Course Syllabus for M.Sc. in Energy for Sustainable Social Development

**Research Methodology**

(CORE COURSE 4)

Lecture: 2 hrs Year: I

Tutorial: 2 hrs Part: I

**Objective**:

The objectives of the course are to:

* Increase awareness of the role of research design and methodology in any enquiry process particularly for disciplines and postures that have both technological and social aspects;
* Introduce a range of research design and methodology options that span between the subjective and the objective, the natural and the social, the mathematical, the cultural or such like polarized capsules;
* Foster an appreciation of the strengths and weaknesses of the different options for particular research objectives;
* enable application of Ethnography, Questionnaire Survey and Case Study methodologies in field situation
* Analyze, critique and write a research report

After attending the course, the students will be able to bring a more critical reading to the literature and have acquired a basic knowledge of research design and methodology as a contribution to their project and thesis works on renewable energy solutions in collaboration with stakeholders. The student should be able to research design suitable to inform or solve the problem of his choosing and also execute it in credible and dependable ways on the socio-technical situation.The student will develop the ability to collect, structure, analyze and present information in logical form in order to make convincing arguments and well referenced and reasoned findings from research.

**Teaching and Examination Schedule:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S.N. | Teaching Schedule | | | | | | | Examination Scheme | | | Total | Remarks |
| Course Code | Course Title | Credit | L | T | P | Total | Theory | | |
| Assessment Marks  Fieldworks | Final | |
| Duration, hr | Marks |
| 4 | EG804ME | Research Methodology | 4 | 2 | 2 | 0 | 4 | 40 | 3 | 60 | 100 |  |

The course will be delivered basically in a lectures mode supplemented by field based tutorial and practice sessions - both with two contact hours weekly for a total of 15 weeks. Field work may be scheduled in consolidated block of one week. The lectures/discussions will be largely centered on research as a tool for and subject of conscious pursuit for knowledge building (in theory and application) and skill on research areas of disciplines and interests represented in the class and the course.

Evaluation: Cumulative assessments will be made of interactions, presentations and reports of assigned activities in tutorial classes. In addition, outcomes (written report and presentation) of field works will form important basis for internal evaluation. Attendance requirements will be as per TU regulations (minimum 75% of contact hours have to be attended for eligibility to sit for examination.

1. Introduction, nature and types of research, Qualitative and Quantitative approaches, language of research. Structure and processes of research (basic and applied research).Field research (2)
2. Building blocks of research (ontology, epistemology, methodology, methods, sources). Paradigms in social research (4)
3. Research and criticism, the research process (applied and basic research). Inductive and deductive logic. (2)
4. Literature Survey, Building theory for research. Referencing formats and standards. (2)
5. Research methodology and methods. Basics of Questionnaire Survey, Ethnography, Experiments, Case Study, Modeling and Simulations. Details, concentrated tutorials and fieldworks for Questionnaire survey, Ethnography and Case Studies(6).
6. Data analysis, interpretation and discussions. Tools in statistical analysis (SPSS software use). Methods of Inference and conclusions drawing.(4)
7. Research Proposals, Research reports: contents, formats and components, writing approaches.(4).

**References and Texts:**

Rossi, P.H., Wright, J.D. & Anderson, A.B. 1983, *Handbook of Survey Research*, Academic Press Inc., London.

McQueen, R. & Knussen, C. 2002, *Research Methods for Social Science*, Prentice Hall.

Jonker, J. & Pennik, B. 2002, *The Essence of Research Methodology*, Springer.

Polonsky, M.J. & Waller, D.S. 2005, *Designing and Managing a Research Project*, SAGE Publications, Thousand Oaks.

Yin, R.K. 1994, *Case Study Research*, SAGE Publications, Thousand Oaks.

Groat, L. & Wang, D. 2002, *Architectural Research Methods*, John Wiley & Sons, Inc., New York.

Alasuutari, P., Bickman, L., Brannan, J. & Brannen, J. 2008, *The SAGE Handbook of Social Research Methods*, SAGE Publications, London.

Field, A. 2009, *Discovering Statistics using SPSS*, 3rd edn, SAGE Publications, London.

Miles, M.B. & Huberman, A.M. 1990, *Qualitative Data Analysis*, SAGE Publications, Beverly Hills.

Creswell, J.W. 1994, *Research Design: Qualitative and Quantitative Approaches*, SAGE Publications, Thousand Oaks.

McGarth, R.E. 1997, *Understanding Statistics: A Research Perspective*, Longman, New York.