

BACHELOR OF ARCHITECTURE PROGRAMME

AT

**NED UNIVERSITY OF ENGINEERING
AND TECHNOLOGY, KARACHI**

REVISED COURSES OF STUDIES

Detailed Syllabi

Semester System

(2014 Onwards)

**DEPARTMENT OF ARCHITECTURE AND PLANNING
NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY
CITY CAMPUS, MAULANA DIN MOHAMMAD WAFAI ROAD
KARACHI-74200.**

FIRST YEAR ARCHITECTURE									
Spring Semester					Fall Semester				
Course Code	Course Title	Credit Hours			Course Code	Course Title	Credit Hours		
		Th	Pr	Total			Th	Pr	Total
AR 101	Basic Design-I	1	3	4	AR 102	Basic Design-II	1	3	4
AR 121	Introduction to Environmental Studies	2	1	3	AR 111	Introduction to History, Theory and Culture	2	1	3
AR 141	Communications and Skills-I	0	3	3	AR 142	Communication and Skills-II	0	3	3
HS 101	English	3	0	3	AR 151	Construction and Materials-I	1	2	3
MT 112	Mathematics for Architects	3	0	3	CE 102	Statics and Dynamics	3	1	4
PH 111	Basic Physics for Architects	1	1	2	HS 105	Pakistan Studies OR	2	0	2
CY 111	Basic Chemistry for Architects	1	1	2	HS 127	Pakistan Studies (for Foreigners)			
Total		11	9	20	Total		9	10	19

SECOND YEAR ARCHITECTURE									
Spring Semester					Fall Semester				
Course Code	Course Title	Credit Hours			Course Code	Course Title	Credit Hours		
		Th	Pr	Total			Th	Pr	Total
AR 201	Architectural Design-I	1	4	5	AR 202	Architectural Design-II	1	4	5
AR 211	History and Theory-I	2	1	3	AR 212	History and Theory-II	2	1	3
AR 241	Communication and Skills-III	0	3	3	AR 221	Development Studies	2	1	3
AR 251	Construction and Materials-II	1	2	3	AR 231	Environmental Design and Systems-I	2	1	3
CE 103	Surveying-I	3	1	4	AR 242	Communication and Skills-IV	0	3	3
HS 205	Islamic Studies OR	2	0	2	CE 251	Structure for Architects-I	3	0	3
HS 209	Ethical Behaviour (for Non-Muslim)								
Total		9	11	20	Total		10	10	20

THIRD YEAR ARCHITECTURE									
Spring Semester					Fall Semester				
Course Code	Course Title	Credit Hours			Course Code	Course Title	Credit Hours		
		Th	Pr	Total			Th	Pr	Total
AR 302	Architectural Design-III	1	5	6	AR 302	Architectural Design-IV	1	5	6
AR 311	History and Theory-III	2	1	3	AR 312	History and Theory-IV	2	1	3
AR 331	Environmental Design and Systems-II	2	1	3	AR 321	Housing and Community Development	2	1	3
AR 351	Construction and Materials-III	1	2	3	AR 341	Communication and Skills-V	1	2	3
AR 361	Introduction to Architectural Conservation	2	1	3	AR 352	Construction and Materials-IV	1	2	3
AR 381	Introduction to Landscape Architecture	1	2	3	CE 351	Structure for Architects-II	3	0	3
Total		9	12	21	Total		10	11	21

FOURTH YEAR ARCHITECTURE									
Spring Semester					Fall Semester				
Course Code	Course Title	Credit Hours			Course Code	Course Title	Credit Hours		
		Th	Pr	Total			Th	Pr	Total
AR 401	Architectural Design-V	1	5	6	AR 402	Architectural Design-VI	1	5	6
AR 403	Introduction to Interior Design	1	2	3	AR 421	Urban Planning and Design	2	1	3
AR 411	History and Theory-V	2	1	3	AR 431	Environmental Design and Systems-III	2	1	3
AR 441	Communication and Skills-VI	1	2	3	AR 461	Research Methodologies	2	1	3
AR 451	Construction and Materials-V	1	2	3	CE 451	Structure for Architects-III	3	0	3
Total		6	12	18	Total		10	8	18

FINAL YEAR ARCHITECTURE									
Spring Semester					Fall Semester				
Course Code	Course Title	Credit Hours			Course Code	Course Title	Credit Hours		
		Th	Pr	Total			Th	Pr	Total
AR 501	Architectural Design Project*	-	-	-	AR 501	Architectural Design Project	2	12	14
AR 521	Comprehensive Environmental Design	0	6	6	AR 561	Professional Practice	2	1	3
AR 552	Construction and Materials-VI	2	1	3					
Total		2	7	9	Total		4	13	17

*Duration one academic year: required literature survey and preliminary work will be done during this semester.

FIRST YEAR ARCHITECTURE
SPRING SEMESTER

AR 101
Basic Design-I

Principles of Design: Recognition and understanding of the basic principles and tools of design (such as line, form, shape, pattern, texture, volume, spaces, etc); introduction to the principles of composition in two dimension, using varying mediums and exercises; concepts in design organization (such as symmetry, balance, hierarchy, repetition, dominance, solids and voids, etc.).

Studio Exercises: Two dimensional compositions using varying exercises (for e.g. geometrical patterns and their transformations etc.), application of multiple mediums and adding taglines/titles to compositions.

AR 121
Introduction to Environmental Studies

Concepts and Terminology: Definitions and concepts of natural and built environment; components of physical and non-physical aspects of the environment; sociology, art, culture and their relationship with the built environment; economy and politics and their role in the environment; technological advancements and society; actors and factors; indicators and variables of the built environment; issues of the built environment; introduction to the concept of a sustainable environment; Karachi's history and the city's context.

Components of the Physical Environment: Land use, transportation, community infrastructure, service infrastructure, topography, natural features, geography, location, topography, technology, etc.

Introduction to Tools for Recording and Observation of Macro Environment: Sketches, photography, maps, social surveys, interviews, and other techniques in quick and detailed documentation of urban and rural environments.

Environmental Profile of Pakistan - An Introduction: Geographical distribution; social profiles; resources; major issues of environment (deforestation/forest degradation, water logging and salinity, erosion/sedimentation, desertification, species extinction, urbanization, etc); key issues in Pakistani environment (water management, aquatic eco-system, tourism, health, food, tourism and energy related issues, etc.).

Karachi – A Profile: Basic facts (related to growth, population, economy and urban geography, etc.); history and development; dominant environmental issues (including housing, transport, water supply, sewerage, solid waste management, law and order, etc.); state response to issues.

Case Studies: Evolution and issues of cities/settlements of the world.

AR 141
Communication and Skills-I

Free Hand Drawing and Sketching: Exercises including free hand drawing / sketching of real life objects, quick 3D sketching using pencil, pen, charcoal, water colors, markers, pointers etc. Rendering, calligraphy (typology), sciagraphy; introduction to sculpture and techniques in casting, carving, moulding with various materials like fibre glass, clay, etc.

Technical and Analytical Drawings: Concept of scaled drawings by using different drafting tools and techniques through various exercises. Use of line weights, linetypes, plain geometry, basic solids, orthographic projections, and understanding of sections through various assignments.

Model Making and Material Exploration: Introduction to workshop environment with its tools, equipments and model making materials. Scales in model making, and tool application through various exercises.

HS 101 **English**

Report Writing: Technical report writing.

Speeches: Preparation of short speeches for various occasions.

Written Communication: Writing of formal letters and applications; drafting of memoranda, contracts, advertisements and tender notices; preparation of minutes of the meeting; writing short papers on technical subjects; note taking.

Oral Communication: Oral reporting; conference leading; dictation; interviewing.

Précis Writing: Précis writing.

Essays: Writing essays on technical and non-technical subjects.

Applied Grammar: General rules for writing correct English; punctuation; study of words (morphology); construction and improvement of sentences; vocabulary building and use of dictionary.

MT 112 **Mathematics for Architects**

Sets and Functions: Definition of set, set operation. relations, functions, graph of functions; trigonometric functions and their applications.

Differential and Integral Calculus: Limits of functions, continuity of function; derivative of function; Leibniz theorem; extreme value of functions partial differentiation, curvature and radius of curvature of a curve, techniques of integration; definite and indefinite integrals; reduction formulae; beta and gamma functions with applications (arc length, area, volume, centeroid, inertia); ordinary differential equation.

Solid Geometry: Coordinate systems in three dimensions; direction cosines and ratios; vector equation of straight line, plane and sphere, surface of revolutions; transformation (Cartesian, polar and cylindrical).

Matrices and Determinants: Definition of matrix, determinant of matrix; types of matrix, elementary row operation; echelon and reduced echelon forms; rank of a matrices; determination of consistency of a system of linear equations; application in related problems.

Statistics and Probability: Types of data, presentation of data, objects, classifications; tabulation, frequency distribution, graphical representation; simple and multiple bar diagrams, sector and pie-diagram, histogram, frequency polygon; frequency curves and their types, measure of central tendency, measure of dispersions, moments; skewness and kurtosis; basic concepts of permutation and combination; definitions of probability; laws of probability with application.

PH 111

Basic Physics for Architects

Sound: Wave motion, simple harmonic motion, longitudinal waves; inverse square law of sound, reverberation, seismic waves, transverse waves stationary waves, forced and free vibrations, resonance and beats.

Light: Nature of light, superposition of waves, reflection, refraction, Huygens's principle, interference, interferometer, dispersion, prism, biprism, diffraction, diffraction grating, polarization, illuminance, spectrophotometry, electric light source; conditions for good illumination.

Modern Physics: Inadequacy of classical physics. Planck's explanation of black body radiation, photoelectric effect; Compton effect, Bohr theory of hydrogen atom, atomic spectrum, reduced mass, de-Broglie hypothesis, Bragg's Law, electron microscope, atomic nucleus, mass energy relation, binding energy, nuclear forces, nuclear radiation hazards and safety; medical uses of nuclear radiation; fission; energy release; nuclear reactors, breeder reactors, nuclear fusion.

CY 111

Basic Chemistry for Architects

Basic Chemistry: Definitions; the expression of concentration; Ions; molecules and bonding; balancing reactions; oxidation reduction reactions; equilibrium; conductivity and Ionic strength chemical kinetics; gas laws; gas solubility (Henry's law); solubility product complexes; nuclear chemistry.

Organic and Biochemistry: Carbon, properties of organic compounds, functional groups, aliphatic compounds, nitrogen containing compounds, compounds of sulfur, naturally occurring organic compounds, Glycolysis, Tricarboxylic Acid Cycle, enzyme kinetics.

Chemistry of Engineering Materials: Cement, concrete, additives, asphalts, fiber (geo fiber), glass fiber, rubbers, plastics, paints, steel and other metal (Al, Cu, etc), polymers.

Corrosion: Theories, inhibition and protection of engineering materials.

FALL SEMESTER

AR 102

Basic Design-II

Principles of Design: Primary elements of design and principles of composition are explored in 3D using platonic forms, regular and irregular forms. Exploration of compositions in terms of spatial/architectural elements (planes, geometry, proportions and ordering principles) Introduction of ordering elements (axis, grid, symmetry, hierarchy, rhythm and repetition) with reference to scale and proportioning systems.

Studio Exercises: Asymmetrical arrangements of platonic forms at varying scales, using model making as an important tool for investigation of balanced compositions. Manipulation of forms applying addition, subtraction, intersection, transparency, opaqueness, translucency and skewing. Introducing function to forms, anthropometrics and scale.

AR 111

Introduction to History, Theory and Culture

Introduction to History and Roles of Art and Architecture: What is history? Chronology and chronological systems. Dating systems. Historical structures of West and East. What is Art? What is Architecture? Art as record, expression, imitation, creation. Concepts of beauty/decoration, aesthetics, cultural values etc.

Geography, Culture and Contextual Studies: Understanding of earth and geography, contextual relevance and interpretation of art and architecture. Life in cities. Skill building in map reading and vocabulary.

Introduction to Historical Periods and Visual Historical Survey: Overview of historical periods of east and west. Survey of key built monuments and art works from all periods of history and their inter-relationships of historical periods and influences.

Introduction to main ideas of the age through local impact; Modernism, Post-Modernism, Feminism, Darwinism, Romanticism and some key thinkers. Movements of Colonization, Orientalism, Globalization etc. Muslim and Eastern theories and responses; Reformists, Progressives and Traditionalist movements.

Introduction to Sociology and Psychology: Basic concepts and theories in sociology and psychology. Psychological perspectives on Man: Introspection, Freudian, Psychoanalysis, Jungian, Behaviorism, Humanism, Gestalt, Environmental psychology and social spaces.

Introduction to Philosophy and Critical Theory: Introduction to key philosophers and thinkers from East and West.

AR 142

Communication and Skills-II

Freehand Drawing and Sketching: Exercises designed to enhance the skills of freehand sketching/drawing of buildings and other architectural elements in various mediums for both exteriors and interiors. These exercises include freehand drawing/sketching, quick 3D sketching, rendering, photography, clay and fiberglass modelling, etc.

Technical and Analytical Drawings: Understanding of shades and shadows, perspectives (one point, two point) and presentation drawings developed through various exercises by using different mediums like pencils, rapidograph etc. (for e.s. presentation drawings of interior and exterior of residences).

Model Making: Techniques for basic architectural models.

Architectural Process Drawings: Introduction, meaning, application and techniques of process drawings.

Design of Architectural presentation: Techniques of architectural presentations. Psychological aspects of presentation schemes, data-transfer, attraction points, climax/anti-climax, retaining attentiveness of viewers, types of strategies (serial, holistic, corporate-image, informal, formal etc.).

AR 151

Construction and Materials-I

Terminology and Nomenclature of Basic Building Components: Terminology and nomenclature of basic components of a building; such as walls, floors, roofs, doors, windows, staircases, arches etc.

Introduction to Basic Building Materials and its Chemical Compositions: Various types, origin, availability and usage of basic building materials such as rocks, soil, stone, timber, bricks, blocks, lime, mud, cement, sand, aggregate etc.

Communication in Construction through Visuals: Photography and documentation of building components such as walls, floors, roofs, doors, windows, staircases, arches etc.

Communication in Construction via Scaled Drawings: Brick/block masonry bonds and details of joints at various angles in between two walls.

Basic joinery details in wood, aluminium and steel. Plans, elevations, sections and details of various types (operational) of wooden and aluminium doors and windows. Plans, elevations, sections and details of wooden and RCC dog-legged staircase.

Site Visits to Construction Sites: Students shall be taken to various under-construction sites to observe methods of wall construction, installation of doors and windows and other construction processes.

CE 102

Statics and Dynamics

Statics of Particles: Forces in a plane; Newton's first law; free body diagram; forces in space (rectangular components); equilibrium of a particle in space.

Kinematics of Particles: Rectilinear and curvilinear motion of particles; components of velocity and acceleration, motion relative to a frame in translation.

Kinetics of Particles: Newton's second law; dynamic equilibrium; rectilinear and curvilinear motion; work and energy; kinetic energy of a particle; principle of work and energy; conservation of energy; impulse and momentum; impulsive forces and conservation of momentum; impact; direct and oblique; conservation of angular momentum.

Rigid Bodies: Equivalent systems of forces, principle of transmissibility, moment of a force; couple; varignon's theorem; centre of gravity of a three dimensional body and centroid of a volume; moments of inertia; radius of gyration; parallel axis theorem.

Equilibrium of Rigid Bodies: Free-body diagram; equilibrium in two and three dimensions; reaction at supports and connections; equilibrium of two-force and three-force bodies.

Kinematics of Rigid Bodies: General plane motion; absolute and relative velocity and acceleration.

Plane Motion of Rigid Bodies: Forces and acceleration; energy and momentum; conservation of linear and angular momentum.

Friction: Basic principles relating to friction between solid bodies; friction angle; wedges.

Analysis of Structures: Internal forces and Newton's third law; planar and space trusses, methods of joints and sections; forces in cables; introduction of shear force and bending moment in simply supported beams and cantilever beams.

HS 105

Pakistan Studies

An Outline of Emergence of Pakistan: A brief historical survey of Muslim community in the sub-continent; War of Independence 1857 and aftermath. Sir Syed Ahmed Khan; Development of Two Nation Theory; Formation of Muslim League; Lucknow Pact; Khilafat and Non-Cooperation Movement; Political Events from 1924 to 1937; Pakistan Resolution; Struggle for Pakistan from 1940 to 1947; Emergence of Pakistan.

Land of Pakistan: Geophysical conditions; territorial situation and its importance; natural resources – mineral and water.

Constitutional Process: Early efforts to formulate constitution; problems and issues; constitution of 1956 and its abrogation; the constitution of 1962 and its annulment; constitutional and political crisis of 1971; the constitution of 1973; recent constitutional developments.

Post-Independence Developments: Education in Pakistan, planning and development in the field of education; development of science and technology with special reference to engineering and architecture; brief survey of Pakistan economy, industrial and agricultural development; internal and external trade; economic planning and prospects; cultural development in Pakistan; definition, contents and contributing factors in culture; development of art, philosophy and literature.

Foreign Policy: Relations with neighbours, super powers and the Muslim world.

SECOND YEAR ARCHITECTURE

SPRING SEMESTER

AR 201

Architectural Design-I

The aim of second year studio is to develop an architectural design vocabulary, and inculcate an individual approach to architecture design. The design studio is supported by lectures, drawings, readings, and site visits.

Design principles and process: Introduction to Architectural Design Vocabulary: Introduction to architectonics with systematic build-up of architectural vocabulary around specified function, context and anthropometric considerations.

Techniques of addition and subtraction of platonic forms, planes and elements of architecture. Introduction of human scale, site considerations, circulation, views and axis. Experience of space through introduction of human scale, site considerations, circulation, view and axis.

AR 211

History and Theory-I

The birth of civilisation, its cultural and religious complexities, the advancement in technology, trade, politics etc. and its impact on the art, literature, architecture and settlement patterns from beginning to classical period in all parts of the world.

Primitive Societies: The pre-writing epoch covering the stone age, the Neolithic age (Catal Huyuk, Jericho etc.), cave art, and the first sculptural works. Developments of the age in Pakistan.

Meso Civilizations: The advent of writing and birth of 'civilization'. The impact of agriculture on the early societies and the shift from stone age to bronze age to iron age. Architecture, art and cities of the river valley civilizations including Mesopotamia, Indus valley, Ancient china, Egypt, etc.

Ancient Greece: Architecture, art and cities from ancient Greece. The cultural and religious complexities, the advancement in technology, trade, politics etc. and its impact on the art, literature and architecture. The use of classical orders in architecture. Art and architecture from Archaic, Classical, Hellenistic, Ionic periods. Introduction to classical philosophy of Homer, Socrates, Plato and Aristotle etc. Cities of Crete, Ionia, Mycenae, etc.

South and Southeast Asia (Before 1200): Architecture, art and cities from South Asia; Review of Early and Meso Settlements in the region, Vedic Period, Maurya Dynasty, Gandhara, Gupta and post-Gupta periods, Medieval period. Art, Architecture and Cities of Southeast Asia including Srilanka, Java, Cambodia etc. Special topics for regions of Pakistan.

AR 241

Communication and Skills-III

Introduction to software related to drafting and design, visualization and rendering.

Introduction to various software packages and their applications in architectural designing. This course is targeted at making the transition from manual design to computer aided design through software, such as AutoCAD, Adobe Photoshop, Sketch-up etc.

AR 251

Construction and Materials-II

Terminology and Processes Nomenclature of Super and Sub Structures: Terminology and nomenclature of basic components of sub and super structure of a building; Excavation, Levelling, Compaction, Lean concrete, Reinforced concrete, Waterproofing, DPC, Plinth, Columns, Beams, Lintels, Slabs, Sunken slabs, Screed, Roof Insulation etc.

Building Materials: Blocks, Bricks, Concrete, Mud, Wood and their Manufacturing Processes: Concrete, Curtain Walls, Fair-face panels.

Communication in Construction via Scaled Drawings: Plans, Elevations, Sections and Details of RCC Foundations, Columns, Beams, Window Sills, Lintels, Projections, Slabs, Sunk Slabs, Roof Slabs (ridges, valleys, water scuppers, water proofing, insulation) etc. Construction details of all parts of sub and super structure combined of a small scale project.

Site Visits: Visits to various under construction sites to observe sub and super structure construction at various stages.

CE 103 Surveying-I

Introduction: Scales, R.F. of scale, conventional signs, principles and objectives of surveying.

Chain Surveying: Different kinds of chains, principles of chain surveying, instruments used in chain surveying, recording of field book and plotting, obstacles in chain surveying, correction of lengths and areas, Computation of area of regular and irregular figures, plane meter.

Compass Surveying: Prismatic compass, its use, whole circle bearing and reduced bearing, Magnetic variation, local attraction, Traversing and plotting, closing error and adjustments.

Plane Table Surveying: Theory and use of simple plane table. Different methods of plane tabling. Two point and three point problems.

Levelling: Theory of levelling, computing R.L. by Collimation methods and rise and fall methods, curvature and refraction, Contours and their uses. Cross-sections and longitudinal sections of land to understand levels, slopes, cutting and filling, mensuration, calculation of areas and volumes for cutting and filling etc.

Theodolite: Use of theodolite in taking horizontal and vertical angles. Interpretation of plans from architectural view point. Layout of buildings and demarcation of sites.

Practicals: To be based on the above studies.

HS 205 Islamic Studies

Nature, Scope and Method of Ethics: Ethics and Religion; Ethical teachings of World Religions.

Basic Moral Concepts: Right and Wrong; Good and Evil.

Ethical Systems in Philosophy: Hedonism, Utilitarianism, Rationalism & Kant; Self-Realisation Theories; Intuitionism.

Islamic Moral Theory: Ethics of Quran and its philosophical basis; Ethical precepts from Quran and Hadith and promotion of moral values in society.

FALL SEMESTER

AR202 Architectural Design-II

Design principles and process: Architecture Design through Conceptual Development: The second semester is an amalgamation of planning and architectonics based on an individually developed design approach to site and functional requirements.

While emphasizing earlier lessons learned in first semester, the students inquire into design briefs and site forces and thereby develop an individual and critical approach to architecture design.

Students explore the process of organization of spaces through tools of zoning, bubble diagrams and anthropological considerations. Based on personal interpretation and understanding of function and site issues students accordingly make design decision and architectural interventions.

AR 212

History and Theory-II

Early China and Korea: Architecture, art and cities from China covering Shang, Zhou, Qin, Han, Tang, Song Dynasties. Art and Architecture in Korea covering three kingdom periods and Koryo Dynasty.

Early Japan: Architecture, art and cities from Japan before and after Buddhism including Jomon, Yayoi, Kofun Periods. Buddhist Japan including Asuka, Nara, Heian, Kamakura periods.

Classical Roman Period: Architecture, art and cities of Etruscan, Republic and Empire Period of Ancient Roman. Cities and engineering feats. "Treatise of Vitruvius" and other theoretical documents.

Middle Ages: Western Europe after the fall of Roman empire and the rise of eastern Byzantine empire. The advent of Church architecture and church as the central religious and political authority. The formation of guilds, their art and architecture. Early Christian, Byzantine Empire, Romanesque and Gothic art, architecture, theory and cities. Medieval Towns and their characteristics.

AR 221

Development Studies

Development Concepts: Introduction to concepts and terminologies of development. Perception, importance, measurement and overall understanding of Development. Theories of Development, Factors of Development. Concept and issues of Developing and Developed Worlds.

Development Approaches: Introduction to Systems Approach to Development. Ingredients and characteristics of a System. Various approaches to development such as RED, self-help, partnership, hybrid approach, etc.

Development and Economics: Basic understanding, concepts and terminology of economics, perfect market and real market mechanisms. Economic policy/relationship of economic policy and development, Industrialization and development, International financial institutions.

Development Institutions: Institutions for development. Achieving self-reliance. National defence and development. Planning for effective development. Agency for change.

Development Actors: Actors in development. Compositions of state and relationship with development. Civil society institutions and relationship with development. Private sector and development

Impacts and Practices: Globalization and its impacts on development. Development practice in Pakistan, Public sector development programmes. Project preparation process in development practice.

Case studies (from local and foreign context). Especially of people's initiatives. Concepts of self-help and organisation.

AR 231

Environmental Design and Systems-I

Introduction: Concepts and terminologies of environment, climatology and sustainability. Eco systems, geophysical factors, biodiversity, climate change, resources, pollution, energy, global warming, renewability and recycling. Man-environment and environment-building interrelationships. Environmental organizations and legislations.

Climate and Comfort: Climatic data and its constituent; Sun paths and angles, solar radiation, wind, rainfall, humidity etc. Climatic Zones. Sun-earth relationship. Time zones. Appropriate spatial typologies for different zones. Climatic analysis of regions in Pakistan.

Parameters of human comfort and relationship with climate components. Thermal comfort and indices. Techniques for promotion of comfort. Introduction to ventilation and air quality.

Sites and Siting: Sites and orientation. Building form and climatic control. Topography. Solar and wind Control. Macro aspects of sustainability. Master planning. Micro and site climate control.

Environmental Design and Control Systems for Buildings: Introduction to active and passive methods and techniques for environmental control in residential and commercial buildings. Design of shades and shading devices. Insulation and other features. International and local case studies.

AR 242

Communication and Skills-IV

Advanced Technical and Analytical Drawing: Advance architecture drawings from complex geometry to complex forms e.g., domes, tensile structures, and bridges, etc. Site planning and master planning.

Advanced Model Making: Point, Plane and Volume exploration through platonic models and installation art.

Introduction to complex forms of models. Models of complex buildings including residences, interiors, commercials highrises amenities and site models.

Architectural Presentations: Advanced methods of oral and visual presentations for Architectural and Urban Design.

Architectural Photography: Exploration of techniques for architectural photography. Subjects will include details of building interiors to exterior landscapes.

CE 251

Structure for Architects-I

Stress and Strain: Stress and strain in two and the three dimensions; Elastic constants; Stresses in elastic/working range; Stresses in materials subject to external constraints and stress transformation.

Principal Stress and Strain: Concept regarding normal, shear and principal stress and strains.

Elastic Constants: Relationship between elastic constants; Allowable and ultimate loads; Factor of safety.

Determinacy: Reactions for complex plan structures; Redundancies; Determinacy and indeterminacy.

Bending, Combined and Direct Stress: Simple theory of bending; Combined and direct stress; Stress due to bending in composite beams; Area and stress transformation.

Bending Moment and Shear Forces: Conceptual extension of bending moments and shear forces for continuous beams and frames.

Properties of Materials: Mechanical properties of reinforcing steel and concrete.

THIRD YEAR ARCHITECTURE **SPRING SEMESTER**

AR 301 **Architectural Design-III**

Design principles and process: Developing the creative ability of the student in terms of 3-D formal and spatial concepts; Development of an understanding of the transition from a conceptual to a schematic stage with an understanding of scale. Development of architectural vocabulary and its application for medium scale functional projects; Distinction between client's brief and architect's brief, development of design concept, site analysis, functional and formal implications of a design brief, design proposals for small scale buildings to demonstrate understanding of functional relationships, materials, structures, contextual issues, and climatic response; Generate theoretical debates around design projects related to architectural paradigms, social value of architecture, aesthetics and architecture, role of economics in architecture etc.

Studio Exercises: Medium scale projects (living space, monument, public rest rooms, mosque, clinic, school, apartment, etc.) introducing the concepts of scale, development of design brief and transition from concept to schematic design.

AR 311 **History and Theory-III**

Renaissance, Baroque and Rococo: The art and architectural style of the western world from 14th to 18th century, with emphasis on major centres and figures, in relation to the historical, theoretical, social, political, geographical and cultural context of that period. Age of humanism with accompanying innovations in painting and sculpture.

Theories and treaties in Architecture such as written by Alberti, Palladio, Fillarête etc. Developments in urban design and planning during the era.

Romanticism, Industrial Revolution and Modernism: Industrialization, urbanization and other changes of the 18th, 19th and 20th centuries which include introduction of new materials, mechanization of production systems, mass production, colonialism, spirit of enlightenment, world wars and their effects on art and architecture. Principles of architecture governed by famous slogans of "Form follows Function", "Less is More" and "Machine Aesthetics". Manifestoes and writings of the period. Cities developed in the 20th century.

Introduction to Movements of Modernity: Introduction and overview of art movements and paradigms of modernity; their salient features, inter-relationships, influences and key works.

Great Modern Masters: Life, works and philosophies of the key modern masters including ‘Walter Gropius’, ‘Mies van der Rohe’, ‘Frank Lloyd Wright’, ‘Le Corbusier’ etc.

AR 331

Environmental Design and Systems-II

Introduction: Concepts of building system and environmental control. Active building systems and their design. Services and systems approaches to residential and commercial buildings including high rises and large urban projects. EIA requirements and submissions.

Mechanical Air Control Systems and Design: Ventilation requirements and control. Air-conditioning and heating. Load calculation. Equipment, ducts and pipes, insulation, grills, diffusers etc. Sustainable and environment friendly HVAC systems.

Mechanical Circulation Systems and Design: Study of elevators, escalators, etc. Calculation of lift sizes and capacity. Space requirements of machine rooms, lift-wells and pits.

Acoustic Design: Study of sound, effect of noise on people, methods for acoustical treatment of spaces, reverberation time, echo etc. Study of acoustic materials. Acoustic data and analysis. Comfort indices of noise and pollution and sustainable practices for excess reduction.

Lighting and Electrical Systems: Electrical distribution system, circuit, wiring, lighting, electrical fittings, analysis of lighting levels, lumen calculations, daylight factors etc. Energy conservation and lighting control mechanisms.

Water Supply and Drainage Systems: Storage and water distribution systems in buildings; hot and cold water supply; underground and overhead tanks; pipe sizing; fire fighting systems; waste water disposal systems; fixtures and fittings; pumping systems septic tanks; soak pits; manholes. Water conservation and other aspects of sustainable water systems.

AR 351

Construction and Materials-III

Building Typologies and Construction Technology: Various building typologies (residential, commercial, public use, administrative, warehouses and industrial, temporary structures etc.) shall be understood in terms of use of materials and mode of construction including indigenous techniques, load bearing structures, frame structures, steel structures, pre-fabricated and pre-engineered construction etc.

Techniques for wall surfaces, cladding elements, flooring layers etc.

External Development and Finishes: External development and finishes of buildings include various types of plaster (plain, textured, pigmented etc.), paints, cladding (tiles, concrete panels, aluminium composite panels etc.), pavement, curbs, drive-ways, hard landscape, steps, ramps, infrastructure services, waterproofing and damp proofing etc.

AR 361

Introduction to Architectural Conservation

Introduction and Background: Historical development and background of conservation activities within international and national framework. An introduction to terminologies related to conservation and historic preservation. Introduction to features and characteristics of historic fabric and traditional settlements in Pakistan, with particular focus on Karachi and Sindh.

Theories and Approaches: Discussions on theories and philosophical approaches to conservation practice in the light of international charters and conventions. Understanding the national and international legislative framework and its implication to heritage protection. Familiarization with institutional/organizational networks involved in conservation work.

Understanding Historic Buildings: Introduction to structural systems, construction techniques and building materials used in historic constructions. Discussions on identification of common defects and problems in historic buildings with their causes and possible remedies. Experiencing documentation methods including measured surveys, inventory techniques and mapping of historic areas and towns using local case studies.

AR 381

Introduction to Landscape Architecture

Introduction to Landscape Architecture: Introduction to the basic concepts and historical developments in landscape design, an overview of landscape history, design theories, and philosophies. For e.g Chinese concept of Feng Shui, the Islamic Gardens as Paradise on Earth, Japanese Zen Garden etc. Relationship of landscape design and built form.

Principles and Components of Landscape Design: Basic elements & principles of design as they apply to landscape. Design exercises of small scale spaces in which the analysis of site, context and the requirements of human use are brought together in a creative synthesis with the principles and elements of landscape design. Components of Landscape Design along with an introduction of plant species and varieties to understand horticultural aspects in relation to design.

Categories of Landscape Types: Various types of gardens and their features. Features and experience of urban landscape (piazzas / squares).

FALL SEMESTER

AR 302

Architectural Design-IV

Design Principles & Process: Developing analytical thinking for varying familiar and unfamiliar site contexts with comprehensive study of the context and its application to design. The scale of projects is increased to include medium to large sized projects, introducing concepts of master planning, functional and formal relationships between more than one buildings, built and open spaces, with respect to context. To develop an understanding of spatial links between public, intermediary and private spaces.

Studio Exercises: Medium sized projects including social and cultural amenities (school, hospital, museum, park, rescue centre, auditorium etc.) with focus on zoning, master planning. Exploring concepts of vernacular, regional architecture, building extensions and adaptive reuse.

AR 312 History and Theory IV

Movements of Modernity: The principal movements of art and architecture in modernity such as Impressionism, Expressionism, Fauvism, Arts & Crafts Style, Art Nouveau, Art Deco, Cubism, Dadaism, Purism, Constructivism, De Stijl, Futurism, Brutalism, Pop Art, Constructivism etc.

Postmodernity and allied movements: The origin and historical evolution of postmodernity. Theory and practice of postmodern paradigms such as deconstruction, regionalism, neo-modernism, sustainability etc. Urban Design and city development trends from 1970s to present.

Master Architects and their works: Life, philosophy and works of key architects in light of their historical context and movements of art including the following;

- a) **Modern Masters** Adolf Loos, Alvar Alto, Antonio Gaudi, Louis Kahn, Louis Sullivan, Peter Behrens.
- b) **Postmodern Masters:** Cesar Pelli, Eero Saarinen, Frank Gehry, Michael Graves, Oscar Niemeyer, Peter Eisenman, Philip Johnson, Robert Venturi, Zaha Hadid etc.
- c) **Developing World Masters:** Ken Yeang, Hassan Fathy, Balkrishna Doshi, Charles Correa, Geoffrey Bawa, Luis Barragan, Ricardo Legorreta etc.

Modernity and Postmodernity in Pakistan: Historical development of architecture and the profession in Pakistan from post-independence to contemporary times. Questions of identity, culture and appropriateness of architectural style in the Pakistani context. Critiques of contemporary architecture.

Master Architects of Pakistan such as Mehdi Ali Mirza, Mino Mistry, M. A. Ahed, R. S. Rustumjee, Edward Durrell Stone, Abdul Hussain Thariani, D. R. Surti, Naqvi and Siddiqui Zahiruddin Khawaja, Habib Fida Ali, Nayyar Ali Dada etc.

AR 321

Housing and Community Development

Basics in Housing: Definitions; concepts; terminology

Housing Typologies: Single unit housing; row housing; high density housing; low density housing; medium density housing; detached housing.

Housing Approaches, Dynamics and Options: Built unit development; actors in housing; land allocation/plot provision; owner built housing; commercially developed housing; cooperative housing; social housing; public housing; mass housing; self-help housing; dynamics of squatter settlements; community development issues; incremental housing development.

Planning and Design Inputs: Upgrading; low cost approaches; consolidating; appropriate design options of building components; sociology and economics of housing approaches.

AR 341

Communication and Skills-V

Understanding of 3D Modeling through CAD (computer aided design) softwares, sketch-up and BIM (Building Information Modelling Softwares) along with material application and editing, lighting, camera, animation etc through different exercises starting from simple models of staircase types, lamps, metal gate, roof types to complex modelling of a Residence, High rise, Office Interior etc.

AR 352

Construction and Materials-IV

Internal Finishes: Use of various materials and methods of application for interior components of a building.

Floors of various types (plain cement floor, cc tiled floors, terrazzo tiles, ceramics tiles, marble, granite, wood, glass etc.)

Various materials finishes and methods used in creating partitions.

Walls such as cc blocks, glass blocks, wooden framework, paint, wall papers, fair-face finish, rectification of defects in plaster etc.

Various types of materials and methods used for construction of Ceilings including gypsum fibre board, MDF board, wooden panels, fabric etc.

Building Maintenance and Protection: Use of materials and their application in different context of various internal and external surfaces with respect to their durability, fire and disaster protection.

CE 351

Structure for Architects–II

Loads and its Implication: Loads on buildings; Implication of different loads on different structural material and elements.

Structural Response: Response of simple structural members to different loads and their combination; Basic structural requirements e.g. equilibrium, stability, strength, functionality, robustness, serviceability, ductility aesthetics and economy; Essential properties of structures materials.

Analysis of Simple Structure: Introduction to analysis of simple structure with simplified idealization with emphasis on qualitative analysis, including beams, frames, trusses arches and cables for static and moving loads; Deflection of simple beams with double integration method.

Design of RCC Section/Member: Design of RCC sections for flexure, shear, compression and compression plus bending.

Pre-Stressing: Introduction to pre-stressing; Underlying principles and losses.

Soil and Foundation: Soil properties and foundation; Structural principles for foundation, behavior and detailing.

Structural Drawings and Detailing: Symbolic representation, notations, conventions and signs commonly used; Concrete and reinforcement drawings; Steel connections.

FOURTH YEAR ARCHITECTURE

SPRING SEMESTER

AR401

Architectural Design-V

Design Principles and Process: Critical analysis of increasingly complex architectural design issues and developing design ability to address them. Projects involving multiple functions and complex spatial organizations with comprehension of issues related to project programme, site selection, users needs, materials, and technology, identification of structural systems, services and engineering systems.

Understanding the various clients and user groups of the city and their requirements. Exploring design of public spaces.

Studio Exercises: Large-span structures, mid-rise to high-rise buildings with comprehension of structure, services and engineering systems (acoustic, lighting, HVAC etc.). Projects focusing on thermal comfort and understanding services and construction details. Detail design project(s) as a series of small sketch problem exercises.

AR 403

Introduction to Interior Design

Introduction and terminologies: Introducing fundamental concepts of design at the scale of an interior design. Design elements (shape, line, value, texture, pattern, form, illusion). Introducing historical periods and styles with reference to basic space planning, requirements, design, layouts and furnishings.

Interior Design Theories and Application: Using interior design as a spatial problem solving tool; study of design principles applied to furniture layout and space planning for residential and light commercial spaces, including programming, codes, standards, space planning, drawings and presentations along with study of human factors affecting the interior environment, including ergonomics, and universal design; Study of materials, methods of construction and installation; colour theory and application; Fundamentals of lighting design, (lamps, luminaries, lighting techniques) and their applications for residential and commercial projects.

Interior Design Profession and Practice: A study of business practices and procedures for interior designers, including estimations for basic interior design applications, professional ethics and codes; project management, marketing and legal issues.

Interior Design Studio Exercises: Survey of an existing space focusing on its communication / presentation through drawings. Single or two room design exercises starting from a kitchen / bathroom, commercial interiors such as shops, offices, restaurant etc. with a final project of a bigger scale. For e.g. small residential apartment or a commercial interior may be developed addressing various design issues from drawing representation and the scaling system, to the choice of materials and colors etc.

AR 411

History and Theory-V

Geographical, cultural, social and religious context surrounding pre Islamic Arabia. Advent and spread of Islam. Development of a new form and its interface with the context. Spatial requirements of Islam. The birth and evolution of new spatial types including mosques, madrassas, mausoleums; palaces etc. Terms and definitions of Islamic Architecture Elements. Introduction to calligraphy, textiles, pottery, miniature and other art forms of Islam and their inter-relationship with Islamic Architecture.

Empire Building: Adaptation from the Classical Past: To describe the dialogue with the heritage of classical Greco Roman Syria under the Ummayyads (Damascus and Jerusalem) and to outline the growing Persian influences under the Abbasids with the Sassanian heritage in Iraq (Baghdad and Sammara).

Fragmentation of the Empire: Iran & Central Asia; Spain, North Africa: To study the political framework, geographical extant and the eventual breakup of the Empire. Architecturally, to introduce the eastern Islamic world by showing how Islamic forms developed by merging of monumental architectural influences from Damascus, Jerusalem and Baghdad with the traditional building techniques and materials of the extended region.

Threats from the West and East: *Crusades and the Mongol invasion of the World:* The resultant rise of defensive architecture due to the threat and onslaught from Europe under the Crusades, and the East (Mongolia). Influences of the nomadic culture of the Central Asian Steppes merges with the Western Islamic lands. This is seen under the dominance of the 'slave kings' in the Middle East (Ayubids), Egypt (Mumluks), and Sultanate India along with the development of the architecture style that evolved under the III-Khans and the Timurids.

Gun Powder Empires: *Ottomans, Safavids, Mughals:* This module will introduce the economic, militaristic and eventual artistic supremacy that lead to establishment of the gun powder empire. The study will focus on the fusion of architectural influences like the Greco-Roman style in Ottoman Turkey and the transformation of Central Asian and Iranian influences in Safavid Iran and Mughal India.

The Modern World: *End of the Caliphate/Colonization of the Muslim World:* The module will introduce the beginning of the Modern era and colonization of the Islamic world. To show the important debates and arguments that have sought to define the legacy of Muslim civilisations. Examples from the present day Islamic world and works of masters such as Hasan Fathy; Cengiz Bektash; Wahid Abdul Wakil, Vedat Dalokaye etc.

Theory of Islamic Art and Architecture: To introduce theories, philosophies and debates that form the basis of Islamic Art and Architecture. To discuss Islamic geometry, patterns and their proportionating systems

Urban Planning/Design under Muslim Rules: Urban codes and principles of urban design followed under the Muslim rulers. Case studies of historic and contemporary Muslim cities

AR 441

Communication and Skills-VI

Advance applications in renderings to the various graphic design software packages like 3D studio max, Rhino and their application in architecture.

AR 451

Construction and Materials-V

Communication in Construction: A complete set of working drawings for a Commercial and Residential unit consisting of ground plus one storey with 3-4 bedrooms, drawing/dining, kitchen, lounge, bathrooms, laundry, driveway and guardroom including all drawings.

Architectural Drawings for floor plans, roof plan, site plan, sections and elevations with all details of internal and external finishes, built in wardrobes etc.

Structural Drawings showing foundation details, beams, (dropping / inverted), slabs, lintels, projections, pergolas etc.

Plumbing Drawings for bathrooms including bathroom layouts, fixtures, fittings, pipes, manholes, gully traps etc.

Electrical Drawings showing electrical outlets (switches, sockets, power plugs, light plugs, telephone, TV antenna, cc camera, db etc.)

Preparation of BOQ and Specifications writing: Specifications writing and preparation of Bill of Quantities for a residential unit along with a cost Estimation for BoQ items.

Site Visit: Students shall be taken to various under construction projects throughout semester to prepare a checklist for the items to be inspected by the architects during construction.

FALL SEMESTER

AR 402

Architectural Design-VI

Design Principles and Process: Contextual concerns such as historical significance; natural, built, socio-economic and cultural environment including pedestrian and vehicular movements are interwoven with design process and its evolution. Design of complex buildings or group of buildings giving due respect to urban design and planning issues while considering the social, economic, physical & technological factors. Developing maturity, individuality and distinction in style of design product and process.

Studio Exercises: Projects involving expansion of existing buildings and/or rehabilitation of complexes or urban areas, as well as design of complexes and essential city level public facilities (including university campus, bus terminal, airport, railways stations, or seaport) are some of the design exercises undertaken in this semester. A long duration (approximately) two months project is undertaken as mini-thesis.

AR 421

Urban Planning and Design

Analysis of Cities: Current models of urban analysis and their evaluation for the developing world. Observing and Interpreting the Urban Environment through various techniques and modes of inquiry. Exploring methods of recording, representing and communicating the observations. Understanding the physical structure of the city with its streets, squares, public spaces, infrastructure etc. Developing graphic language of analysis through various mediums. Analytical studies of Pakistani and global urbanization, urbanism and city form.

Theories of Urban Design and Urban Planning: Conceptual Tools, Analytical Methods and theoretical frameworks to understand Urban Environments. Introduction to urban disciplines such as Urban Geography, Urban Anthropology, Urban Sociology etc. Survey of Planning Theory and its historical development. Review of central issues and recent developments in theories of urban design and planning. Link between theory and planning practice. Case studies in Urban Design and Planning.

Cities of the World: Historical development of cities of the world; The variation in the physical form of cities of the world. Contemporary problems and issues within cities and assessment of the contemporary urban planning directions.

Urbanisation, Cities and Urban Planning in Pakistan: Historical forces that have shaped the cities in Pakistan and evolution of the profession. Types of settlements with respect to their size, form, issues and stakeholders. Special studies on the city of Karachi.

Professions of Planning and allied disciplines: Evolution of the profession of planning; Roles of professionals; Professional inter-relationships between architecture, urban design, urban planning and regional planning. Actors and Stake holders such as public officials, clients, media, and the different users.

AR 431

Environmental Design and Systems-III

Concepts and Terminologies of Green Buildings and Development: Concepts of sustainability, green buildings, rating systems and other terminologies. Link with aspects of ecology, climate and environment. Overview and comparison of contemporary rating systems. LEED and WGBC. Professional aspects of certification systems and certified professionals. Basic Principles of Green Buildings. Energy cycle and lifetime cost of buildings. Case studies of Green Buildings and Sustainable cities. Sustainable architecture in Pakistan. Computational tools for green aspects.

Introduction and some aspects of green urban development, construction, products and other aspects.

Sustainable Sites: Sustainable site selection considerations. Construction Activity Pollution Prevention. Alternative Transportation requirements. Siting and building footprints. Open Space configuration and design. Site development principles; heat island reduction, minimizing transportation, reducing light pollution etc. Infrastructure considerations; Storm water design.

Water Efficiency in Green Buildings: Water Use Reduction. Innovative Wastewater Technologies. Water treatment options. Water Efficient Landscaping.

Energy and Atmosphere in Green Buildings: Assessment and control in Building Energy Systems. Renewable energy sources and local appropriateness. Energy Conservation. Energy Performance Index. Building envelope design for maximizing energy performance.

Materials and Resources in Green Buildings: Characteristics of recycled, renewable and sustainable materials. Re-use mechanisms. Sustainable building systems. Construction waste management. Regional and locally sustainable materials for Pakistan.

Indoor Environmental Quality in Green Buildings: Standards, statistics and measurement tools in air quality. Pollution and emission control. Ventilation mechanisms. Environmental Quality Management Plans. Design of thermal comfort and controllability of systems. Use of day lighting and views.

AR 461

Research Methodologies

Introduction to Architectural Research: Definitions; applied research; scientific research; design research.

Fact Finding Methods: Observations and documentation; surveys; interviews; forum discussions; photographic documentation.

Research in Applied Architectural Disciplines: Urban and regional planning; urban design; urban conservation building restoration; building sciences; building construction.

Principles of Scientific Writing: Bibliographical referencing; types of referring; writing manuals; types of research materials; refereed journals; monographs; treatises; handbooks; understanding and interpretation of architectural texts.

Presentation: Report layouts and formats; port folios; exhibits; presentation folders; fact sheets and summaries; graphical modes and media.

CE 451

Structure for Architects-III

Structural Drawings and Detailing: Horizontal span structural system; floor and roof structures; Single story enclosure system; Vertical building structure systems, such as walls, columns, frames and cores etc; Structural system in residential construction, industrial construction and multi-storied building.

Roof Floor Framing Systems: One way and two way slabs; Waffles, flat slabs and flat plates, grids and inter connected beams, ribbed slabs; Steel and composite decks.

Lateral Load Resisting Systems: Resistive mechanism for load bearing structures, moment frames, shear walls, cores, tubes and tubular structures; Earthquake loads and its distribution and resistance through structural systems; Diaphragm action of horizontal building planes; Stability of vertical structural building units, story drift and over tuning.

Structural Planning: Basic structural components and their structural integrity; Mechanism of load distribution and resistance; Distribution of stiffness of structural elements; Continuity, symmetry, height, mass and geometry; Importance of different structural elements to resist various types of loading in reinforced concrete, wood and steel construction.

Non Planar and Large Span Roofing: Structural behavior of pitched roofs, domes, shells, folded plates, cable suspended roofs, dishes and cable-stayed roofs; Verendial girders, and trusses; Stability consideration and materials.

Water and Earth Pressure Loads: Structural behaviour of basement walls, retaining walls, underground water tanks, reservoirs and swimming pools; Resistive mechanism and structural stability of elements; Earth sheltered building.

FIFTH YEAR ARCHITECTURE

SPRING SEMESTER

AR 501

Architectural Design Project

The students undertake a thesis design project of their own choice in any domain of architectural studies. They develop thesis statement, work out a study methodology and undertake research towards a design solution. Series of visual presentations and a thesis report on the prescribed format is done in the conclusion.

AR 521

Comprehensive Environmental Design

This course is based on focused study of micro environments. Under the guidance of course incharge, the students will study the following aspects of the chosen micro environment:

Societal Understanding: Historical background; cultural denominations; sociological characteristics, economic status, physical aspects of the settlement.

Design Tools: Documentation and survey procedures; modes of data collection; analysis; synthesis; preparation of planning and design briefs; proposal development; presentation modes.

AR 552

Construction and Materials-VI

Construction Technologies: Advanced techniques in excavation, boring, shoring, bracing and casting of reinforced concrete foundations; techniques of building deep water-proof basements; erection of super structure in reinforced concrete, pre-cast concrete and steel; specialised form work e.g. slip forming; form work for large span roofing and stack like structures.

Construction and Materials Technologies for Special Structures: Cable suspended structures; tensile and membrane structures; space frames; geodesic domes; various shell forms, dishes and catenary forms with emphasis on constructional details and materials.

Material Technologies: Recycling of conventional construction materials; cement replacement materials; new reinforced concrete e.g. Ferrocement, fiber reinforced concrete, natural fibers; sulphur and sulphur impregnated concrete, aggregate replacement; plastics as structural material.

Strengthening and Re-Strengthening of Structures: Techniques of strengthening and re-strengthening from conventional to newer techniques; repair of structurally damaged buildings; live problems in building structures such as cracks, dampness, settlement, their causes and remedies.

FALL SEMESTER

AR 561

Professional Practice

The objective of this course is to allow a familiarisation with all the practical aspects of setting up a practice in the profession of Architecture:

Legal Modalities: Legislations/documents/ licenses, (Sindh Building Control Ordinance (Amended) of 1983; byelaws; penalties; arbitration; professional ethics; professional organisations/membership; future challenges.

Office Management: Pre-requisites; space requirements; administrative setup; financial control/feasibility; dealing with staff/employees; growth/ progress selection/dealing with contractors/consultants.

Client Dealing: Etiquettes; types of meetings (initial introduction, preparing the design brief; schematic proposals; final approval; presentation/ delivery; submission drawings/N.O.C.; construction/supervision agreements); co-ordination with contractors/ consultants.

Site/Project Management: Clearing/leveling; demarcation; excavation; field staff; security/storage; supply of materials; cash-flow schedules; purchasing; quality-checks; sub-contracts; structure; wood-work; finishes; CPM (critical-path-method); building systems (proto-typical; individual; supply-line techniques; 'turn-key' system); progress-reports; related computer software; handing/taking-over; documentation and portfolio entries; retention of field-staff.