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| **School of Civil & Environmental Engineering, AAiT, AAU** | | | |
| Course Code | CEng7901 | | |
| Course Name | Scientific Research Methods | | |
| Program | MSc. in Geotechnical Engineering | | |
| Course Instructor | Samuel Taddesse (PhD), Henok Fikre (PhD) | | |
| ECTS Credits | 5 | | |
| Target Group | Regular 2012 Entry Geotechnical Engineering Major | | |
| Objectives | * To provide an opportunity for students to establish or advance their understanding of research through critical exploration of research language, ethics, and approaches in the context of Geotechnical Engineering. * To introduce the language of research, ethical principles and challenges, and the elements of the research process within quantitative, qualitative, and mixed method approaches. * To allow students begin to critically review literature relevant to their theses and determine how research findings are useful in forming the understanding of their work, social, local and global environment. | | |
| General  Competency | **Knowledge**   * Demonstrate fundamental knowledge of the essence of research. * Understand research terminologies * Be aware of the ethical principles of research, ethical challenges and approval processes * Describe quantitative, qualitative and mixed methods approaches to research * Identify the components of a literature review process * Be able to critically analyze published research   **Skills**   * Grasp elementary capacity of statistical data handling tools. * Develop and sharpen technical writing skills.   **Attitude**   * Demonstrate individual and team work ethics, professionalism and respectful interaction with both instructor and students during the course work & projects. * Reflect upon the geotechnical engineering sub-discipline and its central position in the world of civil engineering. * Realize the cycle of research and become motivated to publish. | | |
| Evaluation | **Evaluation technic** | **Weight** | **Due** |
| Assignments | 40% | Each week |
| Attendance | MANDATORY | Minimum of 85% |
| Mini-research(s) | 20% | One week after class end |
| Mini-project | 10% | One week after class end |
| Final exam | 30% | End of course |
| Reference  Literature | Abiy Z., Alemayehu W., Daniel T., Melese G., Yilma S., Introduction to Research Methods, Preparatory Module for Addis Ababa University graduate programs, 2000.  Kothari C.R., Research Methodology: Methods and Techniques, 2nd Revised Edition, New Age International Publisher, 2004. | | |

**Content**

**Unit 1: The Concept of Research**

Lesson 1: Sources of Knowledge

Lesson 2: Definition and Purposes of Research

Lesson 3: Philosophy of Research

**Unit 2: Types of Research**

Lesson 1: Classification of Research

Lesson 2: Basic and Applied Research

Lesson 3: Descriptive, Explanatory and Exploratory Research

Lesson 4: Qualitative and Quantitative Research

**Unit 3: Process in Research Proposal Development**

Lesson 1: What is the Research Proposal?

Lesson 2: Components of Research Proposal

**Unit 4: Process in Conducting Research**

Lesson 1: Conceptualization

Lesson 2: Contextualization

**Unit 5: Research Ethics**

Lesson 1: The Basics

Lesson 2: Research Ethics Explained

Lesson 3: Codes and Policies for Research Ethics

**Unit 6: Reporting Research Findings**

Lesson 1: Writing a Scientific Report

Lesson 2: Oral Presentation