Savitribai Phule Pune University

(Formerly University of Pune)

Syllabus for Ph.D. (PET) Entrance Exam : Architecture

Research Methodology

1. Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific methods, understanding the language of research, Concept, Construct, definition, Variable. Research Process

2. Problem Identification & Formulation, Research Question–Investigation Question Measurement Issues.
   Hypothesis–Qualities of a good Hypothesis-Null hypothesis & Alternative Hypothesis. Hypothesis Testing–Logic & Importance–Logic & Importance

3. Research Design: Concept and Importance in Research, Features of a good research Design: Exploratory Research Design, concept, types and uses, Descriptive Research Designs: concept, types and uses. Experimental Design: Concept of Independent & Dependent variables.

4. Qualitative and Quantitative Research: Qualitative research, Quantitative research, concept of measurement, causality, generalization, replication. Merging the two approaches. Types of data and data collection techniques

5. Measurement: Concept of measurement -what is measured? Problems in measurement in research –Validity and Reliability. Levels of measurement –Nominal, Ordinal, Interval, Ratio.

6. Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample. Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Determining size of the sample –Practical considerations in sampling and sample size.

7. Data Analysis: Data Preparation –Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis –Cross tabulations and Chi square test including testing hypothesis of association, Analysis of Variance (ANOVA)

8. Interpretation of Data and Report writing: Types of publication, Paper Writing, Layout of a Research Paper, Journals in Science, Impact factor of Journals, When and where to publish ?
   Ethical issues related to publishing, Plagiarism and Self Plagiarism.

9. Use of Encyclopedias, Research Guides, Handbook etc. Academic Databases, Patent database, e-information

10. Research tools: methods to search required information effectively, Reference Management Software like Zotero/Mendeley, Software for paper formatting like LaTeX /MS Office , Software for detection of Plagiarism

Subject Concerned Syllabus
Architecture

1. Architecture

1.1. Architectural planning and design

- **Architectural Theory and Aesthetics:** Basic concepts of design, form space, aesthetics, isms in architecture.
- **Architectural history, heritage and conservation** – Architectural history of Europe and Indian sub-continent, regional architecture of India, modern movement, contemporary architecture across the world. Steps in architectural conservation.
- **Site Planning, Landscape and Urban design** – Principles of landscape design and site planning, landscape elements and materials, environmental considerations in landscape planning. Significance of urban design, process of urban design, imageability, universal design, aesthetics, behavioural aspects.

1.2. Environmental Studies

- **Man-Environment relationship** – Resource depletion, pollution, resource management, bio-geochemical cycles, urban ecology, global warming, climate change, Urban environmental issues, solid waste management, water conservation., Climatic considerations, building climatology, indoor environmental quality,
- **Environmental Impact Assessment** – Social, economic and ecological. Techniques and tools.Energy efficiency and Green Building Technology – Norms, standards, rating and evaluation.
- **Disaster Management** – Natural and manmade disasters, disaster risk management, planning and design responses.

1.3. Building Science & Technology

- **Construction Technology & Materials**– Structural design methods and techniques, seismic design considerations, long span structures, high rise construction, pre-fabricated construction, tensile construction, green building materials, properties and applications of various materials, non-conventional materials and techniques.
- **Building services** – Drainage and water supply at site level and city level, acoustics, fire fighting, natural and mechanical ventilation, lighting and illumination.

- **Transportation Planning** – Traffic sign and signal design, theory of traffic flow, intersection design, integrated transportation planning and modal splits.Modular coordination, construction techniques and materials, Digital Architecture concepts.

2. Professional Practice and Management:

Nature of profession, difference between trade, business and profession.
Professional organizations like I.I.A., COA & their membership ,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. Building byelaws, national building code, architects' act.

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. 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. **B**uilding contracts and tendering procedures.

Project Management – PERT, CPM, Supply chain management, quality, control, safety issues on sites. Architectural supervision, quality control and monitoring of projects. Introduction to 'Arbitration'
Intellectual Property rights and patents. Tools of IPR and patentability aspects interventions and innovations.

3. Computer Application in Architecture

- Advanced computer graphics and information system: Computer systems and languages. Computer organization, computer peripherals, software/Hardware concepts.
- Introduction to workstation. Concepts and working knowledge of application and the usage of software for word-processing, spreadsheets etc.
- Introduction to computer aided design (CAD) and GIS, software like, sketch up, wire frame, modeling photo shop, work things, In-design, Ravitetc .
- BIM for Construction.

4. Architectural Research

- **Research Basic concepts :**Meaning , objectives and motivation. Types of research in architecture. Role and importance of theory in research, ethics.
- **Research Process**: Research problem , research question, Literature Survey, data review and sourcing.

- **Research Methods and Methodology:** Qualitative and quantitative research and it application in architecture. Types of data, Data collection and processing techniques, Data analysis and interpretation of findings.
- **Research Design :**research approaches and paradigms. Variables, Sampling,
- **Visual and behaviouralresearch in architecture :** Introduction to Environmental Behavioural Studies in Architecture, EBS Origins and Issues
- Environmental Perception, Cognition, and Meaning, Socio-cultural Dimensions of Environment/Behaviour Relationships
- **Reporting Research**: Dissertation/thesis, Abstract, synopsis, SOP, structure, citation and referencing, Scholarly research papers.