THEORY BASED COURSES

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**

Name OF Program: **Five Years B.Arch** Year: **First Year**

Course Code: **ARC 130** Course Title: **History of Architecture**

Number of: Lectures= **64** and Credits= **04**

Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:

The syllabus has been dealt with the premise that all civilisations evolved a central thought, which was shaped by individual beliefs and local factors. This central thought of the civilisation has permeated in various related fields such as religion, arts, science, litterature, social and economic setup, which inturn were instrumental to the evolution of architecture specific to the area. The course, covering Prehistoric age and Early Civilisations, attempts at sensitizing the students to view architecture as one of the many products of the civilisation. The emphasis is on the understanding of conceptual basis rather than specific and complex questions about the architecture.

SYLLABUS OF COURSE:

UNIT - I

Part A (Number of Lectures/Studios: 3)

Prehistoric, Paleolithic and Neolithic Systems; Cave Dwellings in Europe: Lascaux, Chapelle-Aux-Saints; First attempts at Marking Nature: Terra Amata, Skara Brae, the megaliths, obelisks, Compositions such as StoneHenge; Beginnings of Agriculture and Settled Life, First Settlements like Jericho, Catal Huyuk.

Part B (Number of Lectures/Studios: 4)

River Valley Civilisations in Egypt and Mesopotamia; Growth of Settlements, Religious and Social Architecture. Egypt: Social systems, religious beliefs, science and writing; Evolution of Tomb Architecture: Mastabas, Pyramids at Saqqara, Medun and Giza; Mortuary Temples: Hatseshut; Cult Temples: at Luxor and Karnak. Mesopotamia: the Sumerians, Babylonians, Assyrians and the Persians; their Art, Intellectual Achievements and Developments in Law; the Ziggurats at Ur, Choga Zanbil, etc.; the cities of Ur, Babylon, Khorsabad and Persipolis.

UNIT - 2

Part A (Number of Lectures/Studios: 3)

River Valley Civilisation in China: Dynasties such as the Shang, Chou, Ch'in, Ming, etc.; Political History, philosopy, and scientific achievements; palaces like the Imperial Palace, forbidden city; Altars and Temples; Imperial Tombs. Early Civilisation in South America**:** the Mayas, Aztecs and the Incas; Pyramid Temples at Cuicuilco, Palenque; Pyramid of the Sun, Teotihuacan; Tikal; Tenochtitlan, Chichen Itza and Machu Pichu.

Part B (Number of Lectures/Studios: 4)

Bronze Age Indus Valley Civilization in India: Town Planning, Trade and Commerce; Mohenjodaro and Harappa.

Early Iron Age Civilisation in India: the coming of the Aryans and Vedic Age; Epic Age; development of Hinduism Religious and Caste systems, Wooden Origins of Indian Architecture: Forest Dwellings, Kutiya and Grama.

UNIT - 3

Part A (Number of Lectures/Studios: 3)

Early Iron Age Civilisations in Greece: Minoan, Myceanean and Classical Greek
Minoan and Mycenean: Palace at Knosos, the Lion Gate, the appearance of the Megaron. Classical Greek: Developments in philosophy: Socrates, Aristotle, Plato; science; litterature; Greek City states; Evolution of the Temple; the Orders; the Parthenon, Temple of Zeus, Temple of Athena; Polis and Acropolis.

Part B (Number of Lectures/Studios: 4)

Early Iron Age Civilisations in Rome: Political, social, philosphical and military developments. Structural and Enginnering Acievements: the arch, Vault and the dome; Developments of the orders; Temples: Pantheon; Arenas: Colloseum; Therma: Caracalla; Aqueducts; the forum and the basillica

UNIT - 4

Part A (Number of Lectures/Studios: 3)

Early Iron Age Civilisations in India: Beginning of Buddhist and Jain Architecture; philosophy and teachings; the Hinayana and Mahayana Sects and their contribution to the development of architecture in India. Ashokan School, Buddhist Rock Cut Architecture: the Chaityas and Viharas at Ajanta and Ellora; the Stupa: Form and Evolution; Buddhist Architecture in Gahdhara.

Part B (Number of Lectures/Studios: 4)

Early Iron Age Civilisations in India: Beginning of Hindu Temple Architecture under the Guptas and Chalukyas. Appearance and Evolution: Experiments at Badami, Aihole of examples such as Ladh Khan, Durga, Maleguti.

Text Books:

1 Arjun Dev, The Story of Civilisation, Vol. I (Old) NCERT History Textbook for Class IX.
2 G.K. Hiraskar, The Great Ages of World Architecture.
3 Percy Brown, Indian Architecture, Buddhist and Hindu
*4 Spiro Kosto*ff, History of Architecture, Rituals and Settings.

Reference Books:

1 C. Tadgell, The History of Architecture in India
2 Bannister Fletcher, History of Architecture

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **First Year**
Course Code: **ARC 140** Course Title: **Theory of Structures (Applied Mathematics & Applied Mechanics)**
Number of: Lectures= **128** and Credits= **08**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:

This course is to provide the students with basic concept of mathematical principles, leading to primarily an easy understanding of various topics under "STRUCTURE". The course also provides basic clues to mathematical models and research techniques in the field of architecture. Last, but not the least, this course aims at developing an understanding of proportions and 3-dimensional geometry as an aid to design skills.
The objective of the course is to develop a feel for structural principles as they relate to a building design, to enable him to make an informed choice regarding the most appropriate structural system for this building and to develop a reasonable understanding of its operational and economic implications.

SYLLABUS OF COURSE:

UNIT - 1 (Mathematics)

Differentiation: Maxima & Minima: Concept of Increasing & Decreasing functions, Turning Point, Conditions for a function to be max. or minimum. Point of inflexion
Integration: Area under the curve
Differential Equations: Definition, Order & Degree of differential equation, General & Particular solution, formation of differential equation whose general solution is given, solution of differential equation by method of separation of variables, homogeneous differential equation, linear differential equation of type $dy/dx + p(x)\, y = q(x)$; $q(x)$ & $p(x)$ are functions of x. only.
Partial Differential Equations: An Introduction
Surface Geometry
3-Dimensional Co-ordinate geometry
Proportions: Golden series, Fibonacci series etc.
Mensuration: 2D: Perimeter & Area of plane figs like Polygons, circle & semicircle 3D:Cuboids, Cubes: Surface Area & Volume Surface Area & Volume of Cylinder, Cone and Sphere.

UNIT - 2 (Mathematics)

Center of gravity: Definition, Calculation of CG of plane figures, like I, T,L,C,O, hallow & Box sections
Moment of inertia: Definition, Calculation of CG & MOI of plane figures about the principal axes e.g. rectangle, triangle & circle. Parallel axes theorem, perpendicular axes theorem, MOI of simple plane figs. like I, T,L,C,O, hallow & Box sections.
Introduction to Geometric mapping
Cartography
Introduction to mathematical models

Statistical Techniques: Data, frequency & frequency curve, cumulative frequency table, mean, median, mode. Standard deviation, correlation, regression.

UNIT - 3 (Mechanics)

Introduction to statics: Forces , their definition, characteristics & types, composition & resolution of forces.

Concepts of forces as loads: Dead, live, Horizontal loads like Earth quake & wind load

Laws of Equilibrium of forces: Parallelogram law, Lami's theorem, moment & couple, conditions of equilibrium.

Elementary structural systems & their components: Building forms concept of Load Bearing walls & framed structures, Concept of load distribution on structural components like Slabs , Beams, Columns & Foundations.

Support Reactions: Statically determinate and indeterminate systems, Degree of freedom, free body diagrams, type of supports, loading representations. To determine the support Reactions for a simply supported, Roller supported & Hinged beams for UDL, Concentrated loads ,triangular, & trapezoidal loads : idea only.

Hooke's law, stress & strain: Concept of direct forces (compression & tension), Elasticity, Plasticity etc. Hooke's law, modulus of Elasticity, Elastic limit stress/strain curve for mild steel under constant tension. Problems on Hooke's law & introduction to temperature stresses.

Concept of Euler's load & Buckling: Idea of short & long columns. Effective length for various end conditions. Euler's formula and calculation of Buckling loads. Combined Direct & Bending stresses. Concept of Eccentric loads. Calculation of CG, MOI & Section Modulus for calculating Bending Stresses.

UNIT - 4 (Mechanics)

Introduction to simple determinate frames: Method of Joints. Method of Sections. Graphical Method.

Statically determinate beams: To determine the support reactions for cantilever & beam with overhangs for UDL, Concentrated loads, triangular, & trapezoidal load idea only.

SFD & BMD: Definitions of SFD & BMD, sign conventions for SFD & BMD. Draw SFD & BMD for simply supported, cantilevered & overhanging beams for various loads like UDL and Concentrated Concept of locations for max BM, point of contraflexure. Calculation of combined Direct & Bending stresses and draw Net Stress diagrams.

Text books:

1. Mechanics of solids by Popov
2. Higher Engineering Mathematics by Grewal

Reference Books:

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Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **First Year**
Course Code: **ARC 141** Course Title: **Climatology**
Number of: Lectures= **32** and Credits= **02**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
Introducing, the Modern Science of Climatology in the context of climate and weather as determinants of Design and Form of Habitat and Landscape throughout the ages at the Macro and Micro levels. Emphasis on application of knowledge to building design.

SYLLABUS OF COURSE:
UNIT - 1 (Number of Lectures: 3)
Introduction to Climatology, Relation to Architecture, Macro Climate, Role of the Designer, Climatic Zones, Architectural Responses Around the Globe for Different Climatic Zones, Introduction to Concepts of Design. Global Climatic Factors - Earth's Thermal Balance, Thermal Forces, Seasonal Changes, Winds. The Changing Climate, Factors Responsible for Change, Global Warming, Ozone Depletion, etc.

UNIT - 2 (Number of Lectures: 4)
Thermal Comfort Factors and Balance, Body's Mechanism of Heat Production and Loss, Methods of Heat Transfer, Comfort Scale, Effective Temperature, CET, Heat Exchange of Buildings, Internal Heat Gain/ Loss,
Sol Air Temperature, Solar Gain Factor, Thermal Quantities: Temperature, Heat, Heat Flow Rate Specific Heat, Conductance, Resistance, Surface Conductance, U value, Periodic Heat Flow, Time Lag & decrement factor, Effect of Different Materials, Effect of Multilayered Bodies - Insulation/Cavity.

UNIT - 3 (Number of Lectures: 3)
Architectural Design as a Response to Climate: Tool for Design in All climatic Conditions of India Microclimatic Factors, Landform, topography, Vegetation type and Pattern, Water Bodies, Street Widths and Orientation, Ground Character, Plan Form and Elements, Building Orientation, Roof Form, Fenestration Pattern, Orientation and Configuration, Controls like Shading Devices, Design of Shading Devices: Solar Azimuth and Altitude, Angle of Incidence, Wall Azimuth, Shadow Angles, Overheated Period, Sun Path Diagrams

UNIT - 4 (Number of Lectures: 4)
Architectural Design as a Response to Climate: Tool for Design in all Climatic Conditions of India Walls, Choice of Materials, roof Materials, External Colous and Textures, Layouts and Internal Finishes. Solar Passive Heating and Cooling Systems, Roof Pond, Trombe Wall, Green House, Ventilation. Principles of Ventilation of Buildings, Air Flow, Stack effect, Wind Tower.

Text Books:
1 *Koenigsberger, Ingersoll, Mayhew, Szokolay,* Manual of Tropical Housing and Building, Climatic Design.
2 *Arvind Krishan, CASA, SPA,* Climatically Responsive Energy Efficient Architecture, Volume I: Basic Principles and Elements.

Reference Books:

1 *Arvind Krishan, CASA, SPA,* Climatically Responsive Energy Efficient Architecture, Volume II: Data Base Indian Context.
2 *Markus, Morris,* Buildings, Climate and Energy.

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Second Year**
Course Code: **ARC 230** Course Title: **History of Architecture**
Number of: Lectures= **64** and Credits= **04**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:

The course focuses on architectural products of various times and places within a broad chronological band. The emphasis of the discussions is on the nature and essence of the architectural product, related as far as possible to history of the process of their conceptualization, and process of construction. Use of the concepts of Style/ Typology/ Morphology in histories of architecture.

SYLLABUS OF COURSE:

UNIT - I

Part A (Number of Lectures= 3)
Architecture of Buddhist origin and associations in India
Sri Lanka Far Eastern Countries Tibbet China Japan Viharas Chaityas and Stupas and Monesteries

Part B (Number of Lectures = 4)]
North Indian Temple architecture (circa 6^{th} –12^{th} C), Important temples in North and Central India. Orissa. Khajuraho etc.
South Indian temple architecture under the Chalukyas, Pallavas, Cholas, Pandyas and important temples like Meenakshi Brihadishwara etc.

UNIT - 2

Part A (Number of Lectures =3)
Early Islamic architecture in the Middle East, Architecture in Mediterranean region, North Africa, South Spain.
Orthodox Christian, Byzantine &, Venice, Constantinople Romanesque

Part B (Number of Lectures/ = 4)
Ecclesiastical Gothic Architecture in Continental Europe and England.
Great Cathedrals - Notre Dam, Canterbury, etc.

UNIT - 3

Part A (Number of Lectures = 4)
Islamic architecture in India. Brief Chronological introduction to dynasties in North India, Slaves Khaljis, Tughlaqs, Lodhis ani Mughals. History written in terms of “Styles” indicating dynastic and regional variations
Morphologies / Functional Typologies, Mosque Tomb and Garden Pavilion Forts Palaces with examplesThe Quwwat-ul-Islam Mosque/Qutab-Minar Tughlaq - Alai Darwaza/Tomb of Ghias-ud-din Tughlaq. Gujarat – Jami Masjid in Champaner, Bijapur - Gol Gumbad & Ibrahim Rauza

Part B (Number of Lectures= 4)
The Mughal Period Babur and Humayun – Tomb gardens/pleasure gardens, Akbar – Fatehpur Sikri, Shahjahan – Taj Mahal (Agra), Jami Masjid (Delhi)

Exchanges between Islamic Traditions and Local building practices like Rajasthan and other Regions including the Ganga Yamuna Doab. The Riparian Ghat structures of North and Central India

UNIT - 4

Part A (Number of Lectures = 4)

Advent Renaissance in Europe and impact on Architecture.

Late Mughal, Lucknow Nawabi and Early European/Colonial period Architecture in India.

Part B (Number of Lectures = 4)

Early to High Renaissance, St. Maria Del Fiore, (Florence), Late Renaissance, Baroque Michelangelo, Palladio, St. Peters (Rome). St. Paul's (London).

Neo-Classical Architecture. Renaissance to Revival in England as background to British Colonial Architecture in India

Text Books:

1. Indian Architecture (Islamic Period), by Percy Brown).
2. The History of Architecture in India, by Christopher Tadgell.
3 History of Architecture by Sir Banister Fletcher (Selected Portions)
4. History Indian of Architecture Satish Grover

Referene Books:

1. Sense of Unity, by Nader Ardalan and Laleh Bakhtiyar
2. History of Architecture David Watkin
3. Architecture of Humanism by Roger Wittkower

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Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Second Year**
Course Code: **ARC 231** Course Title: **Art & Architectural Appreciation**
Number of: Lectures= **64** and Credits= **04**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
The course aims to equip the students to develop analytical and critical skills for looking at art and architecture. The specific objectives are: A. to develop a *way of seeing*, to contextualize art and understanding it as an expression of human faith, creativity and of complex social, economic, political, religious influences; to develop skills for determining the meaning/ value of an art work in terms of external (aesthetic relationships) and internal links (structure) as well as its social functioning or social judgement. B. To introduce students to fundamental principles of architecture and architectural design, basic ideas of theoretical and historical approaches to architecture for analysis and design; to develop an understanding of Ideas, Concept, Form, Function and Meaning with respect to architecture; to introduce the students to the aspects of Production, Representation and Categorisation of architectural objects and processes.

SYLLABUS OF COURSE:
UNIT - I (Art Appreciation)
FUNDAMENTALS OF ART:
- Form: Line, Colour, Texture, spatial qualities and composition.
- Ordering Principles: Balance, Contrast, Scale, Movement, Symmetry, Asymmetry, Centrifocal, Bifocal etc.
- Content: The idea concerned with the work of art. On one hand relates to Symbolism, Iconography, Magic, Myths and allegories and Religion and rituals. On the other with representation of the social and secular life on the other.
- Functions of Art: as a social phenomenon, as information, as a concept ora suggestion, as education or as enjoyment.
- Techniques: Includes the various applications of materials for various kinds of art forms.

CONCEPTS OF ART:
- Aesthetics: Discuss theoretical models of the Aesthetic. Dwell on the paradigms of theoretical perception of Beauty.
- Perception: Understanding Art as the object of Perception.
- Communication: Artistic text as language. Art as the crystallized experience of communication.

UNIT - 2 (Art Appreciation)
NATURE / ISSUES OF ART:
- Values: Deals with artistic thinking in its context leading to a set of codes determining the value of an art work.
- Styles: as the structure of art, like Realism, Naturalism, Expressionistic or Abstraction and so on.
- Modes of Art: Existence of diverse branches of Art- from two dimensional art like painting to three dimensional art like sculpture to mixed media art like installations and further on to more ephemeral forms like video or digital art.

UNDERSTANDING ART:

- Understanding the Meaning of Art through the ages- decoding various layers in artwork:
- Pre-Modern
- Modern
- Post-Modern

UNIT - 3 (Architectural Appreciation)

Central problem of Design Theory

- How is the Idea Generate?
- What Influences its shape?
- From what it is derived?

Theories of Form: Form follows Functions/Creative imagination/Spirit of the age/Social and Economic Conditions/Timeless principles

Notes on Element/ Thing/ Relation/ Representation/ Concept/Notion/ Idea/ Principle/ Doctrine

Interpretations of Vitruvian Triad: Firmness/Commodity/Delight

Primary and Secondary Categories in Architecture

- Form
- Function
- Meaning
- Context
- Construction
- Will

UNIT - 3 (Architectural Appreciation)

Form and Formalism

- Elements: Line, Plane, Volume
- Structure: Axes/Grid, regularity/Repetition, proportion
- Aesthetics: Beauty, Formal Order (Unity/Variety/Harmony), and Esthetic Theories.

Minimalism, Mannerism

Function and Functionalism

- Systems: Planning, Services Value and Economics
- Functions: Towns and Cities, Building Types Human Activities
- Human Values)Psychology and moralty: Sociology, Psychology, Morality (In terms of form Function Meaning)

Brutalism, Rationalism (in Architecture)

Meaning and Historicism (Ref.1,2,3)

- Associations: Resemblance, Classification and Typology, Taste Fashion and style
- Signs and symbols: Symbolism, Semiology, Semantics and language.
- Discourse: Criticism, Theory, History

Academism (Beaux-Arts, Bauhaus), Post-Modernism

Text Books:

1. Architectural Theory, Vol 2, Principles of Twentieth Century Architectural Theory arranged by Category, David Smith Capon, John Wiley & Sons, Chichester, England 2000, (pp.i-xii, 1-140)
2. Architecture - Form, Space and Order , Francis D K Ching, Van Notstrand Reinhold, New York. 1996 (For Graphics)

Reference Books:

1. Paul Alan Johnson, Theory of Architecture pp. 272-276, 288-292, 399-417
2. Roger Scruton, Aesthetics of Architecture (On Style Taste Fashion essence etc)

3. Alan Colquhon, Modernity & Classical Tradition pp. 1-21

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Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Second Year**
Course Code: **ARC 232** Course Title: **Sociology and Psychology**
Number of: Lectures= **64** and Credits= **04**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
This course aims to expose the students to the relationship between man and his larger environment, with special emphasis on aspects that are likely to affect intervention in or creation of, the built environment. The objectives of the course are to familiarize the students with basic concepts/ theories of sociology/ psychology as relevant to architecture, to introduce students to key issues in historical and contemporary global and urban sociology/ psychology and to develop a language and vocabulary for discussions/ analysis on the sociological/ psychological dimensions of architecture.

SYLLABUS OF COURSE:
UNIT - 1 (Sociology)
Origin of Man and Society
- Unique characteristics of Man: Symbol using animal, Tool making animal
- Theory of Evolution
- Evolution of man: Apes to man
- Biological foundation of Human Behaviour
- Man as a Social Animal: Instincts versus Drives.
- Organic Basis of Man's Capacity for culture
- Human nature and process of Socialisation

Culture and Society
- Concept of Culture
- Cultural Identity, Cultural Diversity, Cultural relativism.
- Ethnocentrism , Cultural universals

Elements of culture
- Folkways, Norms, Mores, Values, Laws, Social Institutions
- Material products of cultural objects or artifacts

Human Nature and Process of Socialisation**:** Types of Society;
- Pre-Modern: Hunter's and gathers, Pastoral agrarians and Traditional states
- Modern
- Third world/Traditional Society

Social & Cultural Change
- Factors of Social Change, discovery and invention, culture diffusions, ideas & ideologies, collective action, technology
- Resistance to Social Change, Theory of Cultural lag, Technology & Social change
- Interaction of Technology, Geography & Culture
- Meaning of Environment, natural and cultural, Ecological Balance, Cultural Environments, natural aspects of Culture, Man made geographic patterns.
- Geography & natural environments: Mountains, plains, rivers & oceans, natural resources.
- Relations of Natural Environment to culture extent of influence natural environment, cultural choice, similar habitat different response, different habitat and common response.

- Natural barriers & human differences, Natural environment and transportation, natural resources and limits of growth, Pollution and conservation.

UNIT - 2 (Sociology)

Population and Demography

- Population growth, population subsistence & natural resources, Malthusian doctrine, optimal population, Birth rates, death rates and economic growth/development.

Social Interaction and every day life:

- Non-verbal communication, social rules, conversation and talk, face body and speech in interaction. Encounters contexts and locations personal space interaction in time and space. Every day life in cultural and historical perspective.

Social Institutions, groups and organization

- The concept of institution. Forms of association-primary and secondary groups, formal organization. Bureaucracy and bureaucratic organization . Non-bureaucratic organization. Influences on organizations in the modern world.

Social Stratification:

- Concept of social Stratification. Types of social stratification estates, caste and social classes. Social mobility, poverty & inequity. Class consciousness and class conflict. Racial and cultural stratification. Race and culture, Racial prejudice and discrimination , regional age and gender stratification . regional differences communities and neighborhood and geographic conflicts. Sexual stratification, women in the workforces. Age stratification.

Globalization of Social life:

- Third world societies: economic consequence of colonialism, divergence between rich and poor continues. Theoretical perspectives imperialism, dependency. Inter natural economic integration, globalization of media.

Modern urbanization :

- The traditional city, feature of modern urbanism, theory of urbanism, Chicago School, Urban Ecology, urbanism as way of life, urbanism as created environment, Harvey- the restructuring castle: urbanism of space. Western urban development, Third world urbanization.

UNIT - 3 (Psychology)

- Introductory: Nature of relationship between psychology and spatial behaviour with special reference to Architecture, Urban Design and Physical Planning.
- Territoriality: Concepts ethnological Basis, Function. Territorial organization among Humans, Three Major Types of territorial space: Micro Space, Meso-Space and Macro-space.
- Personal Space: (Micro-Space) Meaning variation in personal space behaviour due to social Psychological Environmental and Cultural facto4rs; Personal space and environment with special reference to Interior Design of Public Places.
- Home Base (Meso Space)Psychological Functions of Home; Determinates of Housing preference; Concept of Neighbouhood as unit of Physical Panning, Subjective definition of Neighbourhood and the related Hierarchy in terms of Interpersonal relationships; Critique of Planners Ideological construction of the meaning and purpose of neighbourhood.

- Home Range (Macro Space) Hierarchy of Social Spaces: Home Base and range; Spatial pattern of activity System- Time Budgets. Origin and Destination Survey, Orbits of activity and social factors of Class and Sender.
- Cognitive Patterns Mental Maps and orientation Lunch's Theory of Cognitive Mapping; Social and cultural variations in the description cognitive Mapping techniques, Impact of activity on mapping by individuals capsule Images of the whole city.

- Environment: Meaning, Nature of relationship between Environment, Organism and Behavior Theories of relationship between Environment and Behavior.
- Hierarchy of Environments: Behavioral Perceptual Operational and Geographical Operational environment and its sub-division; phenomenal, personal and contextual.

UNIT - 4 (Psychology)

- Perception: Meaning of Perception, Appreciation cognition, Attitude, and Behaviour.
- Phenomenal Environment: Human Sensory Deprivation and overload; Deviance and pathology in cities; Crowding in Human population, Density and behavior as mediated by culture and society.
- Phenomenal Environment: Physical Various types of environment and related patterns of behavior : Street Home, Work Place, School, Prison, Residence conditions for positive interaction thorough Architectural Designing Behavior- setting and behavior – nature of relationship.
- Personal Environment: Behavioral and Experiential: Nature of relationship behavior Phenomenal Environment and Personal environment in determining Perception and Attitude, Role of values in formation of attitudes, attitudes and preferences, perception of preference with reference to simplicity complexity dimension of Design.
- Contextual Environment 1: Dwelling and Habitual Selection on the basis of stages in life – cycle and socio-economic status.
- Contextual Environment 2: Poverty and Ghettoization, with special reference to slums and JJ Colonies, Public Housing and behavior of relocated tenants, with special reference to resettlement colonies.

Text Books:

1. Social Science by Hunt and Colander.
2. Sociology by Anthony Giddens.
3. Porteous, J. Douglas (1977), Environment and Behaviour Reading (Mass) Addison-Chapters 1-11.

Reference Books:

1. Advanced Reading Suggested (Reference), Rapoport, Amos (1977): Human Aspects of Urban Form, Oxford, Pergamon Press

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Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Second Year**
Course Code: **ARC 240** Course Title: **Theory of Structures**
Number of: Lectures= **128** and Credits= **08**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
The objective of the course is to develop a feel for structural principles as they relate to a building design, to enable him to make an informed choice regarding the most appropriate structural system for this building and to develop a reasonable understanding of its operational and economic implications.

SYLLABUS OF COURSE:
UNIT - 1
Masonary Structures: Introduction, Structural property and allowable stresses
Design of simple load bearing masonary building: brick, mortars.
Slenderness ratio , load transfer from walls & slabs to supporting walls.
Simple House: Load calculation & design of walls. Foundation spread concept of arches, vaults & domes.
Timber Structure: Structural timber available in India, Structural properties and their allowable stresses, Design of Beams.
Simple M/Z application & shear check for forces along the grains(no slopes)
Design of timber posts & trusses for simple cases.

UNIT - 2
Steel: structural properties and allowable stresses
Connections in steel
Introduction to welding
Merits & Demerits, types of welding.
Design of welds.
Sizes, length.
Bolting: Introduction
Types & types of failures.
Design of simple joints.
Axial Members = Tension & Compression.
Steel Trusses = Types, spans
Terminology of trusses. Design of members(No Analysis)
Vertical Members : Design of Columns.
Slenderness concept idea of assembled (No design of Lacing)
Simple design of Bending of members using M/Z eqn.

UNIT - 3
Concrete technology: Structural properties and allowable stresses
Cement manufacturing & properties
Concrete: Structural properties, variation of strength with age

Factors affecting strength of concrete.
Cube strength, slump + compaction factor test, standard strength , Grades ofConcrete. Concept of w/c ratio & its effect on strength of concrete, curing, Nominal mixes & Design mixes Structural properties of Reinforcement, role of Reinforcement in RCC.

RCC Design: behavior of heterogeneous materials in Direct Force & Bending.
Allowable stresses in Concrete & Reinforcement.
Concept of Elastic, ultimate & unit state theory of RCC design
Idea of N,j,R, modular ratio & their values for different Grades of Concrete mix & Steel reinforcement.
Concept of limit state design & working stress design using SP-16.
Design & Detailing of RCC beams SS, Singly & Doubly Reinforced.
Introduction to L,T, rectangular Beams . Preliminary sizing of structural Elements.
(Slabs & Beam system)

UNIT - 4
Design & Detailing of RCC Slabs SS, One way & Two way.
Design & Detailing of Axially loaded RCC Columns.
Design for moment & Detailing of Isolated column footing.

Text Books:
1. Arya, A.S. and Ajmani, J.L., Design of Steel structures, Nem Chand & Bros., Roorkee
2.Jain, A.K., Reinforced Concrete- Limit State Design, Nem Chand & Bros., Roorkee
3 Arya, Design in masonry & timber structures

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Second Year**
Course Code: **ARC 241** Course Title: **Water Supply & Waste Disposal**
Number of: Lectures= **32** and Credits= **02**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
The objective of the course is to provide a wide introductory exposure to environmental support systems as they apply to human habitat, with special reference to understanding & management of various forms of water and solid waste.

SYLLABUS OF COURSE:
UNIT - 1 [Number of Lectures = 05 x 2 ___].

- Terminology used in Water supply. Introduction to domestic plumbing fixtures. Sources of Water. Distribution of Water at urban level, systems of water supply to buildings, hot water supply systems.
- Quantity of Water: Requirements of various uses. Quality of Water (No Lab. Tests to be taught).
- Primary Treatment of Water: Collection Coagulation, Sedimentation.
- Secondary Treatment of Water: Filtration. Various types of filters: Slow Sand, Rapid Sand and, Pressure filters, Clarifiers.
- Supply of Water: Materials, Joints: Advantages & Dis-advantages.

UNIT - 2 [Number of Lectures = 05 x 2 ____].

- Terminology used in sanitation and drainages. Collection & Conveyance of Refuse. Sewage Disposal at Urban level. Sewage characteristics.
- Conventional & Non-conventional methods of sewage disposal. Primary treatment of sewage.
- Secondary Treatment of Sewage using trickling. Filters, Activated Sludge Process.
- Domestic Sanitary fixtures and accessories: Traps, Gully Traps, Grease & Silt Traps, Floor/Nahini Traps, Intercepting Traps, etc.,
- Sewers: Construction & Materials,. Manholes: Construction, materials, Types, invert levels, spacing etc.,

UNIT - 3 [Number of Lectures = 03 x 2 ____].

- Introduction to design of layout plan of drains, traps, & fixtures for sanitation & drainage of a simple residential situation.

UNIT - 4 [Number of Lectures = 05 x 2 ____].

- Storm Water: Factors affecting storm water drainage: basic formulas for calculating the storm water with given storm timing and impermeability factor. [No Numerical or exercises for engineering Design of drains/storm water calculation].
- Solid Waster Management: Definitions. /Garbage/ Refuse Collection. Outline of Disposal of solid Waste: Methods of Disposal; their relative merit-demerits; Choice of disposal for Indian conditions.
- Sewage disposal through Septic Tanks & Soak Pits: System, Viability conditions, Advantages & Disadvantages.

Text Books:

1. Rangwala S.C. Water Supply & Sanitary Engineering [Environmental Engineering]. Charotar publishing House Anand, India.
2. Raju B.S.N., Water Supply & Wastewater Engineer, Tata McGraw-Hill Publishing Company Ltd., New Delhi.
3. S.G. Deolalikar, Plumbing Design & Practice, Tata McGrew Hill Publishing Company Ltd., New Delhi.
4. Pachauri, A.K., Water Supply And Sanitary Installation, Design Construction And Maintenance, New Age International ltd., New Delhi.

Reference Books: As per library catalogue

Note: In the End Term Annual Examination, Comprising of 75 marks, "Question-1" will be compulsory having short answers covering all the 'Units'. Rest any four questions will be from each 'Unit', as required to be attempted by the candidate. Only internal choice for each 'Unit' will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Second Year**
Course Code: **ARC 242** Course Title: **Energy Systems**
Number of: Lectures= **32** and Credits= **02**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
Energy Systems and Installations: To Introduce the concepts, techniques and technologies related to use of electrical energy in habitation, elementary ideas of demand generation, distribution, and costs of electrical energy, alternative energy sources like solar, wind, waves, photovoltaic. Learning numerical calculations do not form the major objective of the course. The student is expected to learn basics of the subject and how to interact with a specialist intelligently and knowledgeably.

SYLLABUS OF COURSE:
UNIT - 1 (Number of Lectures/Studios =8)
- Sources of Energy
- AC& DC
- Protection
- Transformer
- Wiring system (Batten /Conduit)

UNIT - 2 (Number of Lectures/Studios = 8)
- Conventional sources of Energy
- Non-Conventional sources of Energy
- Transmission of Electric Energy
- Star/Delta connection
- Concept of Power factor.

UNIT - 3 (Number of Lectures/Studios =8)
- Distribution system (LT) and (HT)
- Grid Stations
- Earthing
- Planning Electric Sub-Station in residential building etc.
- Safety Devices (Fuses,MCBS,ELCBS)

UNIT - 4 (Number of Lectures/Studios =8)
- Legislation and code of practice I.E. rules, National Electric code.
- Captive power generation (DG set) , UPS, Inverter.
- Lightning protection,
- Grid Stations
- Polyphase Circuit.

Text Books:
1. M.L. Anwani., Basic Electrical Engineering, Dhanpat Rai & Co. Pvt. Ltd. New Delhi.

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Third Year**
Course Code: **ARC 330** Course Title: **History Of Architecture**
Number of: Lectures= **64** and Credits= **04**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
To understand the background of present day practice of architecture with respect to significant developments in recent history- Development and diffusion of concepts and practice of Modern Architecture. Contemporary trends of architecture in India in relation to other parts of the world.

SYLLABUS OF COURSE:
UNIT - 1

- Introduction to "Modernity" "Modernization" "Modernism", Culture, Territorial & Technical transformations that let to Advent of Modern Architecture Cultural Transformation Revolutionary Visionary Architects Ledoux & Boullee.
- Technical Transformation, Industrial Revolution New Materials, Concrete, Iron & Steel and Glass. Engineers, Eiffels, Hennebique Auguste Perret, Malliart, Chicago School, Birth of Sky Skraper Architects, Adler & Sullivan
- Frank Lloyd Wright Organic Architecture, Prairie House
  Usonian House
- Art & Crafts in England, Willium Morris, Structure Rationalism & influence of Viollet Le duc
  Art Nouveu –Victor Horta, Hector Guimmard Antonio Gaudi Responses to Mechanisation
  Otto Wagner, H.P. Berlage
- Le-Corbusier & Esprit Nouveau
- Bauhaus – Walter Gropius
  Cubism De Stijl & New Conception of Space
  Mies Van Der Rohe
- Spatial Compositions & Abstract Masses
  Aalvar Aalto
  Louis Kahn
  Pluralism in the 1970s

UNIT - 2

- Late careers of Frank Lloyd Wright and Le Corbusier
- Territorial Transformations in Europe and the West Birth of New Cities and Urban Growth of cities in Europe and America. Demand for New Architecture
  Sant'Elia's –Futurism
- Intensification of Colonial Development & Architecture world wide
  Effect of Colonialism on Indian Art, Architecture & Urbanism

UNIT - 3

- Beginning of Modern Institutionalization of Architecture in India (Academic & Professional)J.J. School of Architecture, Indian Institute of Ardhitecture, Nationalist Architecture (Sirish Chatterjee etc.) Developments

- Post Independence influence of Modern Masters, Corbusier, and Kahn in India and Indian Modern Architects.
- Habib Rehman, A.P. Kanvinde, Joseph Allen Stein, Charles Correa (Early Works), Balkrishna Doshi (Early Works) PWD's early works
- Regionalism / Search for Indian Ness. Raj Rewal, Late works of Doshi, Late works of Correa also Geffry Bawa,
- Regionalism / Appropriate Technology and Sustainability Laurie Baker, Hudco and Building Centres, Lok Jumbish, Primary Education Programmes

UNIT - 4

- Globalization and its impact on India, Rise of Indian and Multi-National corporations and their architecture, Advent of new building types – offices, malls, Cineplex, Super Deluxe Hotels, Satellite towns Gurgaon, New Bombay, NOIDA etc. (Architecture only). DLF and Hafeez Contractor, The Contemporary Individual Urban Residence in Delhi..
- Elementary Reference to Post- Modernism in the west, Works of Venturi, Rossi, Michel Graves Eisenman Tschumi etc Contemporary works in the west

Text Books:

1. Lang, Jon, Madhavi Desai & Mili Desai (1997) Architecture and Independence; The Search for Identity – India 1880 to 1980, Oxford University Press (Selected Portions only)

Reference Books:

2. Correa, Charles M (1985) The New Landscape. Bombay Strand Books.
3. Bagha, Sarabjit, Surinder Bagha and Yashinder Bagha (1993) Modern Architecture in India, New Delhi: Galgotia Publishing company.
4. Bhatia, Gautam (1994) Punjabi Baroque and other Memories of Architecture, New Delhi, Penguin Books.
5. Bhatia, Gautam (1994) silent Spaces and other Stories of Architecture, New Delhi, Penguin Books.
6. Architecture of India, Electra Montier Publication on Festival of India in France.
7. Bhatt, Vikram and Peter Seriver (1990) Comtemporary Indian Architecture: After the Masters, Ahmedabad.

Note: In the End Term Annual Examination, Comprising of 75 marks, "Question-1" will be compulsory having short answers covering all the 'Units'. Rest any four questions will be from each 'Unit', as required to be attempted by the candidate. Only internal choice for each 'Unit' will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Third Year**
Course Code: **ARC 331** Course Title: **Settlements Design**
Number of: Lectures= **64** and Credits= **04**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
To understand the city as a large system composed of physical components such as circulation networks, districts, open spaces and its delimiting legal edge. How these components have emerged, transformed and sustained their character in settlements under varying conditions in the course of history. With the understanding of city and its components, the modern planning process as applied to a settlement is studied. The course culminates in case study of master plan and its objectives as applied to a settlement.

SYLLABUS OF COURSE:
UNIT - 1 (Number of lectures 07)

- City as an architectural form. Tools to Understand city form-street system, land use pattern, the building fabric. Early City form. Factors influencing the formation of cities topography religion, politics, Social and political needs.
- Early Greek cities. Principles of planning set up by Hippodamus. Case Examples of Priene and Miletus. Planning concepts of Hellenistic Greek cities. Early Roman City. Planning concepts followed in roman military camp towns. Terms-Decumanus, Cardo, Lugera. Roman Cities of Timgad and Pompeii
- Vedic city diagrammes. Town planning concepts for Indian cities with case examples
- Medieval towns of Europe. Influence of Castle, Church and Guilds on town. Medieval Towns of India. Study of planning principles with case examples of Madurai, Srirangam and Jaisalmer.

UNIT - 2 (Number of lectures 07)

- Renaissance cities of Europe. Understanding city planning principles with case examples of Versailles, karlsruhe etc. Influence of Renaissance and Baroque city Planning concepts on contemporary cities of the world with examples of Washington and New Delhi.
- Modern Planning theories of early 19th century of Patrick Geddes Ebenezer Howard Radburn and Henri Wright
  Neighbouhood Planning Concept

UNIT – 3 (Number of lectures 07)

Introduction to City as a Physical system & Components of City.

- Contemporary City and its Physical Components. City as a large system. Image structure of city of Kevin Lynch , with examples from India and abroad.
- Circulation network as structuring element in a settlement. Street types- waterways covered streets, bridge streets, boulevards etc. relation of built mass vs. street, street as a seam, elements of street- porticoes, gateways, fountains, etc. street as a public space**.**
  - Modernist street, street as a divider, visual variety & spatial enclosure, building line, hierarchy of roads in Delhi Master Plan.

- Central Elements of City- The Administrative District, The Religious District, The District of Business and Commerce, Residential component- traditional *mohallas* and modern neighborhoods.
- The City Edge- Legal limits of a city, its need and role throughout history –ritualistic boundary, customs boundary, etc. Types of city edges – walled, water front, multiple edge, open city industrial extensions, suburbs, green belts. Controls at city edge.
- Open spaces within a city- green/parks& gardens and paved/ plazas/ *maidaans*. Modern space hierarchy within a city.

UNIT - 4

- Site planning, analysis and design; Off-site and One-site factors; Site plan process; Typical street layout in residential planning; General street classification (reference to Delhi Master Plan).

- Traffic and circulation: objective and purpose.

- Architectural Controls, Urban Renewal, Re-development, Revitalization.

Text Books:

1. Good City Form by Kevin Lynch, The City shaped by Spiro Kostof Urban Pattern by Arthur B. Gallion. The City Assembled Spiro Kostof,
2. The Text Book of Town Planning by Abir Bandyopadhyay,

Reference Books:

1. The Architecture of the City -Aldo Rossi. The Death and life of Great American Cities- Jane Jacobx. A reader in Planning Theory- Andreas Faludi. The Urban Pattern Arthur B. Gallion.

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Third Year**
Course Code: **ARC 340** Course Title: **Theory of Structures**
Number of: Lectures= **128** and Credits= **08**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:

The objective of the course is to develop a feel for structural principles as they relate to a building design, to enable him to make an informed choice regarding the most appropriate structural system for this building and to develop a reasonable understanding of its operational and economic implications.

SYLLABUS OF COURSE:

UNIT - 1

Deflections

Demerits, Nature, Causes, Limits.
Formulas for determinate structures for concentrated & uniformly distributed loads.
Fixed , SS beams & continuous beams. Degree of indeterminacy, deflected shapes . Nature f SFD & BMD
Fixed End Moments .: Due to sinking of supports.
Introduction to stiffness, Relative stiffness.
Carry over factors, Distribution factor , Moment distibution method.
Analysis of continuous beams by MDM for vertical loads only.
Portal frame Analysis by MDM for vertical loads only.

UNIT - 2

Soil Mechanics: Introduction, classification of soils & their characteristics.

Soil Investigation
Concept, need , testing is of two types standard penetration & plateload .
Foundation Systems
Types & feasibility criteria.
Permissible values, differential settlement.
Isolated, Combined, Raft & Pile foundation.
SBC of soil.
Retaining walls: Introduction, expression for finding earth pressure RCC & Masonry Retaining walls

UNIT - 3

Loading assessment

Design load codes applicable in India & Introduction to Horizontal Loads.
Preview of Dead loads & Live loads.
Calculation of DL+LL in a BLDG.
Earth quake loads.
IS-1893-1984
Bhuj Earth Quake
Calculation of Earth Quake
Load on a BLDG

Introduction to wind loads
IS 875-III
Calculation of wind loads for simple building.
Analysis of structure
Using MDM, Method for simple portal & cont Beam.
Approximate method of Analysis for simple portal under lateral loads.

UNIT - 4
Introduction to computer Analysis of simple strs using STAAD
Input file generation & output file interpretation of results.
Floor systems Beam –Slabs, Flat slabs, Flat plates
Floor systems waffle slabs
Grid floors
Sizing of strl systems
Framing systems RCC frames
Shear walls & Frames
Along with Shear walls
Concept of moment design and detailing of continuous beams
using SP-16 & SP-34
Introduction to concept of Ductility & Ductile Detailing of Strs for seismic effects.

Text Books:
1 Jain,A.K., Elementary Structural Analysis, Nem Chand Bros. Roorkee.
2 Jain, O.P. and Jain B.K., Theory of Structures, Vol. 1, Nem Chand Bros. Roorkee

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, "Question-1" will be compulsory having short answers covering all the 'Units'. Rest any four questions will be from each 'Unit', as required to be attempted by the candidate. Only internal choice for each 'Unit' will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Third Year**
Course Code: **ARC 341** Course Title: **Quantities, Specification, Estimation & Contracts**
Number of: Lectures= **64** and Credits= **04**
Syllabus effecti ve from: **August 2005**

OBJECTIVE OF COURSE:
Teaching basic concepts of preparation of quantities and estimates measurement of building works, writing of specifications and preparation of Contract documents for small works.

SYLLABUS OF COURSE:
UNIT - 1
- Area calculations: Types of areas taken for estimation plinth areas, plot area, built up area, covered area etc.
- Different types of estimates of be prepared. Preliminary estimates, detailed estimates etc.
- Methods of taking out quantities, width, length and depth calculations by long wall & center line methods. Units of different items, for quantity estimations.
- Modes of measurement of works on site. Measurements methods of various items, deductions for opening etc. Addition of wastages to the measured quantities.

UNIT - 2
- Specifications: Definitions, importance, composition of speces, Broad classification of speces, role in a contract document.
- Open, restricted speces. Advance & disadvantages of each Standard, special master speces.
- Nature, advantages & disadvantages of each.
- Streamlined speces – Nature, advantages & disadvantages of each. Types of Technical Speces and provision of each. General provision of speces- Definitions abbreviations.
- Legal + public relations, prosecuting progress, measurement + payment. Specification writing – format style, principles of good speces, merits and demerits.
- Scheduled and non-scheduled items, CPWD speces for carriage of materials, CPWD speces for mortars, CPWD speces for brick work, CPWD speces for concrete, CPW D speces for flush doors, CPWD SPECES FOR WHITWASH, DISTEMPER, CPWD speces for synthetic paint.

UNIT - 3
- Preparation of preliminary and detailed estimates working out estimates for a buildings whose plans, section and elevations are given.
- Working out cost of construction based upon the plinth area rates, covered area rates etc.
- Rate analysis of various items concrete, RCC brickwork etc. using the market rates CPWD (97) of materials and labor.
- CPWD schedule of rates latest edition of 1997. Rates as given in schedule to be used as guidelines for making estimates.
- Use of computers for generating BOQ.
- Calculates the cost of the building based on the market rates and working out the rat per sq.mtr. area of the building.

UNIT - 4

- Contract: Contractor – definition, essential's types of contracts: Types of contracts: Item rate, percentage rate, Advantage & disadvantages of each.
- Types of contracts: Lumpsum, labour, materials supply-nature advantages and disadvantages. Types of contractor- cost+ percentage, Cost + fixed fee, other types. Advantage & disadvantages.
- Tender, forum, N.I.T, examples, Global tender, sale, opening, Corporative statement, informal tenders.
- Conditions of agreement and contract: Acceptance of tender, contract DOX, Earnest Money, Security Money Retention Amount, other important conditions.
- Duties of owner, Contractor & liabilities of each.
- Duties of the Architect/ Engineer and his liabilities w.e.f. the contract.
- Case studies of recent Arbitration in the Industry, Duties of Contractor & liabilities.

Text Books:

1. Dutta B.N., Estimating and Costing in Civil Engineering, UBS Publishers Distributers Ltd, New Delhi.

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, "Question-1" will be compulsory having short answers covering all the 'Units'. Rest any four questions will be from each 'Unit', as required to be attempted by the candidate. Only internal choice for each 'Unit' will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Third Year**
Course Code: **ARC 342** Course Title: **Lighting & Acoustics**
Number of: Lectures= **32** and Credits= **02**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
To acquaint the students about light and sound theory and their application to building design.

SYLLABUS OF COURSE:
UNIT - 1

- Day lighting : Physical parameters of day lighting Day light penetration: Day light factor
- Integrating day lighting with artificial lighting; automatic control of artificial lighting in relation to day lighting calculation of requirements of artificial lighting in relation to availability of day lighting.
- Type of lamps: In incandescent lamp: Reflector lamp, Blown bulb lamps, Tungsten Halogen lamp, Tubular fluorescent lamps, Mercury vapour lamps Sodium vapour lamp, Compact Fluorescent lamp.

UNIT - 2

- Vocabulary of artificial lighting: Lumens; lux; M.F; R.I.R. lighting level requirement for various areas.
- Type of luminaries – Decorative commercial, Industrial, outdoor- Working out of Room Index Ratio and Coefficient of utilization.
- Design of artificial lighting for various types of buildings.
- External lighting: lighting for various types of buildings.

UNIT - 3

- Acoustical concepts- wave theory, sound power, sound intensity, decibels, sound power level, sound intensity level, sound pressure level, frequency bands concept of reflection, absorption, transmission.
- Absorption coefficient, NRC, sound absorbing materials,-fibrous, membrane, resonators, perforated facing, application techniques.
- Noise control by absorption, sound transmission, transmission loss, composite barriers, noise reduction between rooms, light construction.

UNIT - 4

- Reverberation time (RT), calculation of RT, sample problems, RT and noise criteria for spaces for speech and music.
- Acoustical design of enclosed spaces for speech and music, reflection analysis reflection/diffusion, echoes, flutter echo, foci.
- Acoustical design consideration in interior design and sound amplification system.

Text Books:

1. David, E., Architectural Acoustics
2. Narsmhan, An introduction to Building Physics.
3. Services and Environmental Engineering, BRE Digests.

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Third Year**
Course Code: **ARC 343** Course Title: **Mechanical Ventilation Communication, Security & Safety**
Number of: Lectures= **32** and Credits= **02**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
The course aims at exposing the architecture students to the areas of air conditioning, general utilities in buildings, present trends of fire protection in security systems.

SYLLABUS OF COURSE:
UNIT - 1
- Introduction to Air Conditioning, Sensible heat, Latent heat, Specific Humidity, Relative Humidity, Ton (TR)
- Refrigeration Cycle, Understanding Principles of Air-conditioning.
- Heat Load Estimation, Understanding constituents of heat load calculations like wall, glass, roof, partition equipment, fresh air, lighting & occupants (Mathematical calculations are excluded).
- Non-Ducted System (Window Units & Split Units), Construction details, installation practices & application.
- Ducted systems (splite units & package units), Construction details, installation practices & application.

UNIT - 2
- Direct Expansion and Chilled Water Systems. Types of compressors air-cooled & water cooled condensers, introduction to cooling tower air handling unit, fan coil unit, pumps, Hot water generator and chilled/ condenser water piping.
- Brief introduction to variable air volume water volume and vapor absorption system.
- Fresh Air, Sick building syndrome, Indoor air quality and importance of fresh air.

UNIT - 3
- Application, Brief introduction to air conditioning system design in hotels, Hospital and commercial buildings.
- Ventilation Systems, Basement ventilation, Car park ventilation, Toilet/pantry ventilation, Introduction to air-cooling system.
- Building Automation Systems,Introduction: System architecture, sensors, controllers, energy management functions, (duty cycling, night cooling, time scheduling, optimum start/ stop, maximum demand limiting etc., Application, future trends.
- Elevators, Introduction, passenger lift, goods lift, service lift, hospital lift, waiting time analysis and introduction of IS codes

UNIT – 4
- Triangle of fire, Materials to be used in construction, Staircases, Fire escape distances for different buildings, Fire spread in Buildings, Fire doors, Basements, Lifts, Electrical Sub-station, AHU Shut off, NBC Rules for fire.
- Fire safety standards and requirements for various types of Buildings.

- Fire alarm system and components, Hydrant System and Components, Pump house and location.
- Wet riser system, Down comer system and Sprinkler Systems for fire Fighting services.
- Security System, Access Control System, Intruder detection and CCTV systems.

Text Books:

1. Carrer and Pitam, G. Modern Air-conditioning, Healing and Ventilation
2. Servems and fellows, Air-conditioning and ventilation, John Wiley
3. Strakosch, Elevators and Escalators, John Wiley

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, "Question-1" will be compulsory having short answers covering all the 'Units'. Rest any four questions will be from each 'Unit', as required to be attempted by the candidate. Only internal choice for each 'Unit' will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Fourth Year**
Course Code: **ARC 430&530** Course Title: **Town Planning**
Number of: Lectures= **32** and Credits= **02**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:

This course is especially designed for architecture students. It is viewed and taught from an architect's view point rather than from a planner's viewpoint. The intention is to make architecture students ware of the problems of cities and how to address these various problems. The course focus is on the physical and spatial aspects of planning of cities. In doing so, a number of city spaces, their form and structure and annualized. How have these being affected because of out population, housing shortage, infrastructure and related problem

SYLLABUS OF COURSE:

UNIT - 1

- Planning defined; Principles of planning; planning as a team work; the road contribution of an architect to planning as a member of the planning Team.
- Interrelation of Architecture, Urban Design and Planning with focus on broad planning issues.
- City Planning process.
- Environmental problems of cities; Role of architect
- Annualizes of the design qualities of cities (Urban spaces in particular); How these spaces, city structure and form have been affected due to population growth, housing shortage and other reasons.

UNIT - 2

- Definition and understanding of basic terms such as Density, FAR,FSI & their significance in planning and determining the urban form.
- Master plan; structure plan; Zonal Plan: Land use plan , Zoning; development zones and planning division; Hierarchy in urban development. Concept of Building Bye Laws
- Growth pattern of cities; Ring Towns and Satellite Towns (Context to Delhi Master Plan).
- The Neighborhood Unit: Residential Planning; Road layout; design consideration of sub-division layouts; Groups housing regulation and standards.

UNIT - 3 (Number of lectures 07)

- Types of planning. Problem identification (goal formation), surveys and investigation, analysis, development of alternatives, selection of alternatives, implementation, monitoring and feedback.
- Surveys – types, techniques of surveys, scales of questionnaires, errors in surveys. Town and its land uses, standard urban areas, terms such as – density, occupancy, accommodation density, F.S.I., FAR, TDR etc.
- Zoning – concept, objectives of zoning, types of zoning,
- Difference between zoning and building bye-laws. Prerequisites of zoning bye-laws. Land use classification in a city.
- Master plans and land uses-principles for preparing master plans. Implementation machinery for master plans. Political pyramid of master plans. Failure of master plans. Structure plans. Regulation plan
- Delhi master plan. Its aims,its concept, salient features, zonal development plans. Regional and sub regional frame of Delhi Master Plan- NCR, DMA. Components of Plan.

UNIT - 4

- Housing as basic fabric of Town Plan. Housing Policy elements and their integration in town plan. Introduction to concept of housing shortages and supply systems and role of Architects with focus on needs of non-formal and weaker sections of population.

Text Books:

1. Kebble, Principles and practice of Town & Cuntry Planning
2. Town Planning by Modak
3. Delhi2001 Delhi Vikas Varta a house journal of DDA special issue 1985

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Fourth Year**
Course Code: **ARC 440&540** Course Title: **Structural Systems**
Number of: Lectures= **32** and Credits= **02**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
To understand concepts and application scopes and limitations. No detail designs but overall understanding of systems and factors.

SYLLABUS OF COURSE:
UNIT - 1
Shells: General understanding of shell behaviour Historical perspective Modern day use, thick shell thin sell, membrane stresses in thin shell, geometry of shells, of and Meridian stress.
Plates and Grids: General understanding of structural behaviour of plates and grids, one and two way action, grid floor, rectangular and skew grids, T-beam action, filler slabs, Examples of modern day use.

UNIT - 2
Folded Plate: General understanding of folded plate, Folded plate as a form-active system, Design of cross-sectional dimensions of folded plate, ferrocement as a material for folded plate construction, examples modern day use.
Vierendeel Girder: General understanding of vierended girder as an architectural and structural element Design of cross-sectional dimension of vierendeel girder, examples of modern day use.

UNIT - 3
Space Frame: General understanding of structure of space frame, space structures against plane structures, examples of modern day use.
High Rise: Principles of high rise structures, different structural systems for high rise buildings, advantages and disadvantages of each, analysis of multistory frame for wind had, examples of modern day use.

UNIT - 4
Tensile Structures: Principles of tensile structures, understanding general structural behaviour of tension systems, calculating sag and cross sectional area of cables, cable suspended and cabled-stayed structure, examples of modern day use.
Introduction to Prestressing: Principles of prestressing, p and pot tensioning, approximate calculations of prestressing force, examples of modern day use
PreFab and Industrial structures.

Text Books:

1. Structures in Architecture by Mario Salvadori,
2. Nervi, P. L. Structure

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given

Name of University: **GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI**
Name OF Program: **Five Years B.Arch** Year: **Fifth Year**
Course Code: **ARC 570** Course Title: **Professional Practice & Contract Management**
Number of: Lectures= **64** and Credits= **04**
Syllabus effective from: **August 2005**

OBJECTIVE OF COURSE:
Familiarise students with the legal, economic and social issues related to professional practice. Focus will be on the role of the architect in a developing society and the emerging influence of economic liberalisation. Emphasis will be on the ethical dimension governing professional conduct in serving the client/society.
The architect and his office, job organization, presentations, business management, sales promotion, human relations and personnel management. Design Audit procedures, Efficiency studies and performance appraisal, billing, accounting, business correspondence, information storage and retrieval.

SYLLABUS OF COURSE:
UNIT - 1
- Architect & His Office, Responsibilities, Office Management, Project Co-ordination Clients, Consultant and Project Managers, Office Accounts and Billing.

UNIT - 2
- Design Audit & Efficiency Studies, Analysis for Special Efficiency of Buildings.
- Office Automation Information Storage and Retrieval.

UNIT - 3 [Number of Lectures/ Studios =8]
- Understanding who is a professional and why architecture is considered a profession.
- Relation ship with clients consultants, clients.
- The architects Act 1972. Process of Registration.
- Rules, Regulations and guidelines of council of Architecture. Code of professional practice, Fees, Agreements and contracts.
- Role of professional bodies and institutions.
- Indian Institute of Architecture.
- Influence of WTO and GKTTS
- Economic reality of practicing the profession in India.

UNIT - 4 [Number of Lectures/ Studios = 4]
- Conditions of Engagements and Professional liability and indemnity.
- Architect – The leader of the Team.
- Architecture competitions and getting work.
- Negotiation and Arbitration. Indian Arbitration Act.
- Contemning Education and Research.
- Architectural Education and the Profession.
- Group discussion on case studies-1.
- Group discussion on case studies-2.

Text Books:

1. Handbook of professional Documents published by the Council of Architecture.
2. Professional practice by Roshan Nanavati (Available in the Library).
3. Archilchwalp practice in India by Madhav Deobhakta (Available in the Library).

Reference Books:

Note: In the End Term Annual Examination, Comprising of 75 marks, “Question-1” will be compulsory having short answers covering all the ‘Units’. Rest any four questions will be from each ‘Unit’, as required to be attempted by the candidate. Only internal choice for each ‘Unit’ will be given