

# Addis Ababa Institute of Technology

## School of Civil Engineering and Environmental Engineering

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Course No. : **CENG 6902**

Course Name:– **Research Methods**

ECTS: **6**

Academic year: **2020**

Course Instructor: Esayas G. youhannes (PhD)

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## Course Description

As prospective graduate students, you are now embarking on a scientific journey. Through the course work of your graduate study, you have acquired sufficient know-how, and critical and analytical thinking to be able to frame your questions in a scientific context, as well as devise ways to systematically obtain answers to your questions. As a researcher (student ready to conduct research) you will be expected to adapt to standards and norms about what constitutes research, how research is conducted, and how research output is communicated. The main thrust of this preparatory module is to lay the foundation for the more rigorous training and research you will encounter upon joining your postgraduate program. In short, you will be able to conduct scientific research.

## Learning Outcomes

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Upon successful completion of the course, the student will:

- Able to identify research problems,
- Able to critically review published research papers and identify research gaps;
- Able to develop a research idea and prepare a research project brief;
- Able to design a research project/methodology on a topic of interest to them;
- Able to plan and execute a literature search on relevant topics; and
- Gain appropriate research and written presentation skills;
- Able to understand the world of publishing;
- Able to develop communication skills for networking with other researchers;
- Work in a sustained and systematic manner on a problem or set of related problems.

## Course outline

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The course will be delivered through lecture series supported by extensive discussion (during lecture time). This provides students with the opportunity to clarify their own ideas on the content material, to develop teamwork and necessary problem solving skills, and to develop written communication skills.

### **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: The Research Processes
- Lesson 2: The Research Processes Described

### **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

## Assessment

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The assessment in this course consists of a combination of written assignments, paper review, class quizzes and exam. At the end of the course students are expected to develop a full full-fledged research proposal to be defended at the end of the course. The research proposal will constitute major evaluation part of the course.

## Assignments

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The assignments will assess the ability of the student to assemble a range of materials gathered and present that material in a cohesive, coherent and condensed manner. It will also assess the ability of the student to Identify gaps, appraise and criticize works by other researchers, bring together knowledge gained throughout the course, develop efficient work methodology and set a clear direction to wards reaching the objective of a research. These assignments also develop research mentality, technical report writing, problem identification and problem solving skills. Students are encouraged to mutually critique their work before presentation, thus developing team skills.

## What is expected from Students

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The instructors' role in the delivery of the module content is limited to imparting basic ideas and concepts, answering or clarifying questions, and facilitating discussion forums. A substantial portion of the course delivery depends on your self-learning. To gain maximum benefit from this module you must:

- read ahead
- attend all lectures
- actively participate in the classroom
- do all exercises and assignments
- actively interact in discussion forums
- start writing the mini-proposal early
- revise and study for the final assessment exam