Title-   Research Methodologies.

Purpose- This course is one of the common courses that will train the Ph.D. student to do research efficiently.

Need of the course - It is observed that most of the Ph.D. entrants are ill equipped to understand the philosophy behind the research. These students typically ask the supervisor to provide them with some 'problem' for Ph.D. Here, the 'problem' means some kind of work which is not being carried out elsewhere. The real motivation that lies in understanding the difficulties faced in social, medical, defence context are not perceived. As a result, the student is trained in finding holes in the current research and fill them up with some publications. It is necessary to motivate the student to know what real problems are and why the research is needed there. The present course will help student develop the right concepts about research. Further, it is observed that many of the statistical techniques which are important in almost all the sciences for data analysis, are not followed while analysing the results. Thus, appropriate statistical analytical methods are important in analysing the data reliably. Structure of the course – The course is structured in to different modules. A given faculty is expected to choose certain modules suitable to their need. The contents are largely case based so that student understands the practical workability of the course.

Syllabus – Module I - History of research. Indian, Egyptian, Greek ideas methodologies and research in agriculture, chemistry, metallurgy, medical. Ancient Indian research methodology applications.   10Hr

Module 2 - (Recommended for science, technology, engineering, economics, management, archaeology, behavioural science) Statistical analysis and its significance. , Exploratory and confirmatory research, Planned and ad-hoc methods of data collection, Non-response and methods of recovering the missing response, Various softwares for statistical analysis. The module will consist of case studies of the research performed in various subjects using statistical methods,. Error and noise analysis, curve fitting.   10Hr

Module 3 – (Recommended for arts, performing arts, languages, commerce) Creating questionnaire. Data analysis from answers, Selection of research topic (case study based). Selection of research topic (case study based),   10Hr

Module 4 – Literature search, selection of research topic (case study based), maintaining laboratory records (case study based). Safety in Laboratories, Ethical considerations, effective verbal and non verbal communication, field data collection, safety in field.
10 Hr

Module 5- Writing research paper and/or thesis, making a presentation, writing a research proposal, and patents in Science, technology.   10 Hr

Module 6- Writing research paper and/or thesis, making a presentation, writing a research proposal in arts, management, commerce faculty.   10Hr.

A student will choose 4 suitable modules depending on his/her faculty. The contact hours will be around 60 based on assignments and examinations. The examination for each module will be separately performed.

References:

1) 'History of the Scientific Methods' by Martin Shuttleworth, https://explorable.com/history-of-the-scientific-method.

2) 'The Statistical Analysis of Experimental Data' by, John Mandel, ISBN: 0486646661, ISBN13: 9780486646664

Mode of examination-

The internal examination for each module will be separately conducted. The examination mode is decided by the instructor of that module.

The external examination will be conducted at the time of 4rth half yearly progress review. The student's implementation of various aspects in research methodologies will be checked.