**GUJARAT TECHNOLOGICAL UNIVERSITY**
**BRANCH NAME: B. Arch**
**SUBJECT NAME: Architectural Research and Programming**
**SUBJECT CODE: 2X95003**
**5th Year: Semester-IX**

**Pre requisite**: The course requires basic understanding of the methods of inquiry, site investigation and collecting information as a scholarly activity.

**Rationale:** This course introduces students to architectural research as both a professional and scholarly activity, which constitutes systematic inquiry as a means of answering questions related to the creation of the built environment. It provides an overview of theories and methods that seek to clarify the relationship between people and places and a range of techniques on gathering, assessing, interpreting, and comparatively evaluating relevant information for such an inquiry.

**Teaching and Assessment Scheme:**

| Teaching Scheme | | | Credits | Examination Marks | | | | Total Marks | University Exam Type |
|---|---|---|---|---|---|---|---|---|---|
| Field work | Lectures | Studio | C | Theory Marks | | Practical Marks | | 100 | Theory Exam |
| 1 | 2 | 1 | 4 | ESE (E) | PA ( M) | ESE(V) | PA (I) | | |
| | | | | 50 | 50 | 00 | 00 | | |

**Content:**

| SR. No. | Content | Total Hours | Weightage |
|---|---|---|---|
| 1 | **Foundations of Research**: Meaning, Objectives, Motivation, Utility. Concept of theory, Characteristics of scientific method – Understanding the language of research – Concept, Construct, Definition, Variable. Research Process | 12 | 20 % |
| 2 | **Problem Identification & Formulation** – Research Question – Investigation Question – Measurement Issues – Hypothesis – Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis. Hypothesis Testing – Logic & Importance | 08 | 10 % |
| 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 | 12 | 20 % |
| 4 | **Qualitative and Quantitative Research**: Qualitative research – Quantitative research – Concept of measurement, causality, generalization, and replication. Merging the two approaches.<br>**Measurement**: Concept of measurement– what is measured? Problems in measurement in research – Validity and Reliability. Levels of measurement – Nominal, Ordinal, Interval, Ratio.<br>**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. | 12 | 20 % |

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|---|---|---|---|
| 5 | **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.<br>Interpretation of Data and Paper Writing – Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish ? Ethical issues related to publishing, Plagiarism and Self-Plagiarism. | 08 | 10 % |
| 6 | **Use of tools / techniques for Research**: 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. | 12 | 20 % |

*: indicative

**References:**


1. Architectural programming, Kumlin, Robert R
2. The architect's guide to programming, Palmer Mickey A.
3. The impact of the client organizationon the programming process, Faberstein,Jay(Edited• by Wolfgang Preiser, Van Nostrand Reinhold)
4. Architectural programming: Information Management for Design Duerk, Donna P. (Van• Nostrand Reinhold)
5. Behavioral Research Methods in Environmental Design Michaelsin, William Hutchinson• Ross)
6. Problem seeking: An Architectural Programming primer Pena, William M. (AIA Press)
7. Business Research Methods – Donald Cooper & Pamela Schindler, TMGH, 9th edition
8. Business Research Methods – Alan Bryman & Emma Bell, Oxford University Press.
9. Research Methodology – C.R.Kothari


**List of Projects/Assignments*:**

Lectures/Tutorial work shall consist of presentations on various topics of the subject. AV projects may be introduced to students for documenting best practices and advances through case studies. A group discussion or forum may be organized for discussion on various aspects of the subject.

*- this is suggestive for common purpose. Faculty may decide on this, considering student group and institution philosophy.