Course Code : **ME 711**

Course Title : **Research Methods in Mechanical Engineering**

Credit Hours : **3**

Course Description

Nature of mechanical engineering research, Formulation of the research problem, Literature review and technical writing, Presentation skills, Research methods and research design, Statistical analysis, Advanced statistical topics, Modeling techniques, optimization and simulation and IT applications, Research validation, Error analysis.

Course Objectives

To provide an understanding of the main research methods used in Mechanical engineering and develop the necessary knowledge and skills for pursuing research projects, theses or dissertations.

Course Topics

Week no. 1: Nature of mechanical engineering research.

Week no. 2: Formulation of the research problem.

Week no. 3: Literature review and technical writing.

Week no. 4: Presentation skills.
Week no. 5: Research methods and research design.

Week no. 6: Research methods and research design.

Week no. 7: Statistical analysis. / 7th week evaluation.

Week no. 8: Statistical analysis.

Week no. 9: Statistical analysis.

Week no. 10: Advanced statistical topics.

Week no. 11: Modeling techniques, optimization and simulation and IT applications.

Week no. 12: Research validation / 12th week evaluation

Week no. 13: Error analysis.

Week no. 14: Error analysis.

Week no. 15: Error analysis.

Week no. 16: Final Examination.

References

- Tan, W.: “Practical Research Methods”, Pearson Prentice-Hall, New York, 2004.
- Cramer, D.: “Advanced Quantitative Data Analysis” Open University Press, McGraw Hill Education, 2003.
- Bryman, A and Cramer, D: “Quantitative Data Analysis with SPSS Release 12.0”, Routledge, London, 2004.
- Sree Ramulu, U.S.: “Thesis Writing” Oxford and IBH Publishing, New Delhi, India, 1988.
- Taylor, J.R.: “An Introduction to Error Analysis- The Study of Uncertainties in Physical Measurements”, USA, 1982.