyn Francis (Eds.), John Wiley & Sons, 1998. 		

Department of Architecture

Course Name: Landscape Architecture		
Course Code: AR-412		
Course Type: Professional Core (PC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
This course is aimed at providing a comprehensive knowledge regarding ecological aspects and environmental concerns in landscape design besides the advanced knowledge of elements of landscape design.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to the elements of landscape such as Earth form, Water and Vegetation, etc. and their effects in relation to the built environment. Plant types, characteristics, structure and color of foliage.	06L
UNIT-02	History, nature, scope and purpose of designed open space. Exposure to historical landscape (English, French, Italian, Chinese, Japanese, Mughal, Ancient India) and their relevance in their time, context and social needs. Introduction to ecology and its importance to Landscape designers.	06L
UNIT-03	Site analysis and site structure unity. Advanced knowledge of elements of Landscape Design and their effects in context to the environmental concerns. Basic knowledge of contour/mapping and various methods of documentation of physical features, topography and landscape elements.	12L
UNIT-04	Case studies of varied urban situations having typical landscape characters. Study of Chandigarh and Delhi region to analyze and assess their present landscape status by applying knowledge and techniques acquired as above. Landscape design proposal based on above mentioned analysis as an exercise.	12L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the elements of landscape.		
CO2: Understand the origin and evolution of landscape design.		
CO3: Understand importance of site analysis.		
CO4: Apply process of landscape design.		
Books and References		
1. Time-saver standards for landscape architecture: design and construction data by Nicholas T. Dines, Kyle D. Brown; McGraw-Hill, 1998		
2. Landscape design: a practical approach by Leroy G. Hannebaum; Reston Pub. Co., 1981		
3. Landscape design: an international survey by Ken Fieldhouse; Overlook Press, 1993		
4. Landscape Detailing, Micheal Littlewood; Routledge, 2001		
5. Planting Design by Theodore D. Walker; John Wiley & Sons, 1991		
6. Landscape Architecture Construction by Harlow C. Landphair, Fred Klatt; Prentice Hall PTR, 1999		
7. Landscape As Inspiration by Hans Dieter Schaal; Academy Editions, 1994		
8. Introduction to Landscape Design by John L. Motloch; John Wiley & Sons, 2000		
9. Landscape Architecture: A Manual of Site Planning and Design by John Ormsbee Simonds; McGraw Hill Professional, 1998		
10. Trees of Chandigarh by Chhatar Singh, Rajnish Wattas, Harjit Singh Dhillon; B.R. Publishing Corporation, 1998		

Department of Architecture

Course Name: Energy Efficient Architecture		
Course Code: AR-413		
Course Type: Professional Core (PC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To familiarize the students with role of energy in built environment and ways to achieve energy efficiency in design process.		
Unit Number	Course Content	Lectures
UNIT-01	Types, availability and resources of conventional and non-conventional energy sources. Energy Conservation, Indian Energy Conservation Act 2001 Features, Energy Star Rating of buildings and equipment's, Bureau of Energy Efficiency.	10L
UNIT-02	Energy Conservation Building Code (ECBC). Energy Building Code, Guidelines: Thermal Insulation, Heating, Ventilation and Air-Conditioning System, Building Lighting Design: lighting levels, efficient light options, CFL, LEDs, Fixtures, Day lighting timers, Building Energy Management.	10L
UNIT-03	Introduction to Building rating systems in India. Detailed study on LEED and GRIHA (Green Rating for Integrated Habitat Assessment).	08L
UNIT-04	Case study: National and International examples.	08L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the concept and need of energy efficiency.		
CO2: Understand ECBC, ECA 2001, LEED, GRIHA.		
CO3: Learn the different case studies on energy efficient buildings in India and abroad.		
Books and References		
1. Renewable Energy Sources and Their Environmental Impact by Shahid A. Abbasi, Naseema Abbasi; PHI Learning Pvt. Ltd., 2004		
2. Energy efficient buildings: architecture, engineering and environment by Dean Hawkes, Wayne Forster; W.W. Norton & Company, 2002		
3. Indian Energy Conservation Act 2001, Gol		
4. Energy Conservation Building Code Manual, Gol		
5. GRIHA Manuals, The Energy and Resources Institute (TERI), 2011		
6. Energy-efficient Buildings in India, The Energy and Resources Institute (TERI), 2001		

Department of Architecture

Course Name: Ekistics		
Course Code: AR-414		
Course Type: Professional Core (PC)		
Contact Hours/Week: 3L + 1T		Course
Credits: 04		
Course Objective		
This course intends to develop an understanding the evolution of settlement planning.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction: Meaning and Scope in Relation to Town Planning and Architecture. Settlement patterns in later periods of history; Changing form and pattern of human settlements in ancient, medieval, colonial and modern India. Planning of Medieval Indian Towns such as Bhopal Jaipur and Delhi	06L
UNIT-02	Role and contribution of the following towards contemporary town planning thought- Patrick Geddes, Patrick Abercrombie, Daniel Burnham, Soria Y Mata, Edwin Lutyens, CA Doxiadis, Ebenezer Howard, Le Corbusier, Frank Lloyd Wright,	12L
UNIT-03	Globalization and its impact on cities – Urbanization, emergence of new forms of developments – self sustained communities – SEZ – transit development – integrated townships – case studies. Scope and Content of Master plan – planning area, land use plan and Zoning regulations – zonal plan – need, linkage to master plan and land use plan – planned unit development (PUD) – need, applicability and development regulations - Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – JNNURM – case studies. Definition and explanation of the concepts of density, FAR, land use and zoning.	12L
UNIT-04	Emergence of the metropolitan phenomenon; Planning problems of cities and Solutions Rural and regional Systems: The rural-urban relationships; Problems of rural systems.	06L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the process of evolution of a settlement of various historical settlements.		
CO2: Identify the role of settlements growth in Modern day town planning and various new forms of developments.		
CO3: Learn about the technicalities in drafting a Master plan and implementation of various government schemes.		
CO4: Understand the concept of design regulations like FAR, land use etc. and various problems of rural and urban cities.		
Books and References		
1. Ekistics - An Introduction to the Science of Human Settlements by C.L. Doxiadis, Hutchinson, London, 1968.		
2. Housing and Urban Renewal by Andrew D. Thomas, George Allen and Unwin, Sydney, 1986.		
3. Ministry of Urban Affairs and Employment by Government of India, New Delhi, 1999.		
4. Town and Country Planning by Patrick Abercrombie, 3rd Edition, Oxford University Press.		
5. Design of Cities by Edmund N. Bacon, Penguin Books; Revised edition, 1976.		
6. An Introduction to Town & Country Planning by A.J. Brown and H.H. Sherrard, Angus and Robertson, Sydney, 1969.		

Department of Architecture

Course Name: Building Maintenance (Professional Elective-V)		
Course Code: AR-431		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To understand historical building types and their conservation and a thorough knowledge of Building Maintenance can substantially contribute towards adequacy of design and suitability of materials.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction: Maintenance defined. Need and Importance of building maintenance. Its economic and social significance. Categories of maintenance: Planned maintenance, preventive maintenance, running caretaker maintenance, PWD patter of maintenance; A/R and S/R, maintenance cycles, maintenance profiles	09L
UNIT-02	Maintenance Generators: Climatic conditions; usages, defects in original design/construction, changing standards and tastes. Maintenance standards, determinants of maintenance standards, statutory standards, defective premises act, building bylaws & act, legislative controls, building & housing act.	09L
UNIT-03	Organizing Maintenance; Managing maintenance, Financing & Budgeting for maintenance. Understanding technology and techniques involved in maintenance. Execution of maintenance work. Controlling costs. Information systems in maintenance. Inspections: annual, periodical, special, checklist and proformas. Creating database for maintenance, maintaining building registers, inventories, inspection reports, records, User complaints, buildings in danger.	09L
UNIT-04	Understanding building defects & ailments, examining symptoms of various types and patterns of buildings disease and ailments, structural, non-structural finishes, stains, services ailments, leakages & dampness, corrosion protection, Sulphate attacks. Diagnosing & determining causes, prescribing effective remedial action.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the importance of building maintenance.		
CO2: Learn the standards, financing, and budgeting for maintenance.		
CO3: Diagnose the causes of building defects and apply the ailment methods.		
Books and References		
1. Repair and Renovation of Modern Buildings by Ian Chandler		
2. A Manual of Maintenance Engineering by B. S.Nayak		
3. Maintenance and Repairs of Buildings by P.K.Guha		
4. Building Services Handbook by Hall, Fred		

Department of Architecture

Course Name: Futuristic Architecture and Tall Buildings (Professional Elective-V)		
Course Code: AR-432		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To impart knowledge about the design approach and the special service requirements of Tall Buildings; and to create awareness about the impacts of tall buildings in the urban environment.		
Unit Number	Course Content	Lectures
UNIT-01	To impart knowledge about the Future concepts envisioned by earlier theorists and architects like Antonio Saint Elia and F.L. Wright. Review of their design philosophy with respect to Futuristic needs and culture transformation during industrial revolution due to futuristic building materials and construction technologies.	08L
UNIT-02	Introduction to the need of vertical density, in context with the Population, Global competition and globalization, Urban regeneration, Agglomeration, Land prices, Land consumption, Energy and climate change, Transportation and infrastructure, Human aspirations, symbolism, ego and Emerging technologies etc.	10L
UNIT-03	Design approach to tall buildings i.e. Design Quality (Form and aesthetics), Anatomy of the Tall Buildings, Physical components, Quality in Space Programming, Community spaces, Access and egress, Engineering Systems, Environmental control systems, Microclimates around Tall Buildings, Security, Management and Operations, Effect of design and occupancy on building operations.	08L
UNIT-04	Affect Assessment of Tall Buildings w.r.to Economics, Urban Environment, Civic infrastructure, Socio-cultural factors, Perception, Public safety concerns, Historic context, place making and Digital revolution.	10L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the impacts of Socio political factors on Architectutre.		
CO2: Conceptualize and design Tall buildings.		
CO3: Learn to analyse the impact of Tall Buildings on Urban environments.		
Books and References		
<ol style="list-style-type: none"> 1. K.A1-Kodmany, "The Future of the City: Tall Buildings." 2. Basem M.M., "Construction Technology for High Rise Buildings: Handbook", 2014, Create Space. 3. Mark Sarkisian, "Designing Tall Buildings: Structure as Architecture" Routledge, New York, 2012. 4. Johann Eisele & Ellen Kloft, "High-rise Manual: Typology and Design, Construction, and Technology" Birkhuser, 2003. 5. Nigel Clark and Bill Price, "Tall Buildings: A Strategic Design Guide", RIBA & BCO, 2016. 		

Department of Architecture

Course Name: Industrial Architecture (Professional Elective-V)		
Course Code: AR-433		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To understand the requirement of adaptability and flexibility in design to accommodate new technology and changes necessary in industrial development. The course aims to focus on the study of design considerations, environmental factors, structural considerations and safety controls for industrial buildings.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Industrial Architecture: Historic development of industrial architecture; Role of architects in the design of modern industrial buildings; Basic knowledge of types and categories of industries; Considerations for development of master plan for industrial areas and site selection; Design criteria for site layout, loading and unloading area.	09L
UNIT-02	Design considerations: Design considerations in development of industrial buildings - flexibility, adaptability, structural selection. Integration of structure and services, roof lighting, internal circulation and material handling; Alternative technologies and materials for industrial use.	09L
UNIT-03	Environmental considerations: Working environment for industrial workers which will contribute to comfort and productivity by considering - work space and ergonomics, use of colour, lighting design, noise and vibration, thermal comfort conditions, ventilation, building fabric, Visual environment and landscaping. Safety, security and warning control. Consideration of other facilities like rest room, locker room, sanitary, changing room, cafeteria, recreational etc. Health, welfare and child care in industrial premises.	09L
UNIT-04	Large span construction: flat slabs-shell structures, folded plates, portal frames, space frame & trusses, tensile structures. Pre-fabricated construction & pre-engineered building; new material in construction, cold form sections.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Have a basic understanding of industrial typology.		
CO2: Learn the design considerations for industrial buildings.		
Books and References		
<ol style="list-style-type: none"> 1. A Design Manual- Industrial Buildings by J. Adam, K. Hausmann and F. Juttner. 2. Industrial Psychology, CBS, Delhi by M. L. Blum and J. C. Naylor. 3. The Best in Industrial Architecture by A. Philips. 4. Cleaner Production-Greening of Industries for Sustainable Development by R. K. Sinha and S. Heart. 5. Factories- Planning, Design and Modernization by J. Drury 		

Department of Architecture

Course Name: Low-Cost Building (Professional Elective-VI)		
Course Code: AR-451		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To make the students aware of the use of conventional and non-conventional resources for low cost construction.		
Unit Number	Course Content	Lectures
UNIT-01	Need for low-cost construction, both in the rural and the urban sectors. An introduction to various building techniques adopted in different climatic zones of the country, which result in varied vernacular expressions.	09L
UNIT-02	Use of cost-effective technologies including the use of local materials, up gradation of traditional technologies, prefabrication etc.	09L
UNIT-03	Innovations of building techniques for low-cost construction. Analysis of space norms for low-cost buildings.	09L
UNIT-04	Study of usage pattern of low-cost buildings by the habitants. Comparative analysis of building materials and costing. Works of Laurie Baker, Hassan Fathy and other prominent architects.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand low cost building materials and techniques in construction.		
CO2: Learn the space norms for low cost buildings.		
CO3: Understand the works of architects working in field of Low cost buildings.		
Books and References		
1. Building Systems for Low Income Housing by Ashok Kumar Jain; Management Publishing House, 1992		
2. Low Cost Housing in Developing Countries by Guru Charan Mathur; For Centre for Science & Technology of the Non-Aligned and Other Developing Countries, Oxford & IBH Publishing Company, 1993		

Department of Architecture

Course Name: Intelligent Buildings and Automation (Professional Elective-VI)		
Course Code: AR-452		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To impart knowledge about the design approach and the special service requirements of Intelligent Buildings. The course outcome will create awareness about the impacts of Intelligent building System on energy optimization, safety and security control management in the buildings.		
Unit Number	Course Content	Lectures
UNIT-01	Definition and concept of intelligent building systems, History and evolution of intelligent buildings -Benefits and challenges of intelligent buildings -Basic components and technologies of intelligent buildings (like sensors, agents and actuators etc) Types of Control systems, Direct and Feedback Systems, Understanding the process of feedback systems,	08L
UNIT-02	Building Automation Systems - Components and functions of building automation systems (BAS) and Energy management systems (EMS), communication protocols used in services control, remote monitoring and management. Home automation. Control systems in vertical transportation, remote elevator monitoring - Design and implementation of BAS, Integration of BAS with other building systems - Case studies of BAS in intelligent buildings - Types of Control strategies for energy efficiency and comfort Integration with other building systems such as HVAC, lighting, and security,	08L
UNIT-03	Introduction to advanced building technologies -Smart lighting systems -Intelligent HVAC systems, Climate control stair pressurization, night purging. -Building security and access control systems -Building information modeling (BIM) and virtual reality (VR) technologies -Integration of advanced building technologies in intelligent buildings	10L
UNIT-04	Designing and Evaluating Intelligent Buildings -Introduction to Sustainable design strategies for intelligent buildings -Principles of intelligent building design -Criteria for evaluating intelligent buildings -Tools and techniques for evaluating the performance of intelligent buildings -Case studies of successful intelligent building design and evaluation	10L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand advanced systems used in buildings		
CO2: Developed knowledge of sustainable buildings, energy efficiency, zero energy buildings and Intelligent Building Systems.		
CO3: understand the design and operation strategies for future intelligent Building systems.		
CO4: Understand recent developments in building automation.		
Books and References		
<ol style="list-style-type: none"> 1. Intelligent Buildings: Design Management and Operation by Clements, Derek, Croome, Thomas Telford, Ltd. 2. Visionary Architecture: Unbuilt Works of the Imagination by Burden, Ernest, McGraw-Hill Professional. 3. Intelligent Building and Building Automation by Shengwei Wang , Spon press 4. Control Systems Engineering by Norman S. Nise , 2019 5. Feedback Control of Dynamic Systems" by Gene F. Franklin, J. Da Powell, and Abbas Emami-Naeini, 2014 6. HVAC Control Systems by Ronnie J. Auvil , 2013 7. Electric Power Distribution Handbook by T.A. Short, 2014 8. Building Automation: Control Devices and Applications by In Partnership with Honeywell, 2013 9. Building Engineering and Systems Design by Frederick S. Merritt, 2012 		

Department of Architecture

Course Name: Theory of Design (Professional Elective-VI)		
Course Code: AR-453		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To understand the development of Architecture in 20th century.		
Unit Number	Course Content	Lectures
UNIT-01	Study of work of the early 20th century architects like Philip Johnson, Eero Saarinen, Oscar Niemeyer, Jom Utzon, P.L. Nervi and Master architects , Le Corbusier, Frank Lloyd Wright, Mies van der Rohe and Walter Gropius.	08L
UNIT-02	Study of Late and Post Modernism through the work of Robert Venturi, Richard Rogers, Renzo Piano etc Introduction to Post Independence (Modern) architecture in India. Contribution of Le Corbusier and Louis Khan.	10L
UNIT-03	Study of the works done by the pioneers in Indian Architecture: Raj Rewal, Charles Correa, B.V. Doshi, A.P. Kanvinde, Ananth Raje, Louis Kahn, Joseph Allen Stein, U.C Jain, Laurie Baker, Ranjit Sabhiki, Sachdev Eggleston etc.	10L
UNIT-04	Study of the works done by Dean D Cruze, Hafeez Contractor, Nari Gandhi, Hasmukh & Bimal Patel. Study of the works done by Contemporary western architects: Norman Foster, Frank O Gehry, Zaha Hadid, Moshe Safdie, etc.	08L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the architectural characteristics of Late and Post Modernism.		
CO2: Understand the architectural characteristics of Modern architecture in India.		
CO3: Understand the evolution of architecture from 20 th century & architectural styles of various modern architects.		
Books and References		
<ol style="list-style-type: none"> 1. A History of Architecture by Sir Banister Fletcher, CBS Publisher, 1999. 2. Housing and Urbanisation: Building Ideas for People and Cities by Charles Correa, Thames & Hudson Ltd., 2000. 3. Documenting Chandigarh by Kiran Joshi, Mapin Publishing, 1999. 4. Modern Architecture: A Critical History by Kenneth Frampton, Thames & Hudson; 4th Edition, 2007. 5. The Details of Modern Architecture (Volume 1) by Edward R. Ford, The MIT Press, 2003. 6. Twentieth Century Architecture: A Visual History by Dennis Sharp, Images Publishing, 2006. 7. Architecture and Independence: The Search for Identity--India 1880 to 1980 by Jon Lang, Madhavi Desai and Miki Desai, Oxford University Press, 1998. 8. Architecture in the Twentieth Century by Peter Gössel and Gabriele Leuthäuser, Taschen, 2001. 9. History of Architecture: From Classic to Contemporary by Barbara Borngasser, Parragon Inc; Reprint edition, 2010. 		

Department of Architecture

Course Name: Architectural Design VIII		
Course Code: AR-421		
Course Type: Professional Core (PC)		
Contact Hours/Week: 12D		Course Credits: 06
Course Objective		
To make the students aware of Urban Design issues.		
Unit Number	Course Content	Lectures
UNIT-01	Design an urban design scheme for any urban problem with emphasis to contextual issues. Design & plan of Urban agglomeration, Urban Haat etc.	84L
UNIT-02	Design of a Transport Terminal, Convention centre etc.	60L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand urban spaces and theories.		
CO2: Design an urban facility.		
Books and References		
1. The Image of the City by Kevin Lynch, The MIT Press, First Edition, 1960		
2. The Urban Pattern: City Planning and Design by Arthur B. Gallion & Simon Eisner, Van Nostrand, Second Edition, 1963		
3. People Places: Design Guidelines for Urban Open Space by Clare Cooper Marcus & Carolyn Francis, Van Nostrand Reinhold Company, First Edition, 1990		
4. Urban Design: Green Dimensions by J.C. Moughtin & Peter Shirley, Architectural Press, First Edition, 1996		
5. City Planning: Arco colour Urban Architecture (Arco colour collection) by Asensio Cervera & Francisco, Arco Editorial, 1996		

Department of Architecture

Course Name: Urban Design		
Course Code: AR-422		
Course Type: Professional Core (PC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To understand the principles and applications of urban design.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to Urban Design, its Principles and Techniques, Scope of Urban Design. Emergent concepts in Urban Design, History & Heritage of Urban Design. Urban Design vocabulary, Elements of Urban Design. Concept of Urban Redevelopment, Urban Renewal and Urban Regeneration.	08L
UNIT-02	Importance of context in Urban design (Context analysis, regional study and project understanding). Impact of Factors such as economy, politics, religion and regional on urban design. Gentrification and social Imbalance. Concepts to be kept in mind (Gender issue, elderly People and Child) while designing.	08L
UNIT-03	Study of Futuristic city and new urbanism. Concept of Neighbourhood planning. Study of existing urban developments.	10L
UNIT-04	Urban design exercises.	10L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the introduction to urban design		
CO2: Understand the concepts of urban design		
CO3: Understand urban spaces and theories		
CO4: Understanding practical aspects of an urban area		
Books and References		
1. Urban Design: Green Dimensions by J. C. Moughtin & Peter Shirley, Architectural Press, First Edition, 1996		
2. A New Theory of Urban Design (Center for Environmental Structure Series, Vol 6) by Christopher Alexander, Hajo Neis, Artemis Anninou & Ingrid King, Oxford University Press, 1987		
3. The Urban Design Handbook: Techniques and Working Methods by Ray Gindroz, Urban Design Associates, 2003		
4. Urban Design: Street and Square by J. C. Moughtin, Architectural Press, Third Edition, 2003		
5. Urban Spaces, No. 4 by John Dixon, Visual reference publication, 2006		

Department of Architecture

Course Name: Earthquake Resistant Building Design		
Course Code: AR-423		
Course Type: Building Sciences and Applied Engineering (BS and AE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To let the students, understand the terminology used in earthquake and its effects on structural and non-structural elements.		
Unit Number	Course Content	Lectures
UNIT-01	Earthquake occurrence in the world, plate tectonics, faults, earthquake hazard map of India and the states. Causes of earthquake, seismic waves, magnitude, intensity, epicenter and energy release, characteristics of strong earthquake ground motion.	09L
UNIT-02	Earthquake effects: On ground, soil ruptures, liquefaction and landslides. Behavior of various types of Buildings, structures, power plants, switchyards, equipment, life lines and collapse patterns. Behavior of Non-Structural Elements like services, fixtures, mountings.	09L
UNIT-03	Building forms: Horizontal and Vertical eccentricities, mass and stiffness distribution, soft storey, etc. Plan and vertical irregularities, redundancy and setbacks. Concept of Seismic design, stiffness, strength period, ductility, damping, hysteric energy dissipation, center of mass, center of rigidity, torsion, design eccentricities. Ductility based design: Design of energy absorbing devices. Seismic based isolation and seismic active control. Contemporary international approaches.	09L
UNIT-04	Introduction to various IS codes. Various types and construction details of Foundation, Soil stabilization, retaining walls, underground and overhead tanks, staircases and isolation of structures. Methodologies for seismic retrofitting.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the concept of earthquake and its effect on buildings		
CO2: Understand the building forms and seismic design		
Books and References		
<ol style="list-style-type: none"> 1. Disaster Management in the Hills by Dr. Satendra, Concept Publishing Company, 2003. 2. Disaster Management by Harsh K. Gupta, Universities Press, 2003. 3. Natural Hazards and Disaster Management: Vulnerability and Mitigation by R. B. Singh, Rawat; Reprint edition, 2006. 4. Proceedings of the National Conference on Disaster & Technology, 1998, Manipal, India", Nirmita Mehrotra, 1998. 5. Disaster Risk Reduction in South Asia by Sahni, Pardeep, Ariyabandu and Madhavi Malalgoda, PHI Learning, 2003 		

Department of Architecture

Course Name: Professional Practice		
Course Code: AR-424		
Course Type: Professional Ability Enhancement Compulsory Course (PAECC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
Introduction to the professional, vocational and legal aspects of architectural practice and profession		
Unit Number	Course Content	Lectures
UNIT-01	Architectural professional association, its role and responsibilities. Introduction of Architects Act 1972. Council of Architecture – its role and responsibilities. Code of professional conduct. Condition of engagement and scale of professional fees. Copyright Act as applicable to architectural work. Architectural competitions.	12L
UNIT-02	Contract –Types, Preparation of contract documents general conditions of contract, interim certificates defect liability period, retention amount and virtual completion. Duties and liabilities of architects, contractors. Articles of agreement, execution of work payment and Arbitration. Tenders – types and the process of calling, security and selection system. Pre- Tender qualifications and registration of contracts. Office organizations and management, Role of design staff and supporting managerial staff; Personal management.	12L
UNIT-03	Human Values: Morals, Values and Ethics, Integrity, Work Ethics, Service Learning, Civic Virtue, Respect For Others, Living Peacefully, Caring, Sharing, Honesty, Courage, Valuing Time, Co-Operation, Commitment, Self Confidence, Spirituality. Professional Ethics: Senses of 'Professional Ethics', Variety of model issues, types of inquiry, Moral dilemmas, Moral Autonomy, Kohlberg's theory, Gilligan theory, Consensus and controversy, Profession and Professionalism, Professional Ideals And Virtues, Theories About Right Action, Self-Interest, Customs And Religion, Uses Of Ethical Theories.	12L
UNIT-04	GLOBAL ISSUES: Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors - moral leadership. Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the Three Mile Island and Chernobyl case studies.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Develop a good understanding of professional practices employed in design process and construction of projects.		
CO2: Develop a comprehensive understanding of the obligations and responsibilities as a professional to the clients.		
Books and References		
1. Ethic in Engineering by Mark Martin and Roland Schinzinger, Mccgrew hill, 1999		
2. Architects Handbook, A Ready Reckoner by CharanjitS.Shah, 2000		
3. Town Planning by Rangwala, 2001		
4. Handbook on Professional Practice by The Indian Institute of Architects.		
5. Professional Practice by Roshan Namavati, 2004		
6. Estimation, Costing and Valuation (Professional Practice) by Rangwala, 2002		
7. Directory of Architects, List of Architects and Professional documents by Council of Architecture		
8. Professional Practice & Management by Apte V S		

Department of Architecture

Course Name: Building Services-III		
Course Code: AR-425		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To familiarize the students with fundamentals of air conditioning, firefighting and vertical Transport systems building services & their integration with architectural design.		
Unit Number	Course Content	Lectures
UNIT-01	Detailed studies of Natural and Artificial ventilation. Introduction to the concept of Air-conditioning and detailed studies regarding different types of Air-conditioning systems and their working- window, split, Central systems - design of ducts in central HVAC system.	09L
UNIT-02	Importance of Fire and Life safety Fire Prevention- Classification of Buildings Based on Occupancy, Fire Zones, Types of Construction, General Requirements of All Individual Occupancies Life safety- General Exit Requirements, Occupant Load, Egress Components, Compartmentation, Smoke Control	09L
UNIT-03	Introduction to firefighting systems Fire detection & Alarm, Fire sprinklers, Fire extinguishers and Fire Hydrants system, Their system of working and design calculations	09L
UNIT-04	Lifts- Types, Parts, Dimensions and design of lift system in a building Escalators- Types, Parts, Dimensions and design of lift system in a building	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to:		
CO1: Understand the concept of ventilation and Air-conditioning system in a space.		
CO2: Understand how to provide Fire safety in a building.		
CO3: Understand the various types of lifts and escalators.		
Books and References		
1. Heating, Ventilating and Air Conditioning: Analysis and Design, 6th Edition by Faye C. McQuiston, Jerald D. Parker and Jeffrey D. Spitzer, John Wiley & Sons, 2004.		
2. SP 7: 2005 "National Building Code of India"		
3. IS 3534: 1976 "Outline dimensions of electric lifts"		
4. IS1860: 1980 "Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts"		

Department of Architecture

Course Name: Interior Design (Professional Elective-IV)		
Course Code: AR-441		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 4D		Course Credits: 04
Course Objective		
To equip the students with varied aspects of theory and practice of Interior Design, and develop skills to deal with diverse interior spaces.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction: Purpose, scope, objectives and history of Interior Design.	08D
UNIT-02	Principles and Elements of Interior Design: Space making elements like wall, column, partition screen, floor, furniture, interior landscaping etc., their design value, colour theories and schemes, light.	10D
UNIT-03	Interior-Design: Exposure to diverse traditional, folk and contemporary crafts and their role in creating and enhancing interior spaces. Surface treatments, materials and their application techniques.	10D
UNIT-04	Innovative trends and technologies, materials and interior construction, visual merchandising, acoustics and lighting. Interior services, functional importance, bylaws, supervision and fees. Case Studies: Examples of selected interiors.	12D
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the concept and principles of interior design.		
CO2: Apply the methods and techniques of interior designing.		
CO3: Learn the innovative trends and materials for interior design.		
Books and References		
<ol style="list-style-type: none"> 1. Designing Interior Architecture: Concept, Typology, Material, Construction by Birkhauser Verlag AG, 2013 2. Form + Structure: the organization of interior space by Brooker, Graeme, AVA Publishing SA, Switzerland, 2007. 3. Elements of Space Making by Pandya, Yatin, Mapin Publishing Pvt., 2007 		

Department of Architecture

Course Name: Emerging Building Details & Materials (Professional Elective-VII)		
Course Code: AR-442		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 4D		Course Credits: 04
Course Objective		
To familiarize the student with the system of making detailed working drawings required for construction on site.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to methodology of preparing working drawings, Systems of dimensioning, writing specifications, etc. Preparation of various working drawings civil work and services of a building.	16D
UNIT-02	Preparation of Constructional details & Materials used for toilets, modular kitchen, built- in furniture, Shop fronts, display units, counter (shops, Bank, hotel etc.) and other furniture items.	16D
UNIT-03	Introduction to glass as building material; its types, manufacturing process and applications. Exploration of new building materials – (Aerated Concrete blocks, Gypsum Board, Glass, wood wool concrete or plastic composites, Ferro-cement etc.) Emerging trends in advanced building construction.	16D
Course Outcomes		
Upon successful completion of the course, the students will be able to :		
CO1: Understand the various details in a working drawing.		
CO2: Prepare a detailed drawing for various spaces and components.		
CO3: Understand the process of manufacturing of glass and its applications.		
Books and References		
<ol style="list-style-type: none"> 1. Construction Planning and Management by U.K.Shrivastava, Galgotia Publications, 2009. 2. Building drawing with an integrated approach to Built Environment by M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002. 3. Building Construction Drafting and Design by John Molnar, Van Nostrand Reinhold, 1986. 4. Building Construction Details by Hans Banz, Van Nostrand Reinhold Co., 1983. 5. Building Construction by Sushil Kumar, Standard Publishers Distributors, New Delhi, 2006. 		

Department of Architecture

Course Name: Computer Graphics (Professional Elective-IV)		
Course Code: AR-443		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 4D		Course Credits: 04
Course Objective To familiarize the students with latest software in Practice		
Unit Number	Course Content	Lectures
UNIT-01	Introduction and concepts of BIM (Building Information Modeling)	16D
UNIT-02	Introduction and concepts of Adobe Photoshop	16D
UNIT-03	Introduction and concepts of 3D rendering using Revit, Rhino, Grasshopper, V-Ray etc.	16D
Course Outcomes CO1: Detailed understanding of concept of BIM CO2: Detailed understanding of use of latest software in Practice		
Books and References <ol style="list-style-type: none">1. Building Information Modeling For Dummies, Stefan Mordue, Paul Swaddle, David Philp, For Dummies; 1st edition (30 October 2015)2. Adobe Photoshop 2020 for Photographers: 2020 Edition, Martin Evening, Routledge; 1st edition (4 January 2021)3. Revit Essentials for Architecture: 2021 and beyond (Aubin Academy), Paul F Aubin, G3b Press; 2021st ed. edition (26 August 2020)4. Landscape Performance Modeling Using Rhino and Grasshopper, by Phillip Zawarus, Taylor & Francis Ltd; 1st edition (13 December 2022)		

Course Structure and Syllabi

For

Bachelors Programmes

(B.Arch.)

Fifth Year



राष्ट्रीय प्रौद्योगिकी संस्थान हमीरपुर

National Institute of Technology Hamirpur

Hamirpur - 177 005 (India)

<http://www.nith.ac.in>

July, 2023 Onwards

Fifth Year

9 th Semester									10 th Semester							
SN	Code	Subject	L	T	P	D	Credits	SN	Code	Subject	L	T	P	D	Credits	
1	AR-511	Office Training	-	-	-	-	22	1	AR-521	Architectural Design Thesis	0	0	0	15	15	
2	AR-512	Dissertation	-	-	-	-	4	2	AR-522	Research Methodology	3	1	0	0	4	
									3	AR-523	Project Management	3	1	0	0	4
									4	DET	Professional Elective-VIII	3	1	0	0	4
									5	AR-528	General Proficiency	-	-	-	-	1
Total			Hours =		0	26	Total				Hours =		27	28		

Department of Architecture

Course Name: Office Training		
Course Code: AR-511		
Course Type: Professional Ability Enhancement Compulsory Course (PAECC)		
Contact Hours/Week: -		Course Credits: 22
Course Objective		
To make students learn the intricacies of the Architectural Profession by joining and working with practicing Architects/Architectural firms for one complete semester.		
WORK TO BE DONE	Course Content	Lectures
DURING OFFICE HOURS	The work to be done during office hours will include: Drafting, Tracing, Sketch designs, Presentation drawing, Perspectives, Models, documentation etc. Working Drawing and details. Preparing a study report on Building design, Analysis incorporating Site visits, recording Observations etc.	-
NOTES	The Winter break & entire Even semester will be used for Office Training, which is to be undertaken with an architect registered by the Council of Architecture India having minimum 5 years of practical experience The minimum period of training should be 18-20 weeks. Students can also pursue for training outside the Country, under any Architect whose degree is approved by Architect Act 1972 under Schedule (11) Section-14. Viva Voce(*) will be conducted as per the Academic Calendar, which will consist of the report and the work done by the trainee as per the guidelines & marks will be awarded as per the scheme given above. Trainees are required to submit monthly log book duly signed by the employer and his assessment at the end of training period to the Training & Placement Officer. These reports will be assessed by the Training & placement Officer.	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Learn from firsthand experience of work done by professionals and industry experts.		
CO2: Experience and gain Knowledge of changing industrial needs.		
CO3: Develop better group working abilities.		

Course Name: Dissertation		
Course Code: AR-512		
Course Type: Skill Enhancement Course (SEC)		
Contact Hours/Week: -		Course Credits: 04
Course Objective		
To make the students equip in and Data Collection, Analysis and Research of Architecture and Planning, Urban and Rural development and Socio-Economic conditions		
WORK TO BE DONE	Course Content	Lectures
UNIT – I	Scope for Design/ Research Dissertation: <ul style="list-style-type: none"> • Topics / projects related to architecture and Planning • Rural and Urban redevelopment projects • Landscape projects 	-
NOTES	<p>The subject will be a self-study course which will be completed by student along with Office Training. Students are required to submit their thesis topics to Dissertation coordinator during end term examination of previous semester. Dissertation topics shall be approved by the department separately for each student in the end of previous semester and supervisors will be allocated to each such student from among the faculty.</p> <p>Projects may be based on ongoing, proposed development or new investigation in the related area. Students are required to stay for a week for discussion on thesis topics and guide (External / Internal)</p> <p>Students are required to proceed for Case studies and Data collection of their respective approved Thesis topic in consultation with their supervisor. This work has to be completed by the students in the summer break/ during office training period.</p> <p>A presentation and a report will be presented to the evaluation committee at the end of the semester. Contents of report – Introduction, Literature study and case study, Analysis and Inferences, Conclusion</p>	
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Learn from literature and case studies about the works done by professionals and industry experts.		
CO2: Understand data collection and analysis of data		
CO3: Develop necessary skill of technical report writing.		

Department of Architecture

Course Name: Architectural Design Thesis		
Course Code: AR-521		
Course Type: Professional Core (PC)		
Contact Hours/Week: 15D		Course Credits: 15
Course Objective		
To make student synthesize and use knowledge of various disciplines gained during entire study in an architectural project of their choice.		
STAGES	Course Content	Lectures
STAGE-01	Case Studies, Data Analysis, Library study, tentative space requirement, Concept, Pre-Final design proposal and Block Model.	-
STAGE-02	Detailed working drawings showing any two of the following services: Air-conditioning, Landscape, Structure, Interior detailing, Water supply & Sanitation or any other detail. Hard Bound report. Final design proposal along with model/views.	-
NOTE	Synopsis (Introduction, Validity, Aims & Objective, Methodology, Site details) to be submitted in the last month of the previous semester for the finalization of topic and Supervisor. Stage-01 will be evaluated during mid semester. Stage-02 will be evaluated in the end semester.	
Course Outcomes		
Upon successful completion of thesis, the students will be able to		
CO1: Improve upon their creative and technical skills.		
CO2: Understand user and project requirements.		
CO3: Develop a good understanding of building services and its integration into the design.		

Department of Architecture

Course Name: Research Methodology		
Course Code: AR- 522		
Course Type: Professional Ability Enhancement Compulsory Course (PAECC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To appreciate the process of research and make the students aware of its potential in the field of architecture.		
Unit Number	Course Content	Lectures
UNIT-01	Research in architecture – its nature, purpose and scope. Basic and applied research. Technical and behavioural – oriented research.	09L
UNIT-02	Science and scientific method – various steps in scientific method: hypothesis, research design, data collection & analysis, conclusion and implications with special reference to architectural research.	09L
UNIT-03	Methods of conducting research. Selection of topics and its relevance. Identification and formulation of problem. Compiling and analysing existing research database.	09L
UNIT-04	Research design, research instruments and analysis. Presentation of results. Evaluation of findings, conclusions and recommendations. Techniques of research – report writing.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the importance of research in architecture.		
CO2: Learn the methodology followed in research.		
Books and References		
1. Research : How to Plan, Speak and Write about it by C. Hawkins & M. Sorgi, Springer-Verlag, 1985		
2. Research Methodology by Rajagopalan, Mathews and Ramamurthy		
3. Groat, Linda N. and Wang, David C. 2002. Architectural Research Methods. New York: John Wiley.		
4. Day R.A., (1991) "How to Write and Publish a Scientific Paper", Cambridge University Press,R.K.		
5. Krishnaswami, O.R. (1993). Methodology of Research in Social Sciences. Himalaya Publishing House. Bombay.		
6. Creswell John. W. (1994). Research Design – Qualitative and Quantitative Approaches. SAGE Publications		
7. Thakur, N. (1998). "Building Knowledge through a Holistic Approach towards Architectural Education and Research". Proceedings of the seminar on Architecture and Interdisciplinary.		
8. Kothari C.R. (2004). Research Methodology- Methods and Techniques, New Age International (P) Ltd, Publishers, New Delhi		
9. Till, Jeremy. (2007), Architectural research: Three myths and one model, RIBA,UK		
10. Dve, Anne (ed.), (2014), How Architects use research- Case studies from practice, RIBA,UK		
11. Frayling, Christopher. (1993), "Research in Art and Design", Royal College of Art Research Papers.		

Department of Architecture

Course Name: Project Management		
Course Code: AR- 523		
Course Type: Professional Ability Enhancement Compulsory Course (PAECC)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To let the students understand the onsite problems related to building construction and causes of delay in construction, as well as to inculcate the skills as a team manager.		
Unit Number	Course Content	Lectures
UNIT-01	Aim, objectives and functions of Construction Management. Construction stages, Construction team Role of an architect in construction management. Management techniques and tools.	09L
UNIT-02	Bar charts and limitations of bar charts. Program Evaluation and Review Techniques (PERT). Critical Path Method (CPM) for project management.	09L
UNIT-03	Development and analysis of CPM net work. Cost time analysis in network planning. Scientific methods of construction management.	09L
UNIT-04	Project management for repetitive types of buildings. Line of balance method – its working knowledge with exercises. Resource scheduling methods through Bar charts, CPM and Line of Balance method. Inspection and quality control. Safety in Construction.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Learn the techniques of project management.		
CO2: Understand the role of an architect in construction management.		
CO3: Understand the safety measure to be followed in construction.		
Books and References		
1. Construction Planning and Management by U.K.Shrivastava		
2. Total Construction Project Management by George J Ritz		
3. Robert Peurifoy, Clifford J. Schexnayder Construction Planning, Equipment and Methods, Mc GrawHill		
4. Callaghan, M.T, Quackenbush, D.G. and Rowings-, J.E, 'Construction Project Scheduling', McGraw-Hill		
5. Robert B. Harris-, 'Precedence and Arrow Network Techniques for Construction		
6. Stevens James D, 'Techniques or Construction Network Scheduling'		
7. Bhattacharjee S.K-, 'Fundamentals of PERT/CPM and Project Management'		
8. N. P. Vohra- 'Quantitative Techniques in Management'		
9. Construction Project management by Eddy M Rojas		
10. Project Planning and Control with PERT and CPM by Dr. B C Punmia, K. K Khandelwal		

Department of Architecture

Course Name: Building Economics & Sociology (Professional Elective-VIII)		
Course Code: AR-541		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objectives		
To create awareness among the students regarding management of physical and human resources pertaining to a business organization in general and specific to construction industry.		
Unit Number	Course Content	Lectures
UNIT-01	Nature Of Economics: Introduction, Evolution of Economics, Definition – wealth, welfare, scarcity, Nature and scope of economics, Division of economics, Economics in relation to engineering and other Social Sciences Demand and Law Of Demand: Meaning of demand, Kinds of demand, Law of demand, Demand schedule and curve, Limitations of law of demand, Shape of demand curve, Extension Contraction Increase and decrease in demand, Factors affecting demand, Goods and kinds of goods.	09L
UNIT-02	Elasticity of Demand: Meaning of elasticity of demand, Degree of elasticity of demand, Types of elasticity of demand, Factors governing elasticity of demand, Importance of elasticity of demand Laws Of Consumption: Consumption, Forms of Consumption, Importance of utility, Law of diminishing marginal utility, Law of equi-marginal utility. Scale of production: Supply, Laws of supply, General equilibrium Large scale production its advantages and disadvantages, Small scale production its advantages and disadvantages.	09L
UNIT-03	Economics Related To Building Construction Industry And Real Estate: Need for economic tools, Concept of Economic efficiency, Economic analysis process, Construction Industry, Nature of construction industry in India, Problems of changes in demand (Sellers' market to Buyers' market), Existing scenario of construction industry/Real estate and Land market in the metro cities of India, Influence of the Government policies on the land Market and the Construction Industry, Methods of controlling the inadequacies in construction industry/real estate.	09L
UNIT-04	Indian social structure: Introduction – Varied religion/cultures –varied languages — Rural Urban conflict The Indian Village: Introduction – Village types according to their structure —Village forms With respect to Order/Cluster – Caste Hierarchy -Caste and Habitation area in a village – Social structure of a village community – Planning of a typical village house The Indian City: Introduction – Emergence of small family pattern -Urban and Suburban life – Disintegration of Joint family –Emergence of Urban societies City life style – Characteristics Of urban population – Social Psychology of urban life – Varied life styles – Planning of a typical urban dwelling	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the different concepts and evolution of economics with respect to construction industry.		
CO2: Learn the concept of demand and supply		
CO3: Identify the importance of Social Psychology.		
CO4: Learn how various types of hierarchies affect a village form.		
CO5: Understand the emergence of urban societies.		
Books and References		
1. Modern Economic Theory by K.K. Dewett and K.K. Bahl, S Chand; Reprint Edition, 2006.		
2. Economics for Engineers by M.L. Gupta, Abhishek Publications, 2000.		
3. Microeconomic Theory by Larry Samuelson, Springer Science & Business Media, 1986.		
4. Rural Sociology in India by A.R.Desai, Popular Prakashan Ltd.; New edition, 2011.		
5. The Urban World by J. John Palen, Oxford University Press; 9thedition, 2011.		
6. Models of Urban and Regional Systems in Developing Countries by George F. Chadwick, Pergamon Press, 1987.		

Department of Architecture

Course Name: Housing (Professional Elective-VIII)		
Course Code: AR-542		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To equip students to deal with housing, along with the related issues of existing Housing stock and its future requirement.		
Unit Number	Course Content	Lectures
UNIT-01	Introduction to housing & human settlements, Housing policies and programs, settlements in the development of human civilization, role of Housing in social and economic development of the nation. Housing in five-year plans & Social Housing plans. National housing Policy	09L
UNIT-02	Major elements of housing policy: land, finance, material, technology & legislation. Development concepts and human settlement planning. Slum area development.	09L
UNIT-03	Housing design & standards, units of housing design form and structure of housing as shaped by Socio-economic and physical parameters, housing systems & sub systems.	09L
UNIT-04	Partial and integrated environment quality; post occupancy evaluation, housing Satisfaction, housing demand and policy analysis.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand theories of human settlement.		
CO2: Learn the government policies and programs on Hosing development.		
CO3: Apply the methods of housing planning.		
Books and References		
<ol style="list-style-type: none"> 1. Developing Affordable Housing: A Practical Guide for Nonprofit Organizations by Bennett L. Hecht (1990), Wiley Nonprofit Law, Finance and Management Series 2. The Housing Boom and Bust by Thomas Sowell (2009) 3. The Architecture of Affordable Housing by Sam Davis (1995) 4. Housing and Dwelling: Perspectives on Modern Domestic Architecture by Barbara Miller Lane (2009) 5. Affordable Housing and Public Policy: Strategies for Metropolitan Chicago (Assembly Book) by Lawrence B. Joseph (Editor) 6. K. Thomas Poulouse- 'Innovative Approaches to Housing for the poor' 7. Reading Material in Housing -Compiled by K. Thomas Poulouse for ITPI students 8. Shadow cities by RobertNeuwirth 9. The modern economics of Housing by RandallJohnston 10. Planning sustainable cities-UNHabitat 		

Department of Architecture

Course Name: Urban Planning (Professional Elective-VIII)		
Course Code: AR-543		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To make the student aware of basic principles and concepts of Town/urban planning. Evolution of Human Settlements and Urban Forms. Study the evolution of Historical and Modern Context in Urban Planning		
Unit Number	Course Content	Lectures
UNIT-01	Introduction, Role, Importance and Scope of Town Planning. Planning Principals of Human Settlement in Nile Valley, Greek and Roman Periods. tc.	09L
UNIT-02	Town Planning in India- Vedic period, Indus Valley, Islamic, Medieval and Colonial Period. Classification of Human Settlements based on Road Pattern, Form, Use, Scale/ Population e	09L
UNIT-03	Master Plan – Objectives, Role, Importance and Methodology, Regional Plan - Objectives, Role, Importance and Methodology Zoning & land use, neighborhood planning, site planning, survey techniques, urban traffic, urban renewal & redevelopment, present day planning in India.	09L
UNIT-04	Role of Development Authorities in Urban Development Survey of existing neighborhood, community, Study of existing development plans at city level, Planning of small units like neighborhood, townships, etc.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO1: Understand the concept of planning and learn about the prominent theories and works in the field		
CO2: Understand the technicalities and working in the planning field with zoning regulations and survey techniques		
CO3: Visit and survey the existing developments at neighborhood level with data collection techniques		
Books and References		
1. URDPFI Guidelines and NBC 2016 Code		
2. The Urban Pattern-City Planning & Design – Arthur B. Gallion & Simon Eisner		
3. Urban Architecture (City Planning) – Arco Colour series		
4. Ancient Cities-Sacred Skies – Malville & Gujaral		
5. Town Planning – Rangwala		
6. Kevin Lynch, 'The Image of the City' MIT Press, 1960.		
7. 'Urban Design Reader', 2006, Mathew Carmona and SteveTiesdell.		
8. Gordon Cullen, 'The Concise Townscape', The Architectural Press, 1978.		
9. Edmund Bacon, 'Design of Cities', Penguin, 1976.		
10. A.E.J. Morris, 'History of Urban Form before the Industrial Revolution', Prentice Hall, 1996.		

Department of Architecture

Course Name: Architectural Conservation (Professional Elective-VIII)		
Course Code: AR-544		
Course Type: Professional Elective (PE)		
Contact Hours/Week: 3L + 1T		Course Credits: 04
Course Objective		
To equip students to deal with Architecture conservation, along with the related design issues of existing Architecture, old Monuments, and natural and urban heritage areas.		
Unit Number	Course Content	Lectures
UNIT-01	Interactive session of History of heritage Buildings and cities. Introduction to conservation of Historic Buildings. The concepts and approaches to conservation in India and other countries.	09L
UNIT-02	Institutional Aspects of Conservation, Conservation related Charters, World Heritage legislation. Conservation Acts & Legislation and Archaeological Acts	09L
UNIT-03	Conservation Area practice, Adaptive reuse, Upgradation programs in old areas, Infill design and Conservation of traditional water systems.	09L
UNIT-04	Upgrading infrastructure, financing and implementation framework for redevelopment and revitalization projects.	09L
Course Outcomes		
Upon successful completion of the course, the students will be able to		
CO4: Learn the history of heritage buildings.		
CO5: Understand the legislations and acts on Conservation.		
CO6: Understand the Conservation related Charters		
CO7: Understand the methods of conservation of heritage buildings and sites.		
Books and References		
1. Architecture in Conservation: Managing Development at Historic Sites (Heritage: Care Preservation-Management) by James Strike		
2. Protection, Conservation and Preservation of Indian Monuments by Shanti Lal Nagar		
3. Architectural and urban conservation by Santosh Ghosh, Ranajit Gupta, and Sumita Gupta		
4. History of Architectural Conservation by Jukka Jokilehto		

PROFESSIONAL ELECTIVE LIST

Elective I (5th Semester)						
Code	Subject	L	T	P	D	Credits
AR-331	Sustainable Vernacular Practices in Himachal Pradesh	3	1	0	0	4
AR-332	Environmental Studies	3	1	0	0	4
AR-333	Art and Architecture	3	1	0	0	4
Elective II (5th Semester)						
Code	Subject	L	T	P	D	Credits
AR-351	Barrier Free Architecture	3	1	0	0	4
AR-352	Society and Built Environment	3	1	0	0	4
AR-353	Healthcare Architecture	3	1	0	0	4
Elective III (6th Semester)						
Code	Subject	L	T	P	D	Credits
AR- 341	Architectural Journalism	3	1	0	0	4
AR- 342	Structural Systems in Architecture	3	1	0	0	4
AR- 343	Sustainable Settlement Pattern for Climate Resilience	3	1	0	0	4
Elective IV (6th Semester)						
Code	Subject	L	T	P	D	Credits
AR- 361	Building Regulations	3	1	0	0	4
AR- 362	Behavioural Architecture	3	1	0	0	4
AR- 363	Applications of GIS in Architecture and Planning	3	1	0	0	4
Elective V (7th Semester)						
Code	Subject	L	T	P	D	Credits
AR-431	Building Maintenance	3	1	0	0	4
AR-432	Futuristic Architecture & Tall Buildings	3	1	0	0	4
AR-433	Industrial Architecture	3	1	0	0	4
Elective VI (7th Semester)						
Code	Subject	L	T	P	D	Credits
AR-451	Low-Cost Buildings	3	1	0	0	4
AR-452	Building Automation and Services Management	3	1	0	0	4
AR-453	Theory of Design	3	1	0	0	4
Elective VII (8th Semester)						
Code	Subject	L	T	P	D	Credits
AR-441	Interior Design	0	0	0	4	4
AR-442	Emerging Building Details and Materials	0	0	0	4	4
AR-443	Computer Graphics	0	0	0	4	4
Elective VIII (10th Semester)						
Code	Subject	L	T	P	D	Credits
AR-541	Building Economics and Sociology	3	1	0	0	4
AR-542	Housing	3	1	0	0	4
AR-543	Urban Planning	3	1	0	0	4
AR-544	Architectural Conservation	3	1	0	0	4