



الجامعة الوطنية - السودان
National University - Sudan

MSc in Research **Methodology** and Ethics



1. Introduction and Rationale

Introduction

This MSc. Research Methodology and Bioethics provides an in-depth exploration of research methodology, ethical considerations, and advanced data analysis techniques essential for high-quality academic inquiry. Students will gain expertise in both quantitative and qualitative research designs, biostatistics, and applications of artificial intelligence in research. A strong emphasis is placed on bioethics and human rights, ensuring scholars can navigate ethical complexities in emerging technologies and institutional review processes. Through rigorous coursework and practical fieldwork activities, students will develop critical appraisal skills, enhance their scientific writing abilities, and prepare a thesis that contributes to the field. This program equips graduates with the analytical and ethical knowledge necessary for impactful research across various disciplines.

In Sudan, there is an urgent need for skilled researchers to address the nation's pressing challenges. The country continues to experience significant disparities social outcomes, resource distribution, and policy implementation. Ongoing economic instability, development gaps, and recent crises, including the COVID-19 pandemic and the 2023 conflicts, have exposed critical weaknesses in health and social systems. These challenges underscore the importance of cultivating a research culture that prioritizes evidence-based solutions to inform decision-making, enhance public outcomes, and drive sustainable development. Developing local research capacity is essential to meet Sudan's unique needs and contribute to global scientific advancements.

The curriculum adopts a competency-based, student-centred approach, integrating adult learning theories and active participation through seminars, workshops, and project-based learning. The program focuses on building proficiency in research tools and techniques while promoting critical thinking and independent inquiry. By the end of the program, graduates will be equipped to contribute effectively to academic, professional, and community

research, thereby fostering innovation and addressing pressing needs in Sudan and beyond.

National University - Sudan is a private educational institution located in Khartoum, Sudan. Established in 2005, it originally began as the National College for Medical and Technical Studies before being upgraded to a university in 2014. The university offers a diverse eleven programs of undergraduate and postgraduate programs across fields such as medicine, Dentistry, pharmacy, Physiotherapy, Nursing, Radiography, engineering, business, International Relations, and information technology.

With a commitment to academic excellence, the university has gained recognition both nationally and internationally. It is accredited by the Ministry of Higher Education and Scientific Research in Sudan and is the only Sudanese private university accredited by the British Accreditation Council. The institution aims to provide high-quality education and foster innovation, preparing students to excel in their respective fields

Rationale

This Master program in Research and Bioethics is designed to equip scholars with essential research methodologies and ethical principles, ensuring integrity and accountability in academic inquiry. With a strong emphasis on bioethics, law, and human rights, students gain the ability to navigate ethical challenges in emerging technologies while developing expertise in quantitative and qualitative research designs, biostatistics, and artificial intelligence applications. The curriculum fosters critical thinking and analytical skills, preparing graduates to contribute meaningful research that upholds ethical standards.

Additionally, the program integrates practical fieldwork activities, ethical review processes, and scientific writing to enhance students' ability to conduct responsible research. Through thesis development, students refine their ability to critically appraise studies and apply ethical considerations to research. By bridging technical knowledge with ethical awareness, this program ensures that graduates become proficient researchers who can make informed ethical decisions that positively impact society.

Vision

To be a leading program in research methodology education, fostering a culture of evidence-based inquiry, ethical practices, and innovative research that addresses Sudan's national priorities and contributes to global scientific advancements

Mission

Provide high-quality education and practical training in research methodologies. Equipping students with the knowledge, skills, and ethical foundation required to conduct impactful research that informs policy, improves social outcomes, and addresses contemporary challenges in Sudan and beyond.

Goal

To produce competent, ethical, and innovative researchers capable of designing, conducting, and analyzing studies that contribute to evidence-based solutions for local, national, and global issues

Learning Outcomes

Upon successful completion of this program, graduates will be able to:

- Demonstrate a comprehensive understanding of research principles, designs, and methodologies applicable to diverse disciplines.
- Apply research methods: conduct systematic data collection and analysis using appropriate quantitative and qualitative research techniques.
- Utilize research software and tools to manage data and facilitate analysis.
- Maintain ethical principles in research, including informed consent, confidentiality, and the prevention of misconduct.
- Formulate and address research problems, identify gaps, design studies, and develop research questions, hypotheses, and objectives to address relevant issues.
- Communicate research findings clearly and effectively through written reports, visualizations, and oral presentations.
- Promote evidence-based inquiry, critical thinking, and innovation in academic and professional research settings.
- Enhance skills in leadership, collaboration, and project management to support career growth and professional advancement in research and related fields.
- Analyze and apply bioethical principles to research, ensuring responsible conduct, ethical decision-making, and adherence to international standards in human and healthcare-related studies

2. Program evaluation

The program evaluation includes (1) Trainers' feedback form, (2) Trainees' program evaluation form, (3) External examiners' report, (4) accrediting bodies and authorities.

3. Admission requirements:

Applicants must satisfy the general regulations set by the Ministry of Higher Education and Scientific Research and the Faculty of Graduate Studies and Scientific Research of the National University Sudan for registration for post graduate diploma degree.

Eligible candidates are holders Social and Applied sciences, Includes:

1. Bachelor of Medicine and Surgery.
2. Bachelor of Pharmacy.
3. Bachelor of Dentistry.
4. Bachelor of Public Health.
5. Bachelor of Veterinary Sciences.
6. Bachelor of Nursing Sciences and Midwifery.
7. Bachelor of Medical Laboratory Sciences.
8. Bachelor of Radiography and Medical Imaging.
9. Bachelor of Physiotherapy and Rehabilitation.
10. Bachelor of Nutritional Sciences.
11. Bachelor of International Health.
12. Bachelor of Health Care Management.
13. Bachelor of one of the Social Sciences (Art, Laws, Psychology, Sociology, Economics).
14. Bachelor of International Health and Diplomatic Studies.
15. Bachelor of Engineering
16. Bachelor of Statistics
17. Bachelor of Mathematics
18. Bachelor of Sciences

4. Study Programme

Total Credit Hours = 32

Contact Hours/week					
Course		Code	Credit Hours	Theory	Practical
Semester One					
1	Quantitative Research Design منهجية البحث الكمي	(QND-611)	3 (2+1)	2	2
2	Qualitative Research Design منهجية البحث النوعي	(QLD-612)	3 (2+1)	2	2
3	Statistics الإحصاء	(BIO-613)	3 (2+1)	2	2
4	Research Ethics أخلاقيات البحث العلمي	(ETH-614)	2 (1+1)	1	2
5	Applied Data Analysis and Software تحليل البيانات والبرمجيات	(ADS-615)	2 (0+2)	0	4
Total			13	7	12

Semester Two					
1	Artificial Intelligence and Research الذكاء الاصطناعي في البحث العلمي	(AIR-621)	2 (1+1)	1	2
2	Data Collection and Fieldwork Activities جمع البيانات وأنشطة العمل الميداني	(DCF-622)	2 (1+1)	1	2
3	Critical Appraisal and Secondary Research التقييم النقدي والبحث الثانوي	(CAS-623)	2 (1+1)	1	2

4	Bioethics, Health Law, and Human Rights الأخلاقيات، البيولوجية، قانون الصحة، وحقوق الإنسان	(BHR-624)	2 (2+0)	2	0
5	Research and Vulnerability البحث والفئات الضعيفة من المجتمع	(RVL-625)	2 (2+0)	2	0
6	Ethical Review Processes and Institutional Review Boards (IRBs) عمليات المراجعة الأخلاقية ولجان المراجعة المؤسسية	(IRB-626)	2 (2+0)	2	0

7	Ethical Challenges in Emerging Technology التحديات الأخلاقية في التكنولوجيا الناشئة	(ECT-627)	1 (1+0)	1	0
			13	10	6
Semester Three					
8	Scientific Writing الكتابة العلمية	(SCW-631)	2 (1+1)	1	2
9	Thesis And Manuscript الطروحة و الورقة العلمية	(THN-632)	6 (2+4)	2	8
Total			8	3	10

Semester One

Course Name: Quantitative Research Design

Course Code: (QND-611)

Credit Hours: 3 CHs

Introduction and Rationale

Quantitative research is a critical component of scientific inquiry, providing

the foundation for evidence-based decision-making in various fields. This course aims to equip students with the knowledge and skills necessary to design, conduct, analyze, and report quantitative research effectively. Through a systematic exploration of research methodologies, data collection techniques, and statistical tools, students will learn to address research questions with precision and rigor. EDRMas is will also be placed on ethical considerations to ensure integrity in research practices. This course is essential for developing a thorough understanding of quantitative research and its applications in real-world contexts.

Course Name: Qualitative Research Design

Course Code: (QLD-612)

Credit Hours: 3 CHs

Introduction and Rationale

Qualitative research serves as a foundational pillar of scientific inquiry, offering a unique lens through which complex human behaviours, experiences, and social phenomena can be explored. This course introduces students to the principles and practices of qualitative research, blending theoretical frameworks with practical application. By mastering the art of crafting research questions, conducting interviews and observations, analyzing qualitative data, and presenting findings, students will be equipped to make meaningful contributions to diverse fields such as social sciences, healthcare, education, and policymaking. This course is essential for fostering critical thinking, methodological rigor, and creativity in qualitative research.

Course Name: Statistics

Course Code: (BIO-613)

Credit Hours: 3 CHs

Introduction and Rationale

Statistics has become one of the most stimulating areas of research. This course introduces the student to the principles of statistics and concept of clinical trial design and analysis. Student will be able to explain the concept of variables, data description; probability and concepts of descriptive and inferential statistics. Student will be able to make decision about appropriate use of descriptive and inferential statistics according to the type of data and study design for answering a research question. This is foundation for the research methodology courses as well as the research project.

Course Name: Research Ethics

Course Code: (ETH-614)

Credit Hours: 2 CHs

Introduction and Rationale

Research ethics form the cornerstone of responsible scientific inquiry and practice. It provides the framework for conducting research that respects human rights, ensures the safety and well-being of participants, and upholds scientific integrity. This module introduces students to the principles, regulations, and applications of ethics in medical research. By understanding topics such as informed consent, confidentiality, risk assessment, and the role of ethics committees, students will gain the expertise to design and conduct ethically sound studies. This module is essential for cultivating ethical awareness and adherence in medical research across diverse contexts.

Course Name: Applied Data Analysis and Software

Course Code: (ADS-615)

Credit Hours: 3 CHs (longitudinal course-integrated with other courses)

Introduction and Rationale

Software tools for research and statistical analysis have become indispensable in modern research workflows. Alongside statistical analysis, the ability to calculate sample sizes accurately and perform efficient literature reviews is critical to conducting high-quality research. This course equips students with hands-on experience using tools for statistical analysis, sample size calculation, and literature management. With practical applications in real-world research scenarios, this course ensures students are prepared to manage datasets, design studies, review the literature, and present findings effectively, all while adhering to ethical guidelines.

Semester Two

Course Name: Artificial intelligence in research

Course Code: (AIR-621)

Credit Hours: 2 CHs

Introduction and Rationale

The integration of Artificial Intelligence (AI) into research has revolutionized traditional methodologies, providing researchers with innovative tools to enhance data analysis, pattern recognition, and decision-making processes. AI is revolutionizing various domains, from scientific discovery and social sciences to healthcare and business. In this context, the Artificial Intelligence in Research course, designed for postgraduate students in Research Methodology, aims to provide a comprehensive understanding of AI concepts and their application in research settings. This course will offer the potential to address these challenges by automating data analysis, providing advanced predictive models, and uncovering insights that may not be immediately apparent through conventional approaches.

Course Name: Data Collection and Fieldwork Activities

Course Code: (DCF-622)

Credit Hours: 3 CHs

Introduction and Rationale

The Data Collection and Fieldwork Activities course within the Postgraduate Research Methodology Diploma is designed to equip students with the necessary skills, knowledge, and techniques to effectively collect data and conduct fieldwork in diverse research contexts. Data collection is a foundational element in any research process, as it directly influences the quality, validity, and reliability of research outcomes. This course is integral to the postgraduate research methodology framework, offering students both theoretical insights and practical skills for designing, executing, and analyzing data collection processes in their respective research projects.

Course Name: Critical Appraisal and Secondary Research

Course Code: (CAS-623)

Credit Hours: 2 CHs

Introduction and Rationale:

The ability to critically appraise research is an essential skill for postgraduate students, researchers, and practitioners across various disciplines. As research methodologies evolve and the body of scientific literature expands, it becomes increasingly important for professionals to evaluate the quality, reliability, and relevance of research findings. The Critical Appraisal course, as part of the Postgraduate Research Methodology Diploma, aims to equip students with the necessary tools and frameworks to assess academic research systematically. By focusing on the critical analysis of primary research articles, stu-

dents will develop the ability to assess research quality, identify methodological flaws, and understand the implications of research findings for real-world applications.

The course will encompass different research designs, quantitative and qualitative methodologies, statistical analyses, and the ethical considerations involved in conducting and appraising research. Ultimately, students will gain the expertise to navigate the vast body of literature with confidence and make well-informed decisions based on sound evidence.

Course Name: Bioethics, Health Law, and Human Rights

Course Code: (BHR-624)

Credit Hours: 2 CHs

Introduction and Rationale

This course introduces postgraduate students to the foundational principles and frameworks that underpin ethical research involving human participants. It explores the intersection of bioethics, health law, and human rights, equipping students with the knowledge to analyze and resolve complex ethical dilemmas. Core ethical principles—autonomy, beneficence, non-maleficence, and justice—are studied alongside international legal instruments such as the Declaration of Helsinki, the Universal Declaration of Human Rights (UDHR), and the International Covenant on Civil and Political Rights (ICCPR). The course emphasizes how health law and rights-based approaches shape research governance, particularly in contexts marked by vulnerability, inequity, and power imbalances.

Course Name: Institutional Review Boards (IRBs) and Research Ethics Oversight

Course Code: (IRB-626)

Credit Hours: 2 CHs

Introduction and Rationale

This course provides a comprehensive examination of the structures and processes designed to ensure ethical conduct in research involving human participants. Emphasis is placed on the role, functions, and responsibilities of Institutional Review Boards (IRBs) and equivalent ethics committees globally. Students will gain practical skills in preparing and submitting IRB applications, drafting informed consent documents, and conducting risk–benefit analyses. The course examines regulatory frameworks such as the U.S. Common Rule, GDPR, and CIOMS guidelines, and compares how ethical review is conducted across different jurisdictions. Through case studies and mock reviews, students will learn how IRBs assess research protocols, provide feedback, and monitor ongoing studies.

Course Name: Ethical Challenges in Emerging Technology

Course Code: (ECT-627)

Credit Hours: 1 CHs

Introduction and Rationale

This course examines the ethical challenges posed by rapidly evolving technologies such as artificial intelligence, biotechnology, big data, and robotics. It highlights how these innovations reshape societies and research practices, often outpacing ethical frameworks and regulatory standards. Students will apply ethical theories (utilitarianism, deontology, virtue ethics) to real-world dilemmas involving digital privacy, human enhancement, algorithmic bias, and autonomous systems. The course also considers environmental and global justice perspectives, governance, and professional responsibility in technology-driven research. Case studies and debates encourage interdisciplinary engagement, drawing on philosophy, law, sociology, and computer science.

Semester Three

Course Name: Scientific Writing

Course Code: (SCW-631)

Credit Hours: 2 CHs

Introduction and Rationale

Scientific writing is an essential skill for postgraduate researchers as it facilitates effective communication of research findings within the scientific community. Writing for scientific purposes demands clarity, precision, and adherence to certain standards, which ensures that research contributions are well understood and easily reproducible by others. In the context of a Postgraduate Research Methodology Diploma, a course on scientific writing equips students with the necessary tools to write effectively, produce publishable work, and present their research in a structured and coherent manner.

This course aims to provide a comprehensive understanding of the principles of scientific writing, from understanding research objectives to drafting, revising, and publishing research papers. With an emphasis on best practices in writing, citation, and communication, this course will allow students to master the skills required for writing in a scientific and academic context.

Course Name: Thesis and Manuscript

Course Code: (THN-632)

Credit Hours: 6 CHs

Introduction and Rationale

The Thesis and Manuscript Course in a Research Methodology Postgraduate Diploma is designed to guide students through the essential stages of conducting high-quality research. The course provides a comprehensive understanding of research design, data collection, analysis, and presentation in a

structured format. It is an advanced-level course that emphasizes both theoretical and practical aspects of research, focusing on scholarly writing and the production of a thesis or manuscript that meets academic standards linked with the ability to conduct meaningful research and communicate findings effectively is critical for academic and professional success. The culmination of the course will be the submission of a well-researched thesis or manuscript that contributes to existing knowledge in the field of study.

5. Human Resources

- One Professor
- One Associate Professor
- Two Assistant Professors
- Two Lecturers
- one Technical Staff

6. Facilities

Lecture Rooms:

- One Lecture Room: 70 seats
- 3 Tutorial room: 20 seats each

Laboratories:

- Computer lab

Libraries:

- University Main Library
- E-library

7. Duration of the Programme

- Three Semesters = 52 weeks = 32 Credit Hours

8. Teaching Modules

- Lectures; seminars; tutorials
- Interactive learning: group discussion; self-directed learning; journal clubs; problem solving sessions-role play
- Practical works: field work
- Hands-on training in statistics software referencing surveys
- On-campus workshops

9. Language of Instruction

- English
- Other/ local language for communication with community leaders and community

10. Examinations Regulations

Abide by the examination's rules and procedures of the Graduate Studies of the National University-Sudan.

11. Assessment

- Continuous Assessment: 40%
- Final Examination: 60%

Written examinations

1. Type-A MCQs (best of four)
 - » Number: (60-100) MCQs
 - » Duration: one minute per MCQ.
2. Extended Matching Questions (R-Type EMQs)
 - » Number: 20-30
3. Duration: 1.5 for each question.
4. Case scenario

Practical examinations

1. Lab-based exams
2. Projects

Grading System

A+ (90-100) A (80-89) B+ (75-79) B (70-74) C+ (65-69) C (60-64) F (<60)

12. Award of the Degree

The Scientific Council of the National University-Sudan, based on the recommendation of the Board of the Faculty of Graduate Studies and Scientific Research, after fulfilling the requirements of the Faculty Board of the Faculty of Medicine and Surgery, shall award the successful candidate:

MSc in Research Methodology and Bioethics



NU.EDU.SD



Better Education
Better **World**

www.nu.edu.sd