**E-COURSE**

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| Institution | Khovd University of Mongolia |
| Course name | Research methodology of sceinse |
| Credits | 3 ECTS |
| Course type | Common course (Required course)  |
| Lecturers | Unurnasan D. A.Amarjargal, B.Bayarkhuu |
| Level | MSc and PhD courses |
| Course duration | 16 weeks |
| Type | General skill |

Summary (main concept and understanding)

The structure of the course is based on two approaches. The first is a cumulative approach which introduces, step-by-step, the contents of the academic subject of research theory and practice. The second is concerned with the involvement of students in the practical work in order to develop the skills needed to produce a good quality of final product.

This course includes methods, techniques and processes of performing scientific research. This course is to provide students with the body of theoretical knowledge and practical skills of scientific work.

Key word (8-12 words)

Research foundation, research proposal, research approach, data collection, data analysis, interpretation of data, paper writing

Target audience

MSc and Ph.D. students in science.

Prerequisites

Required courses (or equivalents):

- Philosophy of science;

- Academic engish;

- Academic writing;

Aims and objectives

The aim of the curriculum is that the student shall gain solid knowledge and skills in research methodology in sciences.

The course consists of 4 modules with the following content: Foundations of research, Research proposal, Research approach and data collection and Interpretation of data and paper writing.

The course prepares students to design and execute an intensive research project. It covers elementary principles and philosophy of science; research planning, including preparation and oral presentation of study plans; communicating research findings; limitations of research techniques and professional scientific ethics.

The training aims to understand the basic definition of research methodology:

* To learn and understand the foundations of research;
* To learn and understand the the researcher's thinking;
* To learn and understand the research ethique;
* To learn and understand the the research problem and hypotheses;
* To learn and understand the research strategy;
* To learn and understand the the qualitative and quantitative approach;
* To learn and understand the data analysis;
* To learn and understand the preparing a research report.

learning outcomes:

After completion of this course, successful students will:

* Understanding of quality in research;
* Understanding of research design;
* Gain experience with data collection methods;
* Differentiate between types of research approaches;
* Differentiate between independent and dependent variables;
* Gain experience with ethics proposals;
* Вe able to write the thesis according to the requirements.

Applicable learning outcomes:

On successful completion of the course, students will be able to:

* Identify appropriate research topics;
* Prepare a literature review;
* Formulate and evaluate research questions;
* Develop a research proposal and be able to plan the research in the rational way;
* Search for, select and critically analyse research articles and papers;
* Carry out literature searches and acquire knowledge from scientific articles.

Overview of sessions and teaching methods

The course will be using interactive and self-reflective methods of teaching and learning and, where possible, avoiding standing lectures and presentations.

It will open with theoritical introduction to research work. The first part of this course has given about foundation of research work. The second part of the course will discuss a the research proposal.

 As the third part of the lecture, the students will study about research approach and data collection. In last module, about interpretation of data and paper writing.

Course workload

The course consists of 4 modules with the following content:

Module 1: Theoritical foundations of research work

Module 2: The Research proposal

Module 3: The Research approach and data collection

Module 4: Interpretation of data and paper writing

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| Activities | Learning outcomes | Assessment | Workload (hours) |
| In-class activities |
| Lectures | Understanding theories, concepts, methodology. It includes introduction to scientific research, research proposal and research approach and data collection | Class participation | 30 |
| Moderated in-class discussions | Understanding the research design. Comparison of research works | Class participation and preparedness for discussions  | 30 |
| In-class assignments | Understanding the research problems in а natural sciences. | Class participation and preparedness for assignments | 30 |
| Independent work |
| Paper review and discussion | Familiarity with an ability to critically and creatively discuss key concepts, tools, and methods as presented in the literature | Class participation creative and active contribution to discussion | 30 |
| Basic Concepts & Definitions | Understanding basic concepts and their application, components. It will include the data collection, calculations, report writing, and make the presentation. | Group discussion and self-work Individual report and presentations | 30 |
| **Total** |  |  | **150** |

Grading

The performance of the student will be assessed on the basis of the following: common

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| The final grade for the course is determined according to: **Forms of Control**  | **Weight, %** |
| In-class Student Performance  | 10 |
| Review note | 10 |
| Research proposal  | 20 |
| Surveys and assessment | 30 |
| Full report | 30 |

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| Assessment Scale: **ECTS**  | **University scale**  | **National scale**  |
| A  | 90-100  | excellent  |
| B  | 85-89  | very good  |
| C  | 75-84  | good  |
| D  | 65-74  | satisfactory  |
| E  | 60-64  | average  |
| FX | 35-59  | fail with a possibility of credit repass  |
| F  | 1-34  | fail with obligatory course repass  |

Course schedule

Lecturer D.Unurnasan, В.Bayarkhuu

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| **Class** | **Module** | **Topic** | **Duration** | **Type** |
| 1 | Theoritical foundations of research work:  | Introduction to scientific research | 90 minutes | Lecture |
| 2 | Researcher's thinking | 90 minutes |
| 3 | Research ethique | 90 minutes |
| 4 | Review of literature | 90 minutes |
| 5 | The Research proposal | Research problem | 90 minutes | Lecture, Group and self-work8 Discussion |
| 6 | Research hypotheses | 90 minutes |
| 7 | Research strategy | 90 minutes |
| 8 | Research design | 90 minutes |
| 9 | The Research Approach and data collection | Qualitative approach | 90 minutes | Lecture, Group and self-work, Discussion |
| 10 | Quantitative approach | 90 minutes |
| 11 | Mixed-Methods approach | 90 minutes |
| 12 | Sampling | 90 minutes |
| 13 | Measuring variables  | 90 minutes |
| 14 | Interpretation of Data and Paper Writing | Data Analysis | 90 minutes | Lecture, SeminarGroup and self-work,Presentation |
| 15 | Displaying Data | 90 minutes |
| 16 | Preparing a research report | 90 minutes |

Course assignments

Course assignment will constitute a multi-part project:

~Assignment #1 Module1: 6-8 pages of review note

~Assignment #2 Module 2: Developing model of research strategy; Evaluate a scientific design in a research work (according to the model)

~Assignment #3 Module 3: Surveys and assessment;

Literature-compulsory

1. Association, A. P. (2010). *Publication manual of the American Psychological Association.* (Sixth ed.). Washington, DC: American Psychological Association.
2. Bill Gilham. (2008). *Developing a questionnaire* (Second ed.). Real World research.
3. Larry B. Chistension; R.Burke Johnson; Lisa A. Turner. (2014). *Research method design, and analysis* (Eleventh ed.). Noida: Pearson India edition services Pvt.Ltd.
4. Ranjut Kumar. (2014). *Research methodology* (Fourth ed.). CPI group.
5. Жаргал, Г., & Сэлэнгэ, Н. (2018). *Судалгааны арга зүйд өөрөө сурах бичиг.*
6. Strunk, W., Jr. and White, E.B. *The Elements of Style*

Literature-recommended

1. Strunk, W., Jr. and White, E.B. *The Elements of Style*
2. Elsevier. (2021). [*https://www.sciencedirect.com/science*](https://www.sciencedirect.com/science).
3. Аудио видео материалын номзүйн бичилт.(2012). MNS 5638
4. Ном зүйн бичилт.(2012). MNS 5271
5. Шинжлэх ухааны баримт бичгийн эшлэл.(2005). MNS 5453