

# JEE 613 Research Methodology (3 credits)

## Course Outline

### **Course Objective**

This course gives students practice in the general skills needed in scientific and technical research. The emphasis is on clear thinking and accurate representation of research facts through short practical homework exercises.

- Searching for information in the literature.
- Reviewing previous research.
- Making proposals for new research.
- Measurements and the analysis of numerical data.
- Describing equipment and experimental methods.
- Good practice and ethics in research.

### **List of topics week by week**

1. Measurements, units, dimensions, significant digits.
2. Discussion of contents and writing titles for technical reports.
3. Fitting mathematical formulas to numerical data.
4. Reviewing articles by writing summaries organized into paragraphs.
5. Performing and writing up a home experiment.
6. Making an oral presentation.
7. Student presentations.
- 8. Mid term exam.**
9. Statistical analysis of numerical data.
10. Logical explanation of how something works, or the application of a theory.
11. Mathematical modeling.
12. Writing a proposal for a research experiment.
13. Home experiment (a second exercise similar to 5 above).
14. Ethics and good practice in research..
15. Student presentations (a second exercise similar to 7 above).
- 16. Final exam.**

### **Textbook**

**Research Methodology** by R. H. B. Exell, Published by Technical Information Services, KMUTT, for JGSEE