RAJIV GANDHI PROUDYOGIKI VISHWA VIDYALAYA, BHOPAL (M.P.)

SCHEME OF EXAMINATION - BACHELOR OF ARCHITECTURE

SECOND YEAR – FOURTH SEMESTER

S. No.	Subject Code	Subject Name	Maximum marks allotted					Teaching hours per week			Total credits	Exam Duration
			Theory			Practical		Lecture (L)	Tutorial (T)	Practical/ Studio (P/S)		
			END SEM	Mid sem test	Quiz	End Sem	Studio work/ Sessional					
1	AR_ 221	Design- IV	50	30	20	50	150	2	-	6	8	12

AIM : Study of natural environmental factors, their impact and consideration by human settlements of a town on a part of a city. Especially on housing forms, open spaces, their activities and construction methods including energy efficient structures. Emphasis on the following attitudes is important :- Detailed study of one or more of the following aspects - climatic considerations and relationship with life style. Emphasis on Consideration of constructional details, basic details of services like kitchen, toilets etc. and site planning of the scheme. Design problems with natural and manmade parameters dealing with independent bungalows, farm houses, combined units, duplex type their cluster or grouping etc. along with relevant Building codes.

There should be minimum one time problem of 12 hrs. duration apart from regular design problems in the studio.

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Note: The sessionals will be in the form of drawings and models along with technical report for the design dealt with. The evaluation should be done in intermediate review consisting of internal and external experts. There should be regular site visits to the building types dealt in the studio problems of which audio-visual should be prepared.

LIST OF TEXT AND REFERENCE BOOKS:

1. "Planning by E. & O.E". Lliffe book Ltd., London.
2. D.E. CHIRAIRA & CALLENDAR, "Times Saver Standard for Building Types".
3. RUDOLF HERGE, "Nuferts Architects Data", Cross By Lockwod & Sons Ltd.
4. EDWARD D. MILLS, "Planning the Architects Hand Book".
5. National Building Code.

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2	**AR _222**	**Building Construction – III**	**50**	**30**	**20**	**50**	**100**	**2**	**-**	**4**	**6**	**3**

1. Shoring – Types (Raking, Flying & Dead) and detailing
2. Industrial steel floor (fire proof), stone slab roofing, stone roof on girder, stone stairs.
3. Steel roofs-types and detailing of short span (upto 6M) trusses only
4. Precast components (C.B.R.I.)for partitions, column ,beam and slab
5. Design & construction details of domestic furniture in timber & hollow tube sections.

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Note: i) There should be regular site visits to buildings under construction or constructed to explain the above topics. Use of audio-visuals should be stressed.

ii) Minimum 8 sheets shall be prepared out of which two may be in sketch form (scaled).

LIST OF TEXT AND REFERENCE BOOKS:

1. W.B. MCKAY, “Building Construction Vol.1to IV, Orient Longman.
2. R. CHUDLEY, :Building Construction Handbook Vol. 1 to 4 “British Library Catalouging in Publication Data 1990.
3. DR. B.C. PUNAMIA, “Building Construction”, A. Sauraby & Co. Pvt. Ltd.
4. R. BERRY, “Construction of Buildings”. The English Language Book Society London 1976.
5. MITCHEL, “Advance Building Construction”, Allied Publishers Pvt. Ltd.

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3	**AR _223**	**Building Services - I (Sanitation & Plumbing)**	**50**	**10**	**10**	**-**	**10**	**2**	**-**	**1**	**3**	**3**

A) SANITATION

1. Basic principles of sanitation, introduction to modern plumbing system. Study of Indian standards and plumbing bye laws. General introduction to various sanitary fitting & fixtures their placement and functions. Study of internal & external drainage system including study of duct for large verity of buildings including small residences, apartments, block of houses, public buildings etc.
2. Study of various types of sanitary pipes, construction of joints and laying of pipes. Study of traps, inspection chamber, man hole, septic tanks, soak pit and public sewage line. Study of various stages of disposal of domestic effluent from fitting to sewer line. Study of "Sulabha" complex & other "CBRI" toilet details. Study of storm water disposal in various buildings and road side.
3. Importance of sanitary services in the economics of buildings, planning & design disposal of city effluent, various treatment methods of city effluent and recycle of waste water. Study of refuse chutes in multistoried buildings and collection of refuse and recycle of city solid wastes.

B) PLUMBING:

1. Study of sources of water and water treatment for city domestic purpose. Study of quality of potable water.
2. Study of Indian standards and water supply network. Architectural approach to plan the domestic water storage facilities and water distribution system in buildings.

Note: Sessional will be prepared in the form of sanitation schemes, water supply schemes and design of toilets of the given buildings or buildings.

LIST OF TEXT AND REFERENCE BOOKS:

1. RANGWALA, "Water Supply and Sanitary Engineering", Charotar Pub.
2. BIRDIE, "Water Supply and Sanitary Engineering", Dhanpat Rai & Sons.
3. W.B. MCKAY, "Building Construction", Orient Longman.
4. "Handbook on water supply and drainage", Bureau of Indian Standards.
5. R. BERRY, "Construction of Buildings. Vol-5", Elbs. Pub.

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4	**AR_ 224**	**Structure-IV (R.C.C.)**	**50**	**10**	**10**	**-**	**10**	**2**	**1**	**1**	**4**	**3**

1. Introduction to R.C.C., Working Stress method, Limit State method
2. Design of Beams :- analysis of beams, design of singly, doubly reinforced beam, T-beam, L-beam, (cantilever and simply supported) lintel, chhajjas
3. Design of Slabs :- analysis of slabs, design of One way, Two way, Continuous, Cantilever Slabs (simply supported and continuous)
4. Design of Columns:- axially loaded, columns with Uni-axial and Bi-axial bending
5. Design of Staircases :- dog-legged, and open well only

Note: Sessional work should include the analysis of simple elements along with the drawings.

LIST OF TEXT AND REFERENCE BOOKS:

1. RAMAMURTHAN, “Theory of Structures”, Dhanpat Rai & Sons.
2. DR. B.C. PUNAMIA, “Strength of Materials & Theory of Structure Vol.2”, Laxmi Pub.
3. JINDAL, “Indeterminate Structure”.
4. SOLOMAN, “R.C.C. Vol.I”, CBS Publishers.
5. SUSHIL KUMAR, “Treasure of R.C.C”

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5	**AR _225**	**History of modern Architecture**	**50**	**10**	**10**	**-**	**10**	**2**	**1**	**1**	**4**	**3**

1. Studies of folk art and crafts, indigenous architectural studies, influence of tradition, culture and socio-economic developments on art and architecture. Introduction to inquiries initiated by various Western and Indian philosophers.
2. Understanding of determinants of physical form such as concepts of space, structure, organization, symbolism, mass, surface scale, order, proportion, rhythm, datum, axis, etc. in relation to place, time and society with due consideration for perceptual qualities as affected by colors, light conditions, vision angle etc.
3. Communication and interpretations in architecture. The eloquence, aptness and style in architecture, their judgment and design.
4. Development in world architecture, environmental design and technology with reference to trend setting works of architects, designers, ecologists, engineers etc.
5. Design parameters, principles, process, methods and program formulation. Design, matrices and system integration. Process of design synthesis.

Note: The sessional should be in the form of drawings technical report writing and presented in the seminar along with the audio visuals which will be based on buildings identified during regular site visits.

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LIST OF TEXT AND REFERENCE BOOKS:

1. JOHN RUSKIN, “Seven Lamps of Architecture”.
2. MAITLAND GRAVES, “The Art of color and Design”, McGraw Hill book Co. INC.
3. BAHGA, “Modern Architecture in India”, Galgotia Pub.
4. FRANCIS D.K. CHING, “Form, space and order”, Van Nottrand Reinhold Co. Canada.
5. CHRISTOPHER ALEXANDER, “Pattern Language”, Oxford University Press.
6. Leland M. Roth, “Understanding Architecture”, Craftsman House.
7. CHRISTOPHER ALEXANDER, “Pattern Language”, Oxford University Press.
8. FRANCIS D.K. CHING, “Form, space & order”, Van Nottrand Reinhold Co. Canad

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6	**AR_226**	**Landscaping & Site Planning**	**50**	**-**	**10**	**50**	**20**	**1**	**-**	**3**	**4**	**3**

AIM: The objective of this subject is to introduce students about site planning and landscape architecture i.e. about the natural and manmade environment, thereby enhancing the outdoor environmental quality in architectural design. This course intends to develop an understanding of Site Planning and landscape architecture to compliment architectural design

LANDSCAPE DESIGN

1. Definition of landscape, its scope and importance in architecture and planning Levels of landscape planning.
2. Brief outline of development of gardens in history. The principles and design philosophy of Mughal & Japanese gardens with examples.
3. Landscape design process, information needed for landscape survey. Land, water & plants as landscape elements, their functional & aesthetical considerations in landscape design. Man made elements in landscape design-lamp posts, sign boards, garbage bins, fences etc.
4. Grading its importance, grading process & methods of estimating earth volumes. Slopes for various outdoor functional activities. Surface runoff calculations & design of surface drainage system. Treatment of ground surfaces, kinds of paving materials.
5. Planting Design-Understanding plant material as a design tool. Design characteristics of plants. Selection of plant materials for road side plantation, court yards, parking areas, near water bodies indoor areas etc. Details of establishing & grass lawn. Fertilizers their types & uses.

SITE PLANNING

1. Site planning, its interpretations, scope its importance Natural & Man made environment. Ecosystem, Ecological balance, interaction between built environment & ecosystem Ecological approach to design.
2. Natural Resources, Land, Water & Plants their environmental & ecological considerations.
   Macro & Micro climate, Microclimatic analysis, climatic Elements & their modification.
3. Site selection criteria, site survey, inventory & analysis, site planning process. Site development, guidelines for excavation & grading, circulation, site drainage, water supply, vegetation cover & Landscape furnishings.
4. Circulation systems: Types, hierarchy & layout patterns, planning & design criteria for pedestrian movement, vehicular movement & parking areas.
5. Buildings & outdoor spaces, their relationship & composition, Elements of visual design- point, line, form, colour & texture. Site Volumes, enclosures, site structure expression.

Note: Sessional shall be prepared in the form of notes and calculations, drawings etc. as per above topics.

LIST OF TEXT AND REFERENCE BOOKS:

1. J.O.SIMMONDS, “Architecture, A manual of site planning and design”, McGraw Hill.
2. “Time Saver Standard for Site Planning”
3. R. JENE BROOKS, “Site Planning”, Princeton Hall.
4. J.O. SIMMONDS, “Introduction to Landscape Design”.
5. J.O. SIMMONDS, “Earth Scape”
6. “Water Scape”
7. BOSE & CHOUDHARY, “Tropical Garden plants in color”, Horticulture & Allied Pub.

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6	**AR_227**	**Ecology and environment**	**50**	**10**	**10**	**-**	**10**	**2**	**-**	**1**	**3**	**3**

Subject Objective: To introduce the basics of environmental science and its relevance to mankind, the built envelop around.

Introduction:

Structure and Function: Introduction to ecology, its importance in daily life.. Fundamental concepts of ecology. Ecology – Environment relationship. Structure and function of eco- systems(Grassland, Desert, Aquatic and Forest).

Bio-diversity and its conservation

Value of bio-diversity - consumptive and productive use, social, ethical, aesthetic and option values. Bio- geographical classification of India – India as a mega diversity habitat. Threats to biodiversity-Hotspots, habitat loss, poaching of wildlife, loss of species, seeds etc. Conservation of bio-diversity, in-situ and ex-situ conservation.

Environmental impacts

Environmental impacts of Industrial activities, urbanization, de-forestation, mining and similar incursions on nature for technological progress. The ecological crisis. Relevant case studies from abroad and India

Social issues and Environment

Social issues and the environment, from unsustainable to sustainable development, urban problems related to energy; human population and environment- population explosion, resource exploitation and depletion, human-wild conflict, loss of wet lands, mangroves, increasing desert areas, spread of diseases.

Institutions and Governance

Introduction to Government regulations, Monitoring and enforcement of environmental regulations, Introduction to Environmental Acts, viz., Water (Prevention and Control of Pollution) Act, Air Prevention and Control of pollution act, Environmental Protection Act, Wild life protection Act, Forest Conservation Act, etc.

Note: Sessional shall be prepared in the form of notes etc. as per above topics

LIST OF TEXT AND REFERENCE BOOKS:

1. Fundamentals of Ecology by E.P. Odum
2. The Ecology of Man: An Ecosystem Approach by Robert Leo Smith
3. Introduction to Ecology by Kurmundi
4. Review Our Dying Planet by Sarala Devi
5. Modern Concepts of Ecology by H.D. Kumar
6. Environmental Biology by Agrawal, K.C.(2001).
7. Environmental Studies New Delhi: Tata Mc Graw Hill by Benny, J.(2005).
8. Text book of Environmental Studies b yBharucha, E (2005).
9. Hazardous waste incineration. New Delhi:Mc Graw Hill by Brunner, R.C. (1989)
10. Basics of Environment and Ecology by Kaushik A and Kaushik ,C.P.2010