UNIVERSITY OF PUNE

DETAIL SYLLABUS

FOR

FOURTH YEAR BACHELOR OF ARCHITECTURE
(CONSTRUCTION MANAGEMENT)

(To be implemented from 2014-15)

FACULTY OF ENGINEERING

BOARD OF STUDIES IN ARCHITECTURE.

FOURTH YEAR B.ARCH (CM).

Sr. No.	Subject Code	Name of the Subject	Head	Teaching Scheme			Examination Scheme		
				Load/ Week		Total	Term I	Term II	Total
				L	S/P	Load	Marks	Marks	Marks
1	413451	Architectural Design-IV	SV	2	8	10	300	300	600
2	413452	Advanced Const. Materials & Equip. Mgmt.	SV	2	5	7	150	150	300
3	413423	Design, & Tech. Elective.	SS	1	1	2	50	50	100
4	413424	Quantity Surveying & Estimation.	SS	1	3	4	50	50	100
5	413425	Quantity Surveying & Estimation.	TH				0	100	100
6	413453	Specification Writing	TH	2	0	2	0	100	100
7	413428	Town Planning	SS	1	3	4	50	50	100
8	413429	Town Planning	TH				0	100	100
9	413430	Professional Practice	SS	2	0	2	50	50	100
10	413431	Professional Practice	TH				0	100	100
11	413432	Dissertation & Architectural Project Part I	SS	1	2	3	100	100	200
12	413454	Const. Mgmt. Theory& Practices	SS	1	1	2	50	50	100
		TOTAL		13	23	36	**800**	**1200**	**2000**
STAGE –II - LEGEND - SS- SESSIONAL, V-VIVA VOCE , TH-THEORY PAPER									

DETAIL SYLLABUS

FOURTH YEAR B.ARCH.

Subject Code : **413451 ARCHITECTURAL DESIGN IV (Sessional and Viva)**			
TEACHING SCHEME		**EXAMINATION SCHEME**	
Lecture Periods (per week)	02	Term I and Term II Sessional (Internal) Sessional (External) Viva	 125 marks (for each term) 125 marks (for each term) 50 marks (for each term)
Studio Periods (per week)	08	Total sessional marks for both terms	600 marks
Total Contact Periods per week	10	Paper	nil
		Total Marks	600 marks

OBJECTIVE

Introduce students progressively to designing for larger environmental contexts (preferably Indian) and for more complex multifunctional complex of buildings / situations like mass scale residential, institutional, commercial , transportation, health-care facilities.

COURSE OUTLINE

A. Design of Urban Large Scale / density based housing with approximately minimum 200 tenements of density 120 tenements / hectare. Socio-economic determinates, legislative, economic constraints and technological alternatives shall be studied in detail. Exercises in simulation and conceptual modeling shall be conducted. Application of concepts of community participation, financing and construction planning, computer aided project documentation including working drawings, preliminary estimates, outline specifications and scheduling aimed at comprehensive understanding of the implementation process.

B Design of multifunctional complex of buildings in the urban context. Issues related to the growing problems of urban areas in third world countries and their future developments shall be explored. Emphasis on the design with relation to the contextual environment, traffic and planning controls and impact analysis. An understanding of the architectural implications of such developmental scheme should lead to insight in the formulation of political and administrative policies for the development of the physical environment.

The Design Studio would comprise of preparation of project planning and appraisal scheme for the project to be designed. Procurement / preparation of working drawings for the building typology. Working out the detailed specification and estimate. Preparation of the work break down schedule and scheduling with help of bar charts (material, equipment and labour)

SESSIONAL WORK

- Two assignments for a period of 18 weeks each
- Complete Self-explanatory projects, graphically presented in the form of hard copies / printouts showing comprehensive understanding of the design and implementation process as mentioned in the course outline.
- Second Design project can be given in group of not more than 3 students provided the project is complex enough.
- Case studies, which will supplement / support the Architectural Design project can be done in groups.

All Architectural Design Assignments and submissions shall lay emphasis on designing Earthquake Resistant Structures, which will be worked out in consultation with the Teacher of Structures and the submission work will reflect various technologies adopted.

REFERENCE BOOKS:

- All available books on Architectural Design.
- Construction Project Management - K.K. Chitkara.
- Construction Management - P.K Joy.

Subject Code : **413452 ADVANCED CONSTRUCTION MATERIALS & EQUIPMENT MANAGEMENT**.(Sessional and viva)			
TEACHING SCHEME		**EXAMINATION SCHEME**	
Lecture Periods (per week)	02	Term I and Term II Sessional (Internal) Sessional (External) Viva	 50 marks (for each term) 50 marks (for each term) 50 marks (for each term)
Studio Periods (per week)	05	Total sessional for both terms	300 marks
Total Contact Periods per week	07	Paper	nil
		Total Marks	300 marks

COURSE OBJECTIVE :

To acquaint students with more complex structural systems, constructional details and building types with emphasis on applied constructional details from Architectural Design Project with developing the skills in Architectural Detailing.

COURSE DETAILS: For Advanced Construction Materials:

Note: As far as possible and practicable various topics mentioned below shall be combined and studied as extension of Architectural Design Programme in Sem VII and VIII in the form of Applied Constructional Details.

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 details 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.

3. Folded slab roofs

4. Grid structures
   - Space frames
   - Flat grids.
   - Folded grids
   - Folded lattice plates
   - Braced barrel vaults
   - Braced domes

5. Tension roof structures

6. High Rise Structures

7. Construction Details of an Industrial Structure with details of lighting, ventilation, rainwater disposal, gantry and introductory details of machine foundations and high strength flooring.
8. Construction Details of semi permanent structures such as exhibition pavilions,temporary viewing galleries etc.
9. Constructional details of sound and heat insulation and their application in areas such as conference halls, concert halls, recording studios, cold storage rooms, roof insulation etc.
10. Constructional details of swimming pools and all the appurtenant services.
11. Constructional details of multi basement (maximum double basement) with waterproofing treatment, lighting, ventilation, rainwater disposal and diaphragm walls below ground level.
12. Housing colony road constructional details including basic terminology, surface water drainage etc.
13. Conceptual study of Design and Constructional of Curtain Walls and Structural Glazing including eternal facings and cladding details.
14. Conceptual study of shoring and underpinning
15. Study of materials and constructional details of Expansion joints.
16. Interesting Architectural and Interior details based on Architecture Design Project. (Min two details each)
17. Earthquake Resistant Building Construction.
    - Quality control in construction, sequence of construction, good supervision practices, critical check points and certification at certain stages, reporting, maintenance of records, testing etc.
    - Seismic vulnerability evaluation of existing buildings/
    - Weakness in existing buildings, aging, weathering, developments of cracks etc.
    - Concepts in repair, restoration, and seismic strengthening materials, and equipments for restoration of masonry, and concrete structures.
    - Methodologies for seismic retrofitting.
18. Fire resisting constructional details
19. Study of following Material shall be done

- Bituminous Materials used in road construction.
- Any other material incorporated in above mentioned construction but not covered above.

COURSE DETAILS: For Equipment Management:

OBJECTIVE: Construction is the ultimate objective of a design and machine makes the accomplishment of that objective possible. The subject introduces the fundamentals for planning, selection and utilization of construction equipment, analyze the operational problem and arrive at a practical solution for completing the task.

- Introduction to equipments intensive operation and risk, their importance in construction.

- Factors affecting the selection of tools and equipment, planning scheduling for use; Equipment costs, owning and operating, owning, renting and leasing, requirement of power for the equipments.

- The various types of equipments – Earth compaction and stabilization equipment, Dozers, Loaders, Exactors, Trucks, Graders, Comparators, Concrete Construction Equipments – Mixers, Scrappers, Truck and Hauling Equipments.

- Excavators, Cranes, Draglines & Clamshells, Batching Plants, concrete Pumps, Transits Mixers, Vibrators, Finishing Equipments, Lifting and Hoisting Equipments – Pullers,

Builder's Hoist; Road construction Equipments, Pumps, Compressors, Pulling Equipments, etc.

Sessional work: Sketches, Tests & Assignments

REFERENCE BOOKS:

1. Elements of Structures by MORGAN
2. Structures in Architecture by SALVADORI

To Study standard building construction:

- Building Construction by MACKAY WB. Vol. 1 to 4
- Construction of Building by BARRY Vol. 1 to 5
- Construction Technology by CHUDLEY R. Vol. 1 to 6
- Building Construction illustrated by CHING FRANCIS D. K.
- Elementary Building Construction by MITCHELL
- Structure and Fabric by EVERET
- To study building materials
- National Building Code and I.S.I. Specifications
- Materials and Finishes by EVERET
- A to Z Building Materials in Architecture by HORNBOSTLE.

To Study Equipment Management:

Subject Code : **413423 DESIGN &TECHNOLOGY ELECTIVE** (Sessional)			
TEACHING SCHEME		**EXAMINATION SCHEME**	
Lecture Periods (per week)	01	Term I and Term II Sessional (Internal) Sessional (External) Viva	 25 marks (for each term) 25 marks (for each term) nil
Studio Periods (per week)	01	Total sessional marks for both terms	100 marks
Total Contact Periods per week	02	Paper	nil
		Total Marks	100 marks

AIMS AND OBJECTIVE

- The subject of Electives has been introduced in the syllabus with the specific intention of in depth study of a particular subject of a student's liking in greater detail but in the larger context of overall scope of Architecture syllabus at undergraduate level. This will give students an opportunity to develop their skills in a subject they may opt, to make their career in future. Architectural practice is a team effort in which persons of different skills in varied fields are required such as concept developers, technical / working drawing experts, specification writers, quantity surveyors, project managers, contract managers, interior designers, architectural photographers, architectural Journalists, signage and graphic designers, energy consultants, building services consultants, marketing managers etc. In depth study in Electives will prepare the technical base of the students. Since the Architectural Projects in future are going to be very complex, the need of support staff in Architectural Practice will be fulfilled and the student's skills and talent will be effectively used.

- The Colleges will have the opportunity to focus upon a particular group of Design and Technology electives depending upon the overall philosophy and mission statement of the College. Individual colleges may offer topics depending upon the availability of experts and resource material.

COURSE OUTLINE TERM I: The probable Design Elective topics are as follows :

1. Interior Design.
2. Industrial and Product Design.
3. Urban Design
4. Advanced Landscape Design
5. Housing.
6. Set Design.
7. Special Facilities Planning
8. Sustainable Development and Architecture
9. Barrier free Environment and Design.
10. Urban and Rural Planning
11. Infrastructure Planning
12. Advanced Computing in Architecture
13. Climate responsive Architecture.
14. Mathematics and Science in Design.
12. Theory of Architecture.

DETAILED SYLLABUS:

Sustainable Development and Architecture:

- Philosophy of Sustainability, management and design aspects
- Management in terms of resource and conservation management, anti□pollution measures, Water / waste management etc.
- Design aspect in terms of designing the structures, such as solar passive, passive, energy efficient, cost□effective, eco friendly designing
- Studying other forms of energy and their applications like Tidal / hydal / wind / biotic.
- Studying environmentally sustainable technologies, construction techniques, and use of materials.
- Studying environment related broader topics and issues like river□beds, environmental pollution etc.

Barrier free environment and design:

- Types of disabilities and its implications in Architecture, barrier free environment, access provisions to facilities and amenities.
- Special design considerations in residential buildings, congregational buildings like auditoriums, theatres, stadias, transport terminals etc, Institutional buildings, outdoor appurtenances, garden, parks etc.
- Study of norms set by Central Government.

Urban and Rural Planning:

- Introduction to hierarchy of planning – levels and their impact on architecture and architectural profession, understanding the interrelation between urban planning and architecture in terms of FSI, Ground Cover page, density and urban form.
- Comprehensive plan of action for reducing inter-regional and intra-regional disparities. Introduction to Regional plans, Master plans, Zonal plans, town planning schemes and Urban design schemes. Special requirements for rural planning.

Infrastructure Planning

- Need for infrastructure planning. Introduction to types and design of infrastructure requirements for large scale architectural projects like drainage, water supply, storm transport facilities, provision of amenities, security systems, remote control systems, telecommunication system etc.

Advanced Computing in Architecture

- Software customization – developing expert system for parametric design using languages such as Visual Basic, Auto Lisp etc. Developing plug□ins for programs like 3D, Studio Max etc.

- Expert software which can either be a part of the main software or a third party software for tasks like working of quantities making atomization for typical drawings such as municipal / centerline plans etc.
- Advanced 3D modeling with the use of animated maps, Special effects plug-ins, advanced lighting, animations etc.
- Exploring the sue of Internet for architectural data exchange and development of web based solutions for the same (eg. Web page designing).
- Virtual Reality

Special Facilities Planning in Hotels and Hospitals

- Fumigation
- A/c for rooms, lobbies, lounges, OT
- Central gas / suction supply
- Electrification for various spaces and gadgets like defibrillator, CT scan, radiology, MRI etc.
- Water management with incinerator etc.
- Laundry
- Hot water, Boiler, Solar
- Emergency lighting
- Food management / movement / kitchen layouts / sotres / eating places.
- Service floor
- Channeled music

Large span structures like Multiplex, Auditorium, Railway stations, covered studio, airport terminal, hangers etc.

- Structural systems
- Light and ventilation
- Seating
- Crisis planning routes during emergency
- Surface finishes
- Rain water disposal
- Luggage movement
- Parking
- Telecommunication and security systems.

COURSE OUTLINE TERM II The probable Technology Elective topics are as follows:

1. Modular Planning and System Building Construction
2. Non-Conventional Technologies
3. Rural (Vernacular) Architecture.
4. Energy Efficient and Eco Friendly Construction.
5. Earthquake Resistant Construction.
6. Smart and Intelligent Buildings
7. Building Performance Analysis and Appraisal
8. Structure and Form in Architecture.

DETAILED SYLLABUS:

Planning, Motoring & Scheduling software: Understanding the applications of computer software for rescheduling of the project, with read sheets and Database software.

Application packages for estimating, project planning and control, Accounting and Cost Engineering.

The design studio would comprise of preparation of at least one planning scheme for construction of small residential / commercial / industrial building with the help of software- Microsoft Project.

Detailed syllabus given above is indicative only. Detail syllabus for all Elective Topics can be finalized, considering the time and marks allotted to the subject, by individual College in consultation with expert faculty and can be implemented after approval by the board of studies.

SUBMISSION DETAILS:

The students are expected to study the selected topic in depth, including the basic principles, and their application in built projects by undertaking case studies, necessary site visits, and collecting all the relevant information to make it an exhaustive study and present it in a well documented format having A3 / A4 size papers properly filed in a file with a signed certificate from concerned Teacher / Expert stating that the study was carried out under his guidance and countersigned by the Principal / Academic Co-ordinator.

Subject Code : **413424 QUANTITY SURVEYING & ESTIMATING (**Sessional) Subject Code : **413425 QUANTITY SURVEYING & ESTIMATING** (Paper)			
TEACHING SCHEME		**EXAMINATION SCHEME**	
Lecture Periods (per week)	01	Term I and Term II Sessional (Internal) Sessional (External) Viva	 25 marks (for each term) 25 marks (for each term) nil
Studio Periods (per week)	03	Total sessional marks for both terms	100 marks
Total Contact Periods per week	04	Paper	100 marks
		Total Marks	200 marks

OBJECTIVES:

1. To train students in computing quantities of various building items for simple load bearing structures and acquaint them with various types of estimates including mode of measurements as adopted by I. S. 1200.
2. To train students in computing quantities of various building items of R.C.C. framed structure, steel structure, building services such as water supply, sanitation and drainage, electrical installations and acquainting them with rates of various building items.

COURSE OUTLINE:

1. Introduction to the definition, aim and scope of “Quantity Computation”
2. Study of different types of estimates
3. Study of mode of measurements as stipulated in I. S. 1200
4. Methods of computing quantities for load bearing types of structure and preparing abstract and bills of quantities including units of measurements.
5. Computing quantities of various building items for r.c.c. framed structure, steel structure and building services such as plumbing and water supply. Preparing of quantities for estimation and tendering purposes.
6. Study of composition of rates of various building items, percentage distribution in the rates of materials, labour, tools and plant, contractor’s profits and overheads etc.
7. Analysis of rates of main items of building work with reference to prevalent market rates of materials and labour wages.
8. Preparation of indent of various building materials for r.c.c. framed structure.
9. Measurements of completed items for payment to contractor’s interim and final certificate.
10. Introduction to use of computer for computation of quantities of various building items.

SESSIONAL ASSIGNMENTS:

Hand written Computation and Bills of Quantities shall be prepared of following :

1. Load bearing structure of total plinth area between 15 to 25 sq. mts.
2. R.C.C. framed structure comprising of Ground and First Floor having total built-up area between 100 to 150 sq. mts. Including staircase and toilet block
3. Computing quantities of single storied steel framed factory building or workshop having total built-up area between 100 to 150 sq. mts. Including m. s. trusses, purlins and sheet roofing.
4. Working out rate analysis of routine civil items.

RECOMMENDED READING :

1. Professional Practice by R. H. Namavati
2. Estimating and Costing by Rangawala and B. N. Dutta
3. Civil Engineering Contracts and Estimates by B. S. Patil
4. I.S.I. Handbook of measurements of building works.

Subject Code : **413453 SPECIFICATION WRITING** (Paper)

TEACHING SCHEME		**EXAMINATION SCHEME**	
Lecture Periods (per week)	02	Term I and Term II Sessional (Internal) Sessional (External) Viva	 Nil Nil Nil
Studio Periods (per week)	--	Total sessional marks for both terms	Nil
Total Contact Periods per week	02	Paper	100 marks
		Total Marks	100 marks

OBJECTIVES:

To acquaint students with methodology of writing specifications with reference to building trades, materials, workmanship and performance of different items of work and introducing the students to specifications as an integral part of contract document for building projects.

COURSE OUTLINE

1. Specification as part of contract document, definition, need and importance, its relationship with working drawings, bill of quantities and schedule of rats.
2. Types of specifications, open, closed, restricted, prescriptive, performance based, or combination of above types. Use of manufactures guide etc.
3. Specification writing method to include master list, sectional formats, page formats, general material items, tests, performance, mode of measurements etc.
4. Methodology of writing item wise detailed specifications including methods and forms of writing descriptive notes on materials and workmanship based on working drawings.
5. Collection of catalogues and technical information on various materials, products and specialized items.
6. Preparation of checklist for writing detailed specifications.
7. Study of different building trades, their scope and contents
8. Introduction to writing specifications for building services and checklist for services such as Water Supply, Drainage, Acoustics, Electrical and HVAC installations.
9. Broad outline of specification for other service installations in building such as

- Communication systems – elevators, escalators, telecommunication
- Accessibility – arrangements for disabled person.
- Water-proofing. (Cement, bitumen, polymer based).
- External development like roads (flexible and rigid construction) pavements, kerbs,

lighting, security – systems, fencing.

- Environment Responsive Systems, Renewable energy applications, efficient fuel systems.

SESSIONAL ASSIGNMENTS:

1. A journal shall be prepared which will cover notes on the portion mentioned above.
2. Specification writing shall be studied in conjunction with working drawings and the first assignment of Load bearing structure of 15 to 25 sq. mt. Plinth area will be covered by preparing specification for common building materials and trades.
3. Technical literature on various specialized items and manufacture's catalogues shall be collected.

RECOMMENDED READING:

1. Indian Standard Specifications
2. C.P.W.D. Specifications and schedule of rate analysis
3. Specification Writing for Architects and Engineers. By Donald A. Watson.
4. Specification Writing for Architects and Surveyors by Arthur J. Wills

Subject Code : **413428 TOWN PLANNING** (Sessional) **413429 TOWN PLANNING** (Paper)			
Teaching Scheme		**Examination Scheme**	
Lecture Periods per week	1	Term I and Term II Sessional (Internal) Sessional (External) Viva	 25 marks (for each term) 25 marks (for each term) nil
Studio Periods per week	3	Total sessional marks for both terms	100 marks
Total Contact Periods per week	4	Paper	100 marks
		Total Marks	200 marks

OBJECTIVE

To provide Town Planning inputs to architectural design. It is intended that Town Planning exercise should run parallel to the topics being taken up in architectural design studio. The focus will be on application of Town Planning theories in Town Planning studio.

COURSE OUTLINE

- Introduction to the subject of Town Planning, need of study of Town Planning for an architect.
- Planning Theories – Theories by Le Corbusier, Sir Pattrick Geddes, Sir Ebenezer Howard, C. A.Doxiadis, Clarence Perry and Lewis Mumford.
- Study existing settlement with respect to current theories in planning.
- New towns and cities in India. (Administrative, Tourism Potential Areas, Industrial, Railway Town, Religious Activities, Project Based Areas etc.)
- Introduction to Town Planning Schemes, Development Plan and Regional Plan. Types of surveys (Physical, social and Economical, Aesthetic Surveys) and method of their analysis, policy making and implementation, including finance funding and phasing.
- Housing – National housing policy, social aspects of housing, economics of housing, types of housing based on various aspects and land economics.
- Introduction to Planning Legislation : Introduction to M.R.T.P. Act of 1966, Land Acquisition Act of 1894, Maharashtra Slum Redevelopment Act, Urban Arts Commission Act, Maharashtra Tree Act, Municipal Act, Urban Ceiling Act.

- M.I.D.C. Act, Mhada Act. Development Control Rules for A, B, C Class Towns, and Municipal Corporations. Development Control Rules of Local Municipal Corporations.
- Introduction about Professional Bodies in planning profession such as T.C.P.O. and I.T.P.I. etc. Various Planning authorities like D.D.A., CIDCO, MMRDA, and PCNTDA etc. Introduction to Local and Self Government in urban as well as rural areas, introduction to 73^{rd} and 74^{th} amendment to the constitution.
- Urban redevelopment and renewal including necessary surveys, Urban traffic and Transportation.
- Brief study about role of Urban Design, Landscape Design and Streetscape Design in Town Planning.

SESSIONAL WORK

- Subdivision of plots (including conversion of land to Non Agriculture use)
- Study report on Town Planners and towns designed by them.
- Neighborhood layout.
- Redevelopment of existing slum area of the city
- Project based on Urban Design and Landscape Design aspect in planning.
- Case studies of various types of housing
- Visit to any of the planning organizations, builders and promoters
- Study of existing Town and Town Planning proposals
- Urban renewal scheme
- Social and environmental problems of sporadic and unplanned growth of urban and rural areas.

REFERENCE BOOKS :

1. Urban Pattern – Arthur B. Gallion
2. Design of Cities – Edmund Bacon
3. Site Planning – Kevin Lynch
4. Image of City – Kevin Lynch
5. Town and Country Planning in India – N. K. Gandhi
6. Town Planning – Law, Administration and Professional Practice – G. R. Diwan
7. P.W.D. Handbook of Town Planning
8. Development Plan and Regional Plan Reports
9. Tomorrow – Peaceful Path To Social Reforms – Sir Ebenezer Howard.
10. Basics of Town Planning – J. G. Keskar
11. Townscape – Gorden Cullen
12. Architecture of Town and Cities – Paul D. Spreiregen
13. The New Landscape – Charles Correa
14. Land Acquisition Act of 1894
15. Maharashtra Slum Redevelopment Act
16. Urban Arts Commission Act
17. M.R.T.P. Act of 1966.

TEACHING PLAN :

1. Out of all the exercise mentioned in sessional work, minimum six exercises are to be completed including following three compulsory exercises
   i. Case studies of various types of housing
   ii. Study of existing Town and Town Planning proposals.
   iii. Project based on Landscape Design, Urban Design aspects in Town Planning.
2. Out of the rest excluding above three exercises any three could be taken up in rotation.
3. The exercises can be group work.

Subject Code : **413430 PROFESSIONAL PRACTICE** (Sessional) **413431 PROFESSIONAL PRACTICE** (Paper)			
TEACHING SCHEME		**EXAMINATION SCHEME**	
Lecture Periods (per week)	02	Term I and Term II Sessional (Internal) Sessional (External) Viva	 25 marks (for each term) 25 marks (for each term) nil
Studio Periods (per week)	--	Total sessional marks for both terms	100 marks
Total Contact Periods per week	02	Paper	100 marks
		Total Marks	200 marks

OBJECTIVES:

- To acquaint the student with the various responsibilities of an architect and understand the technicality of the profession.
- To acquaint students with avenues of professional services as well as with relevant scope, mode and conduct of architectural practice.
- To acquaint students with documentation and procedures for execution of building works/projects as well as with managerial aspects of the same.

COURSE OUTLINE: TERM I

- Nature of profession, difference between trade, business and profession,
- Introduction to the importance of professional organizations like I.I.A., COA & their membership.
- Architects office set up and administration, correspondence, letters, reports, taking instruction from the client, its interpretation, design process and its stages, preparation of drawing, filing, standardization and documentation.
- Office Organization, Proprietorship, Partnership, Company etc; Registration as Firm / Company etc.
- Accounts systems and Taxation.
- Detailed study of scope of comprehensive architectural services as framed under Architect's Act 1972.
- Code of Conduct, scale of professional fees as per rules and regulations framed by the Council of Architecture.
- Architectural Competition – Types, procedures, as per guidelines of the Council of Architecture.
- Introduction to valuation of properties, its purpose and different methods of valuation as adopted by different organizations / bodies. Dilapidations and Easements.

COURSE OUTLINE: TERM II

- Tenders – Types and procedures, selection of contractor for building work / project, pre-qualification of contractors, letter of Intent / "Works order" to the Contractor.
- Articles of Agreement and Conditions of Contract. (Study of conditions stipulated by I.I.A., Price Escalation).
- Site visit reports and instructions.
- Introduction to architectural supervision, quality control and monitoring of projects, with the help of Bar Charts / CPM / Pert Charts.
- Introduction to 'Arbitration'.

TERM – WORK

Term Work to comprise of the following exercise/s

Minimum three hand-written tutorials on all aspects covered in the 'Course outline' above.

RECOMMENDED READINGS :

(1) Private Architectural practice – by Manrice E. Tayler
(2) Architectural Practice and Procedure – by Hamilton H. Turner.
(3) Professional Practice in India – by Madhav G. Deobhakta
(4) Professional Practice – by R. H. Namavati
(5) Architect's Act 1972
(6) Council of Architecture and I.I.A. Publications relevant to the 'Course outline above'.

Subject Code : **413432 DISSERTATION AND ARCHITECTURAL PROJECT (PART I)** (Sessional)			
TEACHING SCHEME		**EXAMINATION SCHEME**	
Lecture Periods per week	01	Term I and Term II Sessional (Internal) Sessional (External) Viva	 50 marks (for each term) 50 marks (for each term) nil
Studio Periods per week	02	Total sessional marks for both terms	200 marks
Total Contact Periods per week	03	Paper	nil
		Total Marks	200 marks

AIM :

The subject of Dissertation is included in the syllabus with the intention of introducing the students to the process of conducting systematic research in the subject of their choice but in the overall Architectural Context and acquainting them with the research methodologies adopted while carrying out research in a particular subject. The students are expected to get an orientation in Technical Writing which is an emerging field for making a career. The Dissertation is expected to impart initial training at undergraduate level so as to prepare them for more advanced research at postgraduate level.

The topic of research should relate to the "Architectural Project" that the student intends to undertake. This will help the student to extend the findings of the research to the architectural design.

COURSE OBJECTIVES:

1. To introduce the students to research in architecture and its significance in the architectural practice.
2. To introduce the students the types of research in architecture and the process of formulating a research plan.
3. To introduce the students to various methods of research in architecture, their relative advantages and disadvantages and their applications.
4. To introduce the students to data analysis and simple statistical analysis and to interpret and infer from the data.
5. To introduce the students to the technical writing and presenting a research report.

COURSE OUTLINE: TERM I

Introduction to research in architecture – its significance, research design, types of research, literature study, methods of research in architecture (interviewing / visual methods / content analysis); data documentation and analysis, introduction to statistics, presenting the data and reporting the research.

TEACHING PLAN:

The course outline has been compiled into 8 units which have to be communicated in the form of lectures to the students to achieve the objective of acquainting the students with the research methods and the process of research. The amount of time in weeks required for each unit is mentioned in parenthesis. Approximately 15 weeks are required for covering the

units.

It is recommended that units 1 to 4 shall be covered in the earlier part of term I of the year. By knowledge of the methods of research and having introduced to the research design, students can undertake the research design and primary data collection after initial 8 weeks of the term. Units 5 to 8 can be covered in the earlier part of term II of the year by demonstrating these units using the data collected by the students.

TERM I:

Unit 1 Introduction (2 week)

Introduction to "research" and its significance in architecture – meaning of research. Relationship between design and research. Types of research in architecture, areas of research in architecture, qualitative and quantitative paradigms.

Unit 2 Research Design (2 weeks)

Components of research design – formulating the research questions, hypothesis, choosing the sample, methods of data collection, analyzing the data and inferring from the data. Concepts of dependent and independent variables, unit of analysis. Defining the scope and limitations of a research plan, significance of the research outcome. Preparing time schedule & budget for a research plan.

Unit 3 Literature Study and Research (1 week)

Significance of literature study in research, different sources of information such as books, journals, newspapers, internet, magazines, audio recordings, etc. Referencing and documenting the bibliography.

Unit 4 Methods of Research in Architecture (3 weeks)

Interview Techniques : Questionnaires /Face to face Interviews / Internet survey. Designing a Questionnaire / Interview schedule.

Visual Techniques : Observations (participant / non participant / direct), activity mapping, accession/erosion trace observations, cognitive maps, etc.

Content Analysis : Secondary data analysis.

Understanding the relative advantages, disadvantages and application of various methods mentioned above and choosing a method appropriate for a research to achieve its objectives.

TERM II:

Unit 5 Data Documentation and Analysis (2 weeks)

Understanding the nature of data collected and methods of analysis suitable for that data (graphical / numerical / descriptive). Converting data into numerical form for data analysis.

Unit 6 Introduction to the Statistics (3 weeks)

Introduction to the simple statistical methods of analyzing numerical data – frequencies / percentages, mean / median / mode, correlation, chi square test – inferring from the data and interpreting the meaning of those inferences. Use of MS Excel for statistical data analysis.

Unit 7 Presentation of the Data (1 week)

Techniques of presenting the numerical data – graphical (pie charts, bar charts, line graphs etc.), tabulations, verbal qualitative data, architectural drawings / maps.

Unit 8 Reporting the Research (1 week)

Different sections of a research report, technical writing and language (tense, voice,etc.), formatting of a report.

SESSIONAL WORK:

1. A **Class test** based upon the units 1 to 4. (20 % of total marks) to be conducted at the **end of term I.**
2. Writing a **review essay** of about 1000 words on any one book / part of a book (chapter) related to architecture, read by the student. (10% of total marks) in **term I**.

3. Undertaking **research on a topic** (for Architectural Project approved by the University of Pune).
   a. Approach to research, research design (20% of total marks)
   b. Field work (data collection) and Analysis of the data (20% of total marks)
   c. Report writing and presentation (30% of total marks).

   Phases (a) above can be assessed in term I while phases (b) & (c) above, will be essentially assessed in the term II.

SUBMISSION, CHAPTERS AND FORMAT OF THE REPORT (Architectural Project Part I):

Candidates must submit three copies of the report duly signed and endorsed by the Principal and the Guide to their respective colleges. Following is a brief guideline for the sections / chapters in the report and the formatting of the report.

1. **The report will have three main parts** :
   a. Initial Pages –in the following sequence.
      i. Title Page.
      ii. Certificate from the College
      iii. Acknowledgement.
      iv. Table of Contents
      v. List of figures, photos, drawings, tables. vi. List of abbreviations
   b. Main body of the report (not to exceed 4000 words).
      i. Introduction
      ii. Literature review
      iii. Methodology
      iv. Data Analysis and Findings
      v. Conclusions and Discussions
      vi. Recommendations / Design Guidelines
      vii. Glossary
   c. Appendices

2. **Formatting of the report**
   a. The report shall be presented in A4 Portrait form using executive bond paper. b. The font to be used shall be either **Bookman Old Style** or **Times News Roman.**
   c. **CHAPTER TITLES** : 16 point upper case bold, **Sub□headings** : 14 point title case bold and overall text shall be in 12 point sentence case.
   d. Line Spacing shall be 1.5 lines.
   e. Page numbers shall be given at the bottom centre of a page. The initial pages (as in 1 above) should have roman small numerals (i, ii, iii etc.) while the body of the report and appendices shall have English numerals (1,2,3 etc.)
   f. Margins : Left Margin 40mm (1.5 inch approx) All other margins 25mm (1 inch approx).
   g. Report shall be typed on one side of the page.
   h. Black binding with Golden Embossing.
   i. Standard conventions for giving references, writing bibliography, annotating figures /tables shall be followed.

RECOMMENDATIONS:

Topic for Research: The topic of research should be related to the "Architectural Project" that the student intends to undertake. This will help the student to extend the findings of the research to the architectural design. In this manner, the effort for dissertation would become focused, directional and relevant. The choice of subject shall depend upon many factors such as student's personal interest, circumstances and abilities. A careful check shall be made to see that access is available to relevant buildings and to appropriate libraries,

record offices, laboratories and other technical resources. Thought must be given to any travel, and field trips, which may be necessary.

Thus coordination between "Dissertation" and "Architectural Project" at the college level is very essential and an over view meeting with the students should be arranged at the end of the third year B.Arch. Depending upon the philosophy of a particular college, the college may allow topics focusing upon a particular area related to their mission statement.
Following is a list of some Building Types for reference.

1.Housing: Individual or Group Housing Schemes.
2.Transportation Projects: Railway stations, City / Interstate Bus Terminus / Domestic and International Air Ports.
3. Cultural, Educational Projects
Display oriented topics like Museums, Art Galleries, and Theatres for Performing Arts such as Drama, Dance and Music. University and College campuses, Libraries etc.
4. Sports Recreation and Tourism oriented topics
Stadium, Gymnasium, Swimming Pool, Students Recreation Centers, Clubs, Tourist Resorts, Holiday Homes, Motels, Conference Centers etc.
5. Administrative and Civic Buildings:
Private and Government Offices, work centers, Town Halls, Police Headquarters, Law Courts etc.
6.Industrial Projects:
Factories, Specialised Production Centers such as Pharma Industry, IT Parks and related types of building
7.Technical and Specialized topics such as Hospitals, Clinics, Film and T. V. Studios, Cost and Structure oriented topics such as cost effective technologies, Energy efficient building design, Pre fabricated and Industrialized Construction etc.

Guide : The guides for the dissertation should have minimum 5 yrs. of teaching experience as full time faculty member at an architecture college or shall be a visiting faculty member / practitioner with at least 10 yrs experience. Preferably, a guide should not guide more than 8 students for the dissertation.
The dissertation coordinator at a college, should deliver research methods lectures and at times call experts from the field of architecture to review students' work, experts from other fields to give special inputs such as technical writing, statistical methods etc.

RECOMMENDED BOOKS:

1. Babbie, E. *The Practice of Social Research*, (third edition). Belmont :Wadsworth Publishing Co. 1983.
2. Creswell, J. W. *Research Design: Qualitaitve, quantitative and mixed methods approaches*, 2nd Ed., Thousand Oaks : Sage. 2003.
3. Creswell, J.W. *Research Design: Qualitative & Quantitative Approaches*. Thousand Oaks : Sage.1994.
4. De Vaus, D. A. *Surveys in Social Research*, Jaipur : Rawat Publications. 2003.
5. Dey, I. *Qualitative Data Analysis : A User Friendly Guide for Social Scientists,*London : Routledge.1993.
6. Groat, L. & Wang, D. *Architectural Research Methods*, NY : John Wiley and Sons Inc. 2002.
7. Kothari, C.R. *Research Methodology : Methods and Techniques*, New Delhi : Wishwa Prakashan. 2005.
8. Nachmias, C. F. and Nachmias, D. *Research Methods in the Social Sciences*, 5th Edition Great Britain: St. Martin's Press Inc. 1996.
9. Norman K Denzin and Yvonna S Lincoln (Eds.) *Handbook of Qualitative Research*, Thousand Oaks : Sage Publications, pp. 377□392. 1994.
10. Patton, M. Q. *Qualitative Evaluation Methods*, Newsbury Park : Sage Publications. 1980.

11. Sanoff, H. *Methods of Architectural Programming*, Dowden Hutchinson and Ross, Inc. Vol. 29, Community Development Series. 1977.
12. Sanoff, H. *Visual research methods in design*, USA : Van Nostrand Reinhold. 1991.
13. Silverman, D. *Interpreting Qualitative Data : Methods for Analysing Talk, Text and Interaction*, London: Sage Publication. 1993.
14. William Michelson (ed.) *Behavioral Methods in Environmental Design*, Stroudsberg, Pennylvania : Dowden Hutchinson and Ross.
Inc. 1982.

Subject Code : **413454 CONSTRUCTION MANAGEMENT THEORY & PRACTICES** (Sessional)			
TEACHING SCHEME		**EXAMINATION SCHEME**	
Lecture Periods per week	01	Term I and Term II Sessional (Internal) Sessional (External) Viva	 25 marks (for each term) 25 marks (for each term) nil
Studio Periods per week	01	Total sessional marks for both terms	100 marks
Total Contact Periods per week	02	Paper	nil
		Total Marks	100 marks

AIM:
Study of this subject is aimed at teaching the students the advanced and more complex aspects of construction management. It also aims at making students aware of systems and techniques of construction used to handle construction projects.

COURSE OUTLINE: TERM I

- Introduction to planning of construction project and management
- Construction Industry-types of construction, construction practice, project management constructional organization, delegation of responsibilities, Role of Architect, Engineer and Contractor.
- Objectives and functions of project management, stages of project management (planning, scheduling and organising)

COURSE OUTLINE: TERM II

- Study of Bar Charts, Mile Stone Charts and its applications in construction project, Work Break Down schedule.
- Introduction to PERT (Project Evaluation & Review Technique), Probability, Standard deviation.
- Fundamentals of CPM (Critical Path Method) activity, event, float, network construction, time computation, project completion period, resource allocation and levelling; Relationship of Work, Time & Cost, Cost Analysis in network planning, construction site practices, Inspection and Quality Control

TERM – WORK
Term Work to comprise of the following exercise/s
Minimum three hand-written tutorials on all aspects covered in the 'Course outline' above.

RECOMMENDED BOOKS:

- Construction Project Management - K.K. Chitkara.
- Construction Management - P.K Joy.
- Techniques in Planning and controlling construction projects. - Hira N. Ahuja