

Course Code : ENCM 42542
Title : Research Methodology and Scientific Writing
Pre-requisite : ENCM 41512
Co-requisite : None
Status : Theory, Compulsory

Learning outcomes:

After completion of the course unit, the student will be able to;

- describe the sequential steps in the research process,
- explain a range of research methodologies used in scientific investigations and discuss the applicability of these methodologies in environmental science research,
- demonstrate competencies in using different sampling strategies in environmental investigations,
- explain the procedure of developing a research proposal for solving an identified research problem,
- identify the stipulated requirements for scientific writing of a dissertation, research papers, abstracts/extended abstracts for research conferences,
- quote references appropriately in the scientific documents based on stipulated requirements, and
- identify ethical issues in the context of research.

Course content:

Nature of scientific research: Inductive and deductive reasoning; scientific method; Sequential steps in the research process, Locating scientific literature using electronic search engines, Reviewing scientific literature, Formulating a research problem and postulating hypotheses; Conceptualizing a research design and data collection methods; Introduction to populations, samples, sampling units; Sampling techniques; simple random sampling, stratified sampling, systematic sampling and cluster sampling, determination of sampling size, Research designs based on number of contacts, reference period, and nature of investigation; Research methods in pure and applied sciences, descriptions, comparative studies, experiments modeling, surveys, case studies, meta-analysis; Experimental design; Complete Randomized Design and Randomized Block Design, Latin Square design.

Compiling a research proposal for solving the identified research problem, Scientific writing for dissemination of research findings: Academic writing, Formatting and Referencing requirements Effective presentation methods; Guidelines for writing a dissertation, Guidelines for writing a research paper, guidelines for preparation of abstracts and extended abstracts for presentations at research conferences/symposia.

Research ethics: Role and responsibilities of being a researcher, honesty and integrity; Ethical concerns related to the research process, Ethics of publication of research findings.

Method of teaching and learning:

A combination of lectures, computer based learning, assignments, self-studies, presentations and discussions.

Assessment:

In-course assessment and end of semester examination.

Recommended reading:

1. Creswell, J. W. (2009). Research Design. Sage Publications Inc. California.
2. Hofmann, A. H. (2009). Scientific writing and communication: Papers, proposals and presentations, Oxford University Press.
3. Kumar, R. (2005). Research Methodology, Pearson Education, Australia.