

UNIVERSITY OF MOSTAR
SCHOOL OF MEDICINE
SCIENTIFIC METHODOLOGY

SCIENTIFIC METHODOLOGY

PROGRAM

FOR THE ACADEMIC YEAR 2021/2022

GENERAL NOTES ABOUT THE COURSE AND TEACHING:

The aim of the course is to enable the student to systematically assess science and scientific values, to introduce students to scientific research and critical reading and writing of scientific articles, and to use and evaluate information and knowledge in evidence-based medicine and healthcare. The basic aim of the course is to teach the students scientific research literacy through familiarization with the scientific way of thinking, types of scientific research, scientific work and retrieval of scientific information. These skills are essential for studying during the entire study of medicine and later on as medical doctors in everyday professional work and scientific research. Additional aim, beside acquiring knowledge, skills and attitudes about scientific work, is to prepare and train the students for lifelong learning.

Teaching objectives are centered around providing the students with knowledge and skills necessary for:

- preparing, organizing and presenting the results of the scientific work by applying the fundamental postulates of science and information technology;
- learning (especially continuous medical education, ie. lifelong learning) through use of the results of scientific research studies;
- organizing and presenting the results of professional and research work using information technology.

A further objective is to prepare the students, who will be future medical doctors, so that in senior years of their study they can recognize and use:

- evidence-based medical knowledge (information);
- the need for continuous advancement and usage of principles of scientific way of thinking throughout their study of preclinical and clinical medical courses;
- the role and tasks of medical doctors within a healthcare team, along with the application of basic scientific principles in development and improvement of the diagnostic procedures and treatment of patients.

Teaching consists of lectures, seminars and practical exercises with a focus on practical exercises and students' own scientific work (50% of teaching) where each student must work in a team (small group) on a specific research problem under the supervision of exercise and course leaders.

TEACHING UNITS:

1. Scientific way of thinking	
2. Scientific research	
3. Scientific information	
4. Scientific work	
5. Science in preclinical and clinical medicine	
6. Students' own scientific work	

LECTURES:

<i>Subject:</i>	Hours	
1. <i>Medicine is science - an introductory lecture</i>	2	
2. <i>Scientific research</i>	2	
3. <i>Scientific information</i>	2	
4. <i>Scientific work</i>	2	
5. <i>Medical data</i>	2	
6. <i>Science and preclinical/clinical medicine</i>	2	
7. <i>Medical information on the web</i>	2	
8. <i>Index publications and access to them</i>	2	
9. <i>Ethics in research</i>	2	
10. <i>Basics of statistical conclusion</i>	2	
11. <i>How to select an appropriate statistical test?</i>	2	
12. <i>Presenting the results of scientific work</i>	2	
Total: 12 x 2 = 24 hours		

SEMINARS:

<i>Subject:</i>	Hours	
1. <i>Types of scientific research, planning</i>	2	
Students should prepare the materials from the textbook 'Introduction to Scientific Research in Medicine', Chapters 4, 5, 7 and 8.		
2. <i>Planning scientific research and determining topics by individual groups of students</i>	2	
Students receive the topic/aim of the scientific research they will perform during the course.		
3. <i>Types of scientific research, measurement</i>	2	
Students should prepare the materials from the textbook 'Introduction to Scientific Research in Medicine', Chapters 4, 5, 7 and 8.		
4. <i>Use of bibliographic sources and strategies for their search</i>	2	
Students should prepare the materials from the textbook 'Introduction to Scientific Research in Medicine', Chapters 11-12.		
5. <i>Scientific article in medicine</i>	2	
Students should prepare the materials from the textbook 'Introduction to Scientific Research in Medicine', Chapters 14-17.		
6. <i>Data collection and measurement</i>	2	
7. <i>Data types (Analog, Digital)</i>	2	
8. <i>Preparation for data processing</i>	2	
9. <i>Preparation for writing own scientific article (instructions for authors, mentor agreement)</i>	2	
10. <i>Interpreting the research results</i>	2	
11. <i>Scientific article presentation and discussion</i>	2	
12. <i>Writing own scientific article</i>	2	
13. <i>Communication skills in scientific research</i>	2	
14. <i>Preparation of the final draft of students' own scientific work</i>	2	
Total: 14 x 2 = 28 hours		

PRACTICALS:

<i>Subject:</i>	Hours	
1. Data collection	3	
Students collect data for their own research in accordance with the planned activities.		
2. Data collection (2)	3	
Students collect data for their own research in accordance with the planned activities.	3	
3. Data types (analog, digital), creating the coding plan	3	
4. Data organization and formatting – sorting, formulas, functions, filters	3	
5. Confronting the data – Data entry	3	
Each student enters the collected data into MS Excel in accordance with the planned activities.		
6. Confronting the data – Data entry (2)	3	
Preparing the final MS Excel document that includes all of the collected data.		
7. Data validation – analyzing the correctness and validity of the entered data; organizing data		
8. Dealing with the data – Data processing	3	
Students process their own data – Descriptive statistics (MS Excel) and online Chi-squared test.		
9. Dealing with the data – Data processing (2)	3	
Students process their own data – Student’s T-test, ANOVA (MS Excel, Statistica / SPSS).		
10. Confronting the data – Data presentation	3	
Students are confronted with their own collected data and make appropriate tables and figures to present the data (MS Word, MS Excel).		
11. Writing the Materials and methods and Results sections of own scientific article	3	
12. Search for the relevant journal articles in accordance with the set problem and strategy	3	
13. Analysis of the structure and content of the selected scientific article	3	
14. Writing the Introduction and Discussion sections of own scientific article	3	
15. Writing References – introduction to reference organizing tools	3	
16. Final writing and submitting the scientific paper for review	3	
Total: 16 x 3 = 48 hours		

Note:

All classes are mandatory. In the current academic year all teaching will be performed in class and exceptionally online (Google Meet platform) in real time in accordance with the above program.