Faculty of Engineering & Technology

Structure & Syllabi for Forth year of

ARCHITECTURE

(Effective from A.Y.2005)

॥ अंतरी पेटवू ज्ञानज्योत ॥

NORTH MAHARASHTRA UNIVERSITY, JALGAON

344
29/4/2005

North Maharashtra University, Jalgaon

Fourth Year Architecture (B.Arch.)

Term -I

Sr. No.	Subject	Teaching Scheme				Scheme of Examination		
		Lectures	Tutorial	Studi	Total	Paper	Sectional	Total
1	Structure-VII	3	1	-	4	100	50	150
2	Housing	3	1	-	4	100	50	150
3	Rural Architecture	3	1	-	4	50	50	100
4	Project and Construction Management	2	1	-	3	-	50	50
5	Quantity surveying and estimating-II	3	1	-	4	100	50	150
6	Architectural Design-V	-	-	9	9	100	200	300
7	Building construction-V	-	-	6	6	100	150	250
8	Interior Design	-	-	3	3	100	100	100
9	Computer applications	-	-	3	3	-	50	5-
	Total	14	5	21	40	550	750	1300

North Maharashtra University, Jalgaon

Fourth Year Architecture (B.Arch.)

Term -II

Sr. No.	Subject	Teaching Scheme				Scheme of Examination			
		Lectures	Tutorial	Studi	Total	Paper	Sectional	Total	D
1	Appropriate technology	3	1	-	4	100	50	150	
2	Professional practice-I	3	1	-	4	100	50	150	
3	Contract document and building byelaws	2	1	-	4	50	50	100	
4	Building economics	2	1	-	3	50	50	100	
15	Elective-II	2	1	-	3	-	50	50	
6	Architectural Design-VI	-	-	9	9	100	200	300	
7	Building construction-VI	-	-	6	6	100	150	250	
8	Architectural conservation project	-	-	5	5	-	150	150	
9	Computer applications	-	-	3	3	-	50	50	
	Total	**12**	**5**	**23**	**40**	**500**	**800**	**1300**	

FACULTY OF ENGINEERING

FIFTH YEAR DEGREE COURSE IN ARCHITECTURE

FOURTH YEAR B. ARCH

[TERM- I]

01. SUBJECT: STRUCTURE – VII

1. Compare betn working stress mathode and limit state methode.
   Prestress concrete, methods, methods of prestressing, losses in prestressing.
   Advantages and disadvantages, findout stresses in extreme fibre [problem]
3. Desinging lacing column, with foundation slab.
4. Design batton column with foundation.
5. Design purlin or truss design inconnection with wind load.
6. Theory
   Flat Slab
   Folded Plate
   Design dome & Shell
   Indian Std . Specification for various Bldg.alements.

   Factory building, Crane Purpose, Gantry gurder.
   Introduction to computer in structures analysis and design
   [short notes]

02. SUBJECT: HOUSING

The study aims at introducing students to the development of planning thought from that of historic to present age. It also gives emphasis on tracing broad principles of settlements in such period. The study of this subject continues with emphasis on planning philosophies and the student to carry out the further studies in the specialized field of housing or urban planning.

PAPER – 100 MARKS LECTURE – 03 /WEEKS
SESSIONAL - 50 MARKS TUTORIALS- 01/WEEK

1. Pre –historic, Vedic, Buddhistt, Mugal, and British planning in India and planning after Independence.

2. Concept of urbanization it's issue, techniques of urban design and relation with urban planning.

3. Pioneers, their works and planning concepts such as Ebnezer Howard, Patric Geodes, Le-crosier etc.

4. C.A. parry's Neighborhood concept- Neighborhood an urban planning module, study of urban infrastructure- land user transportation and other services and open spaces with public utility areas.

5. Mass housing – Defining housing project, public facilities and amenities in a housing estate.

6. Housing situations in India – problems of urban and rural housing with analysis of demand and supply and analytical. Study of existing and proposed Housing schemes in India, sluims and squatter settlements

7. Density computation, Economics of housing, and housing Finance.

8. Study of planning legislation and administration –

   a) National housing policy.
   b) Development control rules.
   c) Zoning, density, height, F.S.I., structure.

RURAL ARCHITECTURE

PAPER - 50 MARKS
SESSIONAL -50 MARKS

LECTURE- 03/ WEEK
TUTORIAL-01/WEEK

1. History of rural forms, forces, behind development [social, economic, political, religious]

2. Rural problems in India, development forces & architectural, regional, & local characteristic, comparison, limitation & advantage from conditions.

3. Demand and needs of rural population, housing pattern types and distribution, classification of houses and pattern, climatic and other considerations.

Materials, techniques of construction traditional and advanced, limitations, problems in the development need for rural facilities their growth pattern location and activity pattern for a solving solution. New materials-their implementations- services requirement's policies and frame- work for the development.

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04. PROJECTS AND CONSTRUCTION MANAGEMENT

PAPER- NIL
SESSIONS –50 MARKS

LECTURE-2/WEEK
TUTORIAL – 1/WEEK

2. Various scientific methods of Project Management. CPM, PERT, PLAN, BARCHART etc

3. Detailed study of 'CPM' and its application EFT,LET critical path EST,LST, Project duration, Floats etc

4. Economic order Quantity.

5. ABC analysis of Materials.

6. Optimum Project duration.

7. Maximization Techniques.

8. Managerial skills for project monitoring.

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05. QUANTITY SURVEYING AND ESTIMATION II

PAPER 100 MARKS
SEASONAL 50 MARKS

LECTURES 3/WEEK
TUTORIAL 1/ WEEK

Objective – to help students in taking off quantities of R.C Framed structure ste Structures & Services & Study composition of rate

COURSE OUTLINE

1. Taking off quantities of R.C. Framed structures, structural steel, buildin Drainage, plumbing & preparation above.
2. Rates for works as per P.W.D –DSR detailed estimates of quantities for tender, contingencies
3. Composition of rate percentage distribution for meters labor, tool an and profits of contractors.
4. Analysis of rates for principal item of works considering current rate market [For building material and labor wages.]
5. Preparation of indent of building materials with special reference to cemen and steel reinforcement.
6. Measurement of completed item for payment to contractor part, interim and final certificate of payment.

Sessional work based upon above topic 6.1,2,5, and 6.

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06.ARCHITECTURAL DESIGN –V

PAPER-18HRS.
SESSIONAL - 200 MARKS

MARKS-100
STUDIO- 09

OBJECTIVE- To acquaint students in assessing comprehensively needs and solutions of architectural problems in environmental context.

COURSE OUTLINE-

1. Lectures on Important and relevance of research and It's co-ordination in projecting comprehensive design Solution to large-scale project with components And activity involving extensively specified Profes al services.
2. The project to be selected for sessional work should embrace the aforesaid preview and the design program should be worked out and evolved with participation by students.
3. Project study vide sessional work is to include data collection, space planning analysis activity studies in detail and if possible a study of one building type as case study.
4. Total designing work on one project so selected for sessional work should cover planning, three-dimensional analysis and study, working out conceptually construction and structure. Conceptual organization of service

consist of site-development, civil sanitary and water-supply systems and detailing of selected portion to earn conceptual understanding of Ventilation, air-conditioning acoustical treatment and special design, aspects of a particular building type of complex nature such as- Cinema House, performing Art-Theatres, Large libraries, Departmental stores, Complexes for higher education, Housing schemes, Apartment Houses, Transport Terminals, Medical complexes for higher education. Housing schemes, Apartment Houses, Transport Terminals, Medical Complexes, Large Admn.Centres etc.

5. At least one 'Time Sketch' should be done in additional to the sessional work requisitioned on the main project. The weightage of this 'Time Sketch' should not be more than 20% of the total marks the sessional work of this subject.

Recommended Readings: -

1. People and the places they build wampler.
2. Equipotential space freedom in Architecture – Severino.
3. The failure of Modern Architecture -Brolinx.
4. In Praise of Architecture – GIO Panti.
5. Periodicals and Journals on Architecture.

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07.SUBJECT- BUILDING CONSTRUCTION-V

PAPER-100 MARKS TIME- 03 HOURS.
LECTURES-PERIODS2/WEEK STUDIO PERIODS 3 /WEEK

OBJECTIVE - To Study advanced construction application in structures and communication systems.

COURSES OULINE-

1. Conceptual study of Design and Construction of long span Structures like Sports Stadiums, Gymnasium, Auditorium etc. with special reference to design of seating, and various types of roofing systems. [Any one type of building shall be studied in detail]
2. Conceptual study of design and constructional detail of,
   - Shell Roofs.
   - Single curvature shells.
   - Short and Long span barrel vaults.
   - North light and cantilever Barrel vaults.
   - Double curvature shells.
   - Shell domes.
   - Double curved shells.
   - Folded slab roofs.

3. Grid structures.
   - Space frames.
   - Flat grids.
   - Folded grids.
   - Folded lattice plates.
   - Braced barrel vaults.
   - Braced domes.
4. Tension roof structures.
5. Construction Details of an Industrial Structure with details of Lighting, ventilation, rainwater disposal, gantry, and Introductory details of machine foundations and high strength flooring.
6. Study of materials and constructional details of Expansion joints.
7. Furniture Design – Room dividers, built in wardrobes, cabinets etc.

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08.INTERIOR DESIGN

PAPER-NIL STUDIO –3 /WEEK
SESSIONAL - 100 MARKS

The control of the environment through the design of the plan and the outer shell of the building cannot be complete since extremes of heat, cold, and light and sounds penetrate into the interior where they can be further modified by the planning of internal spaces. The scope of this subject is therefore to enable the students to handle the interior spaces imaginatively.

1. Historical background of design of furniture, study of Furniture Styles, tapestry, Carpet.
2. Difference between interior Design and interior decoration, Fashion and Style.
3. Ergonometric study and design of furniture.
4. Principles of interior design.
   a. Three perceptions of interior design. The Ancient/Medieval Concept.
   b. The Renaissance concept.
   c. The Modern Concept.

09.COMPUTER APPLICATIONS

PAPER- NIL SESSIONAL - 50 MARKS
STUDIO-03/WEEK

This subject aims at making the students familiar with the computer application in Architecture.

1. Introduction to computers current trends.
2. Use of computers in architecture and architectural profession, various packages in general and there application.
3. Use of computer as a tool for imagination and design. Using Paintbrush, Coral draw 3-D Home etc.
4. Introduction to computer aided drawing, various software used such as Auto CAD, Auto Architect, Intergraph, Formz, Graphisoft, 3-D Studio etc.
5. Basic of 2-D drafting, Drawing Simple objects, projections and plans etc.

TUTORIALS-

a. Exercises on 2-D composition and computer graphics etc.
b. Exercises on 3-D composition in the form of plan and elevation.
c. Drafting plans of simple small buildings like My School, My Home.

FOURTH YEAR B.ARCH SYLLABUS
TERM - II

01.APPROPRIATE TECHNOLOGY

PAPER-100 MARKS
SESSIONAL 50 MARKS

LECTURE-03/WEEK
TUTORIAL 1/WEEK

The objective of this subject is to acquaint the student of architecture with the present status of historically emerged and socially determined rural housing technology on one hand and on the other, to introduce new/improved/disseminate technologies which can improve living conditions and be sustained over time.

It is expected that the content of the course swill enrich the understanding of the problem of rural/urban habitat of our country, and enable the student to generate affordable, socially appropriate, architectural designs/innovative solution that address the need of poor.

SECTION – A

1. Discussion on the typical space requirement of rural household, living style and household activities, storage requirement for grains, fodder, fuel agricultural equipment's etc. village artisan and their work sheds. Introduction to existing state of art of housing building materials and construction technology.
2. Determination of suitability of soil for mud walls. Soil compositions test, plasticity test, test for optimum water content etc. Soil stabilization.
3. Wattle and daub walls, rammed earth walls, adobe walls, soil cementblock, compressed mud blocks walls etc. Water proofing of mud walls. water retardant treatment of hatch roof. Nubian arch roof, burnt clay of gumaille, roofs.
4. Saving of cement by use of fly ash cement, fly ash concrete, mixer, lime pozzolana, rice husk ash cement, fly ash concrete, mixer, lime pozzolana mortars, pozzolanic materials and small scale production of lime pozzolana.

SECTION -B

8. Prefabricated roofing and walls components precast R.C.C.joints, precast bri panels, doubly curved tiles, R.C.C.planks, precast concrete skeleton system, precast stone blocks masonry etc.

6. Importance of biogas as plants for ruaral areas. Type designs of biogas plant, considerations in designing biogas plants and construction methods.
7. Utilization of solar energy for rural applications, photovoltaic cells and systems, solar water heaters, types of solar collecters.
8. Aspects of rural sanitation, water disposal, drinking water low cost compost latrines, use of bamboo in construction, temporary sheds /structure, frame less doors / windows.

SESSIONAL WORK: -

Notes, home assignments and tests on above topics, report on site visits.

02. PROFESSIONAL PRACTICE – I

PAPER – 100 MARKS LECTURES- 3/WEEK
SESSIONAL WORK –50 MARKS TUTORIAL –1/WEEK

OBJECTIVES – To acquaint students with avenues of professional services as well as with the relevant scope ,mode and conduct of practice .

COURSE OUTLINE: -

1.a) Architect's office set-up, filling and recording of Correspondence drawings, letters and reports writing.

b) Partnership, Registration and Accounts system.

1.a) Detailed study of scope and responsibility of architect's duties as framed under Architect's act 1972.

b) Code of conduct, scale of professional fees, membership of professi organizations.

c) Architectural competition- participation types and procedures.

2. Outline of valuation of properties standard rent, legal constraints regarding building repairs, dilapilations and easement rights.

RECOMMONDED READINGS: -

1) Private architectural practice – Tayler.
2) Professional practice – R H Namavati.
3) Architect act 1972.
4) Council of architecture and I.I.A. publication on above topics.

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03.CONTRACT DOCUMENT AND BUILDING BYELAWS.

PAPER – 50 MARKS – 2 HOURS. SESSIONAL - 50MARKS
TUTORIAL – 1/ WEEK LECTURES -2/WEEK

OBJECTIVES- To acquaint student with documentation and procedures of making contract for the execution of projects and managerial aspects of the same.

COURSE OUTLINE: -

1) Types of contract documents and selection of the contractor for the work /project, letter of intent to the contractor.

2) Articles of agreement and condition of contract (study of conditions stipulated by I.I.A./C.O.A).

3) Planning legislation – Introduction MRTP act 1966 with specific reference to the section 42, 44,45,50. Urban land ceiling act 1976 with specific reference to the section to 20,21,22. Introduction to national building code and unified development control rules.

1) Urban pattern
2) Study of town planning in India
3) Regional planning reports of the cities of Bombay, Pune.
4) Development plan reports of Pune, Bombay.

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04.BUILDING ECONOMICS

PAPER- 50 MARKS - 2 HOURS
SESSIONAL- 50 MARKS

LECTURES 2/WEEK
TUTORIALS- 1/WEEK

OBJECTIVES- Orientation in economics for application in the architectural practice of building and construction industry.

COURSE OUTLINE: -

1. General introduction to economics.
2. Basic concept such as wants, ends, means, technical problems, consumption production exchange, distribution, factors of production, and their rewards, value, price, cost, of economic cost, accounting cost, laws of returns, production possibility curve, concept of optimisation equillibrium of the firm, planning democratic and diatatorial.
3. Land- its uses and general relevance in building economics location cost rent.
1. Problem of housing in the present context of development & Welfareeconomics.
5. Labour and business organisation including construction Industry equillibrium of the firm operating in the competitive and monolistic markets.
6. Finance – various source of building finance and the nature of their operations.
7. Property investment returns, valuation, morgages – general Theory.
   The main items of the building inputs and materials –there markets and prices.

RECOMMONDED READINGS: -

1.Economics – Samuelson.
2. Textbook of economics theory- Stonier and Inaghe
3.Introduction to economics – R.C.Dwett.
4.Building economics.

05. ELECTIVE – II

PAPER- NIL
SESSIONAL- 50 MARKS.

LECTURES-2/WEEK
TUTORIALS- 1/WEEK

OBJECTIVES- To inculate in students an ability to study and conduct research work independently on the subject related to architecture including its presentation in written form and visual presentation.

A batch of maximum 20 students shall select one of the topics from the list of the subjects.

1. Industrial structures
2. Long span structures.
3. Maintainance of structures.
4. Hospital architecture.
5. Product design.
6. Psycological spaces in architecture.
7. Energy conscious architecture.
8. Current journels and periodicals.

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06. ARCHITECTURAL DESIGN-VI

PAPER-100 MARKS-18 HOURS SESSIONAL MARKS- 200
LECTURES - NIL STUDIO – 16/WEEK.

OBJECTIVE – To acquaint students in assessing comprehensively the needs and solutions of architectural problems in environmental context.

COURSE OUTLINE :-

1. Lectures on importance of relevance of research and its co-ordination in projecting comprehensive design solutions to large scale projects with many components and activities involving extensively specialized professional services.
2. The project to be selected for sessional work should embrace the aforesaid preview and the design program should be worked out and evolved with participation by students.
6. Project study vide sessional work is to include data collection , space planning analysis, activity studies in detail and if possible a study of one building type as case study.
7. Total designing work on one project so selected for sessional work should cover planning, three dimensional analysis and study working out conceptually construction and structures. Conceptual organization of service consisting of site development, civil sanitary and water-supply systems and detailing of selected portion to earn conceptual under-standing of ventilation, air-conditioning acoustical treatment and special design, aspects of a particular building type of complex nature such as Cinema- House, Performing Art Theatres, Large Libraries,

Departmental stores, complexes for Higher- Education, Housing schemes, Apartment -Houses, Transport Terminals, Medical complexes, Large Admn; Centres etc

5. least one 'Time Sketch' should be done in addition to the sessional work requisitioned on the main project. The Weightage of this 'Time Sketch' should not be more than 20% of the total marks the sessional work of this subject.

Recommended Readings.

1. People and the places they build- wampler.
2. Equipotential spaces-Freedom in Architecture- Severino.
3. The failure of Modern Architecture- Brolinx.
4. In praise of Architecture – GIO Ponti.
5. Periodicals and Journals on Architecture.

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07.BUILDING CONSTRUCTION –VI

PAPER- 3 HOURS SESSIONAL WORK – 150 MARKS
LECTURES- 2/WEEK STUDIO- 6/WEEK

OBJECTIVE – Study of details of applied construction in regard to building repairs and semi permanent structures.

COURSE OUTLINE: -

1. Construction details of semi permanent structure such as exhibition pavilions, temporary viewing gallories, etc.
1. Constructional details of sound and heat insulation and their application in such areas such as conference halls, concert halls, recording studios, cold stoarage rooms,roof insulation etc.
2. Constructional details of multi basement (maximum double basement) with waterproofing treatment, lighting, ventilation, rainwater disposal and diaphragm walls below ground level.
3. Conceptual study of design and construction of curtain walls and structural glazing including external facings and cladding details.
4. Conceptual study of shoring and underpinning.
5. Interesting architectural and interior details based on architecture design project.(min. two details each)
6. Earthquake resistant building construction.

a) Quality control in construction, sequence of construction, good supervision practices critical checkpoints and certification at certain stages, reporting, maintainance of records, testing etc.
b) Seismic vulnerability evaluation of existing buildings, aging, wheathering, developments of cracks etc.
c) Concepts in repairs, restoration and seismic strengthening materials, and equipments for restoration of masonry, and concrete structures.
d) Methodologies for seismic retrofitting.

1. Study of the following material shall be done.
a) Sound and heat insulating material.
b) Plastic and rubbers.
c) Adhesives.
d) Mastic and Sealents.
e) Bituminous material used in road construction.
f) Any other material incorporated in above –mentioned construction but no covered above.

REDERENCE MATERIAL: -

1. Elements of structures by Morgan
2. Structures in architecture by Salvadori.
3. Building construction by Mackay W B vol 1to 4.
4. Construction of building by Barry vol. 1 to 5
1. Construction technology by Chudley vol. 1 to 6
2. Building construction by Ching francis D K
3. Elementary Building Construction by Mitchell.
4. Structure and fabric by Everet.

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08. ARCHITECTURAL CONSERVATION PROJECT

PAPER – NIL LECTURES – NIL
SESSIONS – 150 MARKS STUDIO- 5/WEEK

1. Definitions and understanding conservation, preservation, Restoration Rehabilitation, adaptation, Rebuilding and a like terms.
2. Development of the concept of conservation and preservation in the west after Second World War.
3. Development of the system into Archaeological survey of India [ASI] by mid 1950, after the end of Second World War.
   National and International agencies involved in education, training and implementation in the field of conservation.
4. Method of listi9ng of monuments as per INTACH rules. Pioneer projects or urban conservation at Chanderi, Ujjain, Jaisalmer, Hampi, Indore, Junagarh etc.
5. Awareness factors about the subject reason at lack of awareness an of process to improve it.
6. Difference between monumental conservation of India as showpieces for tourism and urban conservation in the west to preserve the heritage.
7. Chemical treatment and structural treatment for the conservation integrated.

Tutorials/ Studio work

Assignments are formulated to cover the above theory

Readings

1. Roy Worskett, "The Character of Towns. an Approach to conservation. The Architectural press, London [1969] Wolfred Burns," N
2. Recommended EW Towns for old. The techniques of urban Renewal". Lconar'd Hill Ltd. London [1963]
3. Wilson James G."Urban Renewal The Record and the Controversy" M.I.T. press, Boston (1966)
4. Proceedings of a conference organised by the institution of civil engineers London, " repairs and renewal of Building" Thomas Telford ltd London (1983).

09. COMPUTER APPLICATION

PAPER- NIL
SESSIONAL-50 MARKS

LECTURES- NIL
STUDIO- 3/WEEK

The process of architectural design involves regorous analytical and synthesizing activity, which can be aided by computer. This course of study shall train the student to use a Computer along with a Plotter.

LECTURES –

Computer systems and languages, Computer-Organization.
Computer periferrals, software /hardware concept. Utility programme packages of various types for purposes like accouting statistical analysis, graphics etc. Use of designing productivity of Computer –study of procedures for use of Auto Cad and similar packages available.

EXERCISE: -
Handling the software package on the computer like AutoCad, Autolisp etc. olving the following exercises.

1.recording the programme.
2.data entry
3.running the programme.
4.saving the results or plotting on plotter/printers.