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# STUDY GUIDE

## <<Medical Research >>

## <<1210691>>

# Medical research

**Course coordination**

Female section      << **Dr. Hanaa Bayoumy** <ebtehag.alenazi@nbu.edu.sa>)> >

Male section<<**Dr. Mohamed mousa**  Mohamed .abdalmawgod @nbu. edu. sa)

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## Course Identification

| | | |
|---|---|---|
| 1. | **Credit hours** | << 2 >> |
| 2. | **Level/year at which this course is offered** | << 6th year>> |
| 3. | **Pre-requisites for this course** | <<Pass 5th year>> |

## Course committee members

1. De: Basem Salama : Assistant Professor of Community Medicine
2. Dr. Muhammed Mossa: Assistant Professor of Community Medicine
3. Dr. Hanaa Bayoumy: Assistant Professor of Community Medicine

## Actual Learning Hours (Copy and paste the table from courses specification)

| No | Activity | | Learning Hours |
|---|---|---|---|
| **Contact Hours** | | | |
| 1 | Lecture | | 24 |
| 2 | **Laboratory/Studio (Role Play)** | | |
| 3 | **Tutorial** | | 6 |
| 4 | **Others** (Assignment, group discussion) | | |
| 5 | **Seminars** | | |
| | **Total** | | **30** |

\* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

**Course Objectives (Copy and paste the table from courses specification)**

### 1. Course Description

Course Description:

This course is a required component of the curriculum of bachelor of Medicine and Surgery (MBBS) at Northern Border University. In this course students will learn the basic principles of medical research methodologies, biostatistics, research ethics, data sources and data management to enable them to conduct a well-designed medical research that meets national and public needs. At the end of this course, students are expected to have a completed group project proposal and present it. They will be also encouraged to complete their project and publish their results or present their work in the national and international conferences

### 2. Course Main Objective:

**By the end of the course the student will be able to:**

1. To demonstrate unders tanding of medical research methodology, main data sources
2. To understand the key concepts in the responsible conduct of research and be able to apply the standards, rules, professional norms and ethical principles in the performance of all activities related to scientific research
3. To be able to independently formulate a research question, as well as be able to design and conduct a study to address that question.
4. To be able to conduct and present a successful well-.written research proposal
5. To enable students to have a research project that can be presented and published

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**Course Learning Outcomes (Copy and paste the table from courses specification)**

| | CLOs | Aligned-PLOs |
|---|---|---|
| 1 | **Knowledge:** | |
| 1.1 | Identify the principles of research methodology including appropriate statistical techniques, scientific writing and identify the relevant ethical issues | K5 |
| **2** | SKILLS : | |
| 2.1 | Think critically to solve the community health problems | S1 |
| 2.2 | Interpret selected tests of significance, summarize data and construct tables and figures, and demonstrate an efficient written communication ability | S2 |
| 2.3 | Operate the core writing skills properly | S6 |
| **3** | **Values:** | |
| 3.1 | Apply the skills of self-learning | V2 |

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## Course Content (Copy and paste the table from courses specification)

| No | List of lectures | Contact Hours |
|----|------------------|---------------|
| 1. | Introduction medical research & Evidence-based medicine<br><br>Ethics in health research | |
| 2. | How to conduct a well-written research proposal<br><br>Components of a successful research proposal | |
| 3. | Developing a good research question, Objective, and hypothesis of the study. | |
| 4. | How to write an introduction for research study?<br><br>The main components of a successful introduction.<br><br>How to do literature search?<br><br>The main research index and research engine<br><br>Referencing and in-text citation<br><br>What is plagiarism? How to avoid it? | |
| 5. | How to write materials & methods section of a research proposal?<br><br>Introduction to Study Designs: Descriptive study design | |
| 6. | Case control study design | |
| 7. | Cohort study design<br><br>Experimental study design | |
| 8. | Data collection methods and types of data sources for medical research<br><br>Tools for data collection: using questionnaire & other tools | |
| 9. | Sampling techniques & sample size estimation | |
| 10. | Basic concepts and terminology in biostatistics | |

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| | | |
|---|---|---|
| | Types of data<br><br>NDC | |
| 11. | Statistical significance of data I (P-value)<br><br>Statistical significance of data II (95% CI). | |
| 12. | - Statistical tests for quantitative variables: Statistical tests for qualitative variables: descriptive & inferential statistics -<br>- Construct table and figures | |
| | **Total** | **24** |

| No | List of Topics(Tutorial) | Contact Hours |
|---|---|---|
| 1- | How to do literature search? | 1 |
| 2- | How to write research proposal & research objective, research question, and research hypothesis? | 1 |
| 3- | How to write In text citation and reference list? | 1 |
| 4- | How to calculate prevalence and incidence rates, relative risk and odds ratio. | 1 |
| 5- | Designing questionnaire and study tools | 1 |
| 6- | - How to apply sampling techniques and sample size calculation<br>- Using appropriate statistical tests for quantitative and qualitative. | 1 |
| | **Total** | **6** |

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**Teaching strategies and Assessment Methods for Students (Copy and paste the table from courses specification)**

| Code | Course Learning Outcomes | Teaching Strategies | Assessment Methods |
|------|--------------------------|---------------------|--------------------|
| **1.0** | **Knowledge** | | |
| 1.1 | Identify the principles of research methodology including appropriate statistical techniques and identify the relevant ethical issues | Direct instruction (Lecture) Interactive instruction (Tutorial) | written exam |
| 1.2 | Identify the principles of research methodology including appropriate statistical techniques and identify the relevant ethical issues | Direct instruction (Lecture) Interactive instruction (Tutorial) | written exam |
| **2.0** | **Skills** | | |
| 2.1 | Think critically to solve the community health problems | Direct instruction (Lecture) Interactive instruction (Tutorial) Self-learning strategy (project) Interactive (Tutorial) | Written exam Final group project proposal |
| 2.2 | Interpret selected tests of significance, summarize data and construct tables and figures, and demonstrate an efficient written communication ability | Self-learning strategy (project) Interactive instruction (Seminar) | Project checklist Seminar checklist |
| 2.3 | Operate the core writing skills properly | Self-learning strategy | Project |

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| Code | Course Learning Outcomes | Teaching Strategies | Assessment Methods |
|------|--------------------------|---------------------|--------------------|
| | | (project) | checklist |
| 3 | VAUES | | |
| 3.1 | Apply the skills of self-learning | Self-learning strategy (project) | Written exam assignments |

## Assessment Tasks for Students (Copy and paste the table from courses specification)

| # | Assessment task* | Week Due | Percentage of Total Assessment Score |
|---|------------------|----------|--------------------------------------|
| 1 | Continuous assessment through assignments | During the semester | 10% |
| 3 | Quiz | 3th week | 20% |
| 4 | Final group project proposal | Last week | 20% |
| | Seminar checklist(Presentation) | 12th week | 10% |
| 5 | Final exam | Last week | 40% |
| | Total | | 100% |

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## Course blueprint (% of total summative- marks in blue print is to be given in the range)

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| Topics | Teaching strategies | Assessment methods | Knowledge | | | Skill | | | VALUES | | | % of total contact hours | % of total summative marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | K5 | | … | S1 | S2 | S6 | V2 | | … | | |
| Introduction medical research & Evidence-based medicine<br><br>Ethics in health research | Lecture Assignment | written exam | √ | | | | | | | | | 8.3 | 5 |
| How to conduct a well-written research proposal<br><br>Components of a successful research proposal | Lecture Assignment | written exam | √ | | | | √ | √ | | | | 8.3 | 5 |
| Developing a good research question, Objective, and hypothesis of the study. | Lecture Assignment | written exam | √ | | | √ | | | | | | 8.3 | 5 |
| How to write an introduction for research study?<br><br>The main components of a successful introduction.<br><br>How to do literature search?<br><br>The main research index and research engine | Lecture Assignment | written exam | √ | | | | | √ | √ | | | 8.3 | 5 |

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| Topics | Teaching strategies | Assessment methods | Knowledge | | | Skill | | | VALUES | | | % of total contact hours | % of total summative marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | K5 | | … | S1 | S2 | S6 | V2 | | … | | |
| Referencing and in-text citation <br><br> What is plagiarism? How to avoid it? | | | | | | | | | | | | | |
| How to write materials & methods section of a research proposal? <br><br> Introduction to Study Designs: Descriptive study design | Lecture Assignment | written exam | √ | | | | | √ | √ | | | 8.3 | 5 |
| Case control study design | Lecture Assignment | - written exam <br><br> - Continues assessment | √ | | | | | | | | | 8.3 | 5 |
| Cohort study design <br><br> Experimental study design | Lecture Assignment | - Written exam <br><br> - Continues assessment | √ | | | | | | | | | 8.3 | 5 |
| Data collection methods and types of data sources for medical research <br><br> Tools for data collection: using questionnaire & other tools | Lecture Assignment | - Written exam <br><br> - Continues assessment | √ | | | | | | | | | 8.3 | 5 |
| Sampling techniques & sample size | Lecture Assignment | - Written exam | √ | | | | | | | | | 8.3 | 5 |

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| Topics | Teaching strategies | Assessment methods | Knowledge | | | Skill | | | VALUES | | | % of total contact hours | % of total summative marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | K5 | | … | S1 | S2 | S6 | V2 | | … | | |
| estimation | | - Continues assessment | | | | | | | | | | | |
| Basic concepts and terminology in biostatistics  Types of data  NDC | Lecture Assignment | - Written exam<br>- Continues assessment | √ | | | | | √ | | | | 9 | 4-5 |
| Statistical significance of data I (P-value)  Statistical significance of data II (95% CI). | Lecture Assignment | written exam | √ | | | | √ | | | | | 9 | 4-5 |
| - Statistical tests for quantitative variables: Statistical tests for qualitative variables: descriptive & inferential statistics -<br>- Construct table and figures | | | | | | | √ | | | | | 9 | 5 |

## Learning Resources (Copy and paste the table from courses specification)

| | |
|---|---|
| **Required Textbooks** | 1. **Research Methods in Community Medicine: Surveys, Epidemiological Research, Programme Evaluation, Clinical Trials**<br>6$^{th}$ Edition, 2008<br>ISBN 13 : **9780470986615**<br><br>2. **Biostatistics: Basic Concepts and Methodology for the Health Sciences**<br>9$^{th}$ Edition, 2010<br>ISBN: *9780470413333*<br><br>3. Fundamentals        of        Biostatistics<br>7$^{TH}$        Edition,        2011<br>ISBN: *9780538735896* |
| **Electronic Materials** | https://sdl.edu.sa/SDLPortal/ar/Publishers.aspx |
| **Other Learning Materials** | Students Research Committee Workshops or other related worshops or lectures |

## Related check lists

Assignment √
Clinical skills checklist
Presentation checklist √
Project checklist √
Workshop checklist √

(Checklist must be aligned with the learning outcomes)

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## Presentation checklist

| S.No | Ability of the student to | Marks | Marks Obtained |
|---|---|---|---|
| 1 | Present her topic effectively | 3 | |
| 2 | Manage presentation time well | 3 | |
| 3 | Ask questions/answer questions reasonably well. | 2 | |
| 4 | Provide correct references | 2 | |
| | Total marks | 10 | |

## Project checklist: Rubric for Evaluation of Students' Research Proposal

| Criteria | 1 = Unacceptable; 2 = major revision; 3= minor revision; 4 = Acceptable | Score=20 |
|---|---|---|
| 1. General organization of the project and style:<br>● Complete with all required elements<br>● Formatting<br>● Grammar<br>● The references (in-text-citation and references list) are organized in certain style | 1= Unacceptable if : ● There are missing important elements of proposal ● The proposal is written in non-organized and distracted structure ● There are a lot of grammatical mistakes that influence the understanding of text ● The references are not in the required formatting 2 = Major revision There are huge mistakes that could be revised to accept the proposal. 3= Minor revision There are few mistakes that could be revised to accept the proposal. 4= Acceptable if: The proposal complete all required elements, it is organized and well written, there are no grammatical | 4 |

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| | | |
|---|---|---|
| | mistakes, and the references are provided in the required format. | |
| 2. Identification of the research question in term of aim and objectives | 1= Unacceptable if : Aim and objectives of the proposed work are absent or weak 2 = Major revision The aim and objective need major modifications. 3= Minor revision The aim and objective need some modifications. 4= Acceptable if: Aim and objectives of the proposed study are concisely and clearly stated and demonstrated. | 4 |
| 3. Introduction and literature review expression The previous research is evaluated and the literature gaps have been identified in coherent, relevant, and informative paragraphs. | 1= Unacceptable if : It fails to adequately relate the proposed research to the existing literature. 2 = Major revision It needs a major modification to be clearly understood. 3= Minor revision It is clear and informative, but it needs some modifications. 3= Acceptable if: It introduced the topics clearly, it demonstrated the knowledge of previous literature in the same topic, and it showed the gaps in the knowledge and related this gap to the proposed work. | 4 |
| 4. Research Design and Methodology parts ● Study design ● Study setting ● Targeted population (inclusion and exclusion criteria) | 1= Unacceptable if : ● There are missing important parts of the methodology ● The parts are not described sufficiently and clearly ● The chosen parts are not relevant to the proposed topic 2 = Major revision It needs a major modification, such as changing the study design. 3= Minor revision The chosen parts are | 4 |

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| | | |
|---|---|---|
| | appropriate and sufficient but need some modifications. 3= Acceptable if: All parts of the methodology are described and all chosen parts are appropriate and relevant to the chosen topic. | |
| 5. Sampling and research instrument<br>● Sampling technique<br>● Sample size calculation<br>● Research instrument<br>● Analysis plan | 1= Unacceptable if : ● Sampling technique is not appropriate ● Calculated sample size is not correct ● Source of data is not applicable ● Analysis tests are not relevant 2 = Major revision It needs a major modification to be clearly understood. 3= Minor revision: The chosen parts are appropriate and sufficient but need some modifications. 3= Acceptable if: Sampling technique is appropriate, calculated sample size is correct, source of data is applicable, and chosen analysis tests are relevant | 4 |
| Total score out of 20: | | |

Continuous assessment checklist

| ITEM | SCORE= 10 |
|---|---|
| Selection of research topic | 2 |
| Registration as a researcher in the National Committee of Bioethics (NBCE). | 3 |
| WRITING INTRODUCTION AND LITERATURE REVIES | 3 |
| METHODS SECTION | 2 |

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## Course quality evaluation

| Evaluation Areas/Issues | Evaluators | Evaluation Methods |
|---|---|---|
| Effectiveness of teaching and assessment | Students | Indirect assessment |
| Extent of achievement of course learning outcomes | Instructor <br> Students | Direct assessment <br> Indirect assessment |
| Quality of learning resources | Student | Indirect assessment |

After the end of the course, please give your **FEEDBACK** through the survey link: