

**IIT Mandi**  
**Proposal for a New Course**

**Course number** : IK 509  
**Course Name** : Research methodology  
**Credit Distribution** : (1-0-0-1) (*Lectures-Tutorial-Practical-Total credits*)  
**Intended for** : MTech(R) and PhD students  
**Prerequisite** : None  
**Mutual Exclusion** : None

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**1. Preamble:**

Research methods and statistics are the foundation for scientific research. This course would enable the students/research scholars working on Indian knowledge systems and mental health applications (IKSMHA) to understand the concepts better from a Indian Knowledge system and mental health perspective.

**2. Course Modules with quantitative lecture hours (14 hours)**

**Research Philosophies and paradigms (1 hour)**

Six systems of Indian Philosophy- Introduction  
Research paradigms in Indian philosophical system  
Eastern & western paradigms-critical overview

**Research Ethics (1 hour)**

Ethics from Indian knowledge system perspective (IKS)  
Evolution of human research ethics

**Literature review and referencing (1 hour)**

Review of classical scriptures of Indian philosophy  
Relevant modern science literature review

**Sampling methods (1 hour)**

Non-probability sampling methods  
Probability sampling methods

**Research designs (1 hour)**

Experimental designs  
Non-experimental designs

**Clinical trial and control techniques (1 hour)**

Confounders and control techniques

Controlled clinical trials (CCT)

**Logic of hypothesis testing (1 hour)**

Null hypothesis significance testing (NHST)

Steps of hypothesis testing

**Data collection methods (1 hour)**

Measurement errors and bias

First person subjective methods

Third person objective methods

**Procedure for conducting research (1 hour)**

Ethics committee approval

Clinical trial registration

Informed consent/assent

Pilot study- need and importance

Protocol- apriori design vs interim modifications

Managing adverse effects

**Fundamentals of qualitative research (1 hour)**

Major qualitative research approaches

Validity & reliability in qualitative research

**Technical software for Research scholars (1 hour)**

Itranslator- for Sanskrit transliteration

R & Jamovi-for statistical analysis

Zotero-for referencing

**Statistics overview-1 (1 hour)**

Descriptive statistics

Fundamentals of inferential statistics

**Statistics overview-2 (1 hour)**

Choosing the right statistical tests

**Scientific writing (1 hour)**

Classical scriptures perspective

Modern science perspective

### 3. Text books:

Aron A, Aron EN. Statistics for psychology (6<sup>th</sup> Ed). Pearson Education; 2013.

Gough AE, Cowell EB. The Sarva-Darsana-Samgraha: Or, Review of the Different Systems of Hindu Philosophy. DigiCat; 2022.

### 4. References:

Zar JH. Biostatistical analysis. Pearson Education India; 1999.

Creswell JW, Poth CN. Qualitative inquiry and research design: Choosing among five approaches. Sage publications; 2016

Radhakrishnan S, Moore CA, editors. A source book in Indian philosophy. Princeton University Press; 1957.

### Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.		HS550	Hypothesis testing	5%
2		HS 522	Literature review & Hypothesis formulation	5 %
3		IK 506	Literature review, Hypothesis testing, Research designs	20%

### 6. Justification of new course proposal if cumulative similarity content is >30%: