

## Faculty of Medicine of the University of Rijeka

**Course: Introduction to Scientific Research**

**Course coordinator: Vanja Pupovac, PhD, Assistant professor**

**Department: Department of Social Sciences and Medical Humanities**

**Study program: Integrated Undergraduate and Graduate University Study of Medicine in English**

**Year: 2<sup>nd</sup>**

**Academic year: 2021/2022**

## SYLLABUS

**Course information (brief course description, general guidelines, location and organisation of instruction, required equipment, instructions regarding class attendance and preparation, students' obligations, etc.):**

The course "Introduction to scientific research" is obligatory for the 2nd year of the Integrated Undergraduate and Graduate University Study of Medicine in English programme, encompassing 15 hours of lectures and 5 hours of seminars and enabling the acquisition of one (1) ECTS credit.

The course is expected to help students to gain insight into the laws of the scientific research process and to get acquainted with basics of science philosophy and theory, as well as to gain the skills of critical evaluation of scientific paper.

### **Assigned reading:**

1. Presentations (PPT);
2. Hulley SB Cummings SR, Browner W S Grady DG, Newman TB, ed., *Designing Clinical Research*. 4th ed., Philadelphia, USA: Lippincott Williams & Wilkins, A Wolters Kluwer Business; 2013.
3. Matko Marušić, ed., *Principles of Research in Medicine*, 2<sup>nd</sup> ed., Zagreb: Medicinska naklada, 2015.

### **Optional / additional reading:**

Evans I, Thornton H, Chalmers I and Glasziou P. *Testing Treatments*, 2nd Edition; London: Pinter and Martin. 2011. Available from: <http://www.testingtreatments.org/>

## Course teaching plan:

### List of lectures (with titles and description)

1. **Science in medicine and clinical research**  
Learning outcomes: to understand the basic science settings of medicine and to define possible sources of imperfection and biases in research.
2. **Anatomy and physiology of clinical research**  
Outcomes: understand basic terminology of clinical research
3. **Population and sample (definition, basic characteristics)**  
Outcomes: to understand basic characteristics of the sample, to understand importance of representativeness of a sample and random sampling method
4. **Population and sample (probabilistic and non-probabilistic sampling method; bias and random error)**  
Outcomes: to describe and understand different sampling methods, to recognise the most common biases in sampling method
5. **Planning research (problem, aim, hypothesis)**  
Outcomes: to describe and understand differences between problem, aim and hypothesis in scientific research.
6. **Planning research (variables)**  
Outcomes: to describe and understand phases of research plan
7. **Types of study design (observational, interventional)**  
Outcomes: to describe and understand aims of research and appropriate types of study design.
8. **Types of study design (primary and secondary, hierarchy of evidence)**  
Outcomes: to recognise aims and study design in an example of a research, to understand hierarchy of evidence
9. **Scientific medical publications: types, basic characteristics, structure of scientific paper**  
Outcomes: to differentiate medical information (primary, secondary, and tertiary publications)
10. **Scientific medical publications: bibliographic and citation databases; assessment of scientific paper/journal**  
Outcomes: to search bibliographic and citation databases
11. **Definitions (Schopenhauer, Shaw, Eccles, Marušić), the importance and the laws of the historical development of science (developmental phases, “migrating” of the scientific avantguard, specificities of medicine)**  
Outcomes: to understand the importance and laws of the historical development of science, to describe and interpret the phases of scientific development and the specificities of medicine. to explain the most important stands in science philosophy and to illustrate them by examples from science history.
12. **Bases of science philosophy (the structure of scientific revolutions according Kuhn; Wittgenstein, Popper, Feyerabend)**  
Outcomes: to name and explain basic notions of science philosophy, to analyse the historical development of empirical-inductive and deductive traits of science philosophy.
13. **The social structure of science**  
Outcome: to name and describe basic organisations in science
14. **Scientific thinking, differences between medicine and alternative medicine**  
Outcomes: to explain basics of scientific thinking
15. **Research ethics (research misconduct; frauds in science)**  
Outcomes: to understand the concept of research ethics and the importance of ethical principles in science. To recognize the forms of plagiarism and to discuss the ways of its prevention.

**List of seminars with descriptions:**

Seminars (1-5) imply designing a research plan according to a predetermined topic. The plan is made in groups of 3-5 students according to detailed instructions and it is additionally coordinated by the seminar leader.

**List of practical with descriptions:**

The course does not include practical.

**Students' obligations:**

Regular class attendance, five small quizzes (max 10%), two online exams (max 40%), the designing of a research plan (max 20 %), and the final written exam (max 30 %).

**Exam (exam taking, description of written/oral/practical part, point distribution, grading criteria)**

- the final exam is of written form; the exam lasts for 30 minutes and entails a multiple-choice and short answers types of questions in accordance with the reference list available on the website;
- in accordance with the general rules of the Faculty of Medicine, a minimum of 50 % of correct answers is required to pass the exam;
- in order to be admitted to the final exam, the student has to gather at least 35 (50 %) of the total of 70 points before the final exam.

**Possibility of teaching in another language:**

The course is offered in Croatian and English.

**Other important information regarding the course:**

**Missing up to 30 %** of the classes (with a presumed justified reason), does not require justification and cannot be made up for (the exception being provided by a hospital discharge letter). Missing more than 30 % of classes, no matter the reason, will prevent the student from taking the final exam and result in a repeated enrolment in the course the following academic year.

It is not possible to **"decline"** a positive mark, but students can appeal to the Dean in written form within 24 hours.

Collaborator: Amir Muzur MD, MA, PhD, Full Professor

## COURSE SCHEDULE (for academic year 2020/2021)

Date	Lectures (time and place)	Seminars (time and place)	Practicals (time and place)	Instructor
18/04/2022	10:00-12:00 (on-site)			Vanja Pupovac, PhD, Assistant professor
25/04/2022	11:00-13:00 (on-line)			Vanja Pupovac, PhD, Assistant professor
02/05/2022	11:00-13:00 (on-site)			Vanja Pupovac, PhD, Assistant professor
9/05/2022	11:00-13:00 (on-line)			Vanja Pupovac, PhD, Assistant professor
16/05/2022	11:00-13:00 (on-site)			Vanja Pupovac, PhD, Assistant professor
23/05/2022	11:00-13:00 (on-site)			Amir Muzur, MD, MA, PhD, Full Professor
30/05/2022	11:00-13:00 (on-site)			Amir Muzur, MD, MA, PhD, Full Professor
27/05/2022		11:00-15:00 (group 1) (on-line)		Helena Štrucelj , mag. psych
3/06/2022		11:00-15:00 (group 2) (on-line)		Helena Štrucelj, mag. psych
06/06/2022	11:00-13:00 (on-site)			Amir Muzur, MD, MA, PhD, Full Professor

**List of lectures, seminars and practicals:**

	<b>LECTURES (topic of lecture)</b>	<b>Teaching hours</b>	<b>Place</b>
P1	Science in medicine and Clinical research	1	
P2	Anatomy and Physiology of clinical research	1	
P3	Population and sample (definition, basic characteristics)	1	
P4	Population and sample (probabilistic and non-probabilistic sampling method; bias and random error)	1	
P5	Planning research (problem, aim, hypothesis)	1	
P6	Planning research (variables)	1	
P7	Types of study design (observational, interventional)	1	
P8	Types of study design (primary and secondary, hierarchy of evidence)	1	
P9	Scientific medical publications: types, basic characteristics, structure of scientific paper	1	
P10	Scientific medical publications: bibliographic and citation databases; assessment of scientific paper/journal	1	
P11	Definitions (Schopenhauer, Shaw, Eccles, Marušić), the importance and the laws of the historical development of science (developmental phases, "migrating" of the scientific avant-garde, specificities of medicine)	1	
P12	Bases of science philosophy (the structure of scientific revolutions according Kuhn; Wittgenstein, Popper, Feyerabend)	1	
P13	The social structure of science	1	
P14	Scientific thinking, differences between medicine and alternative medicine	1	
P15	Research ethics		
	<b>Total number of lecture hours</b>	<b>15</b>	

	<b>SEMINARS (topic of seminar)</b>	<b>Teaching hours</b>	<b>Place</b>
S1-5	Designing a research plan	5	on-line
	<b>Total number of seminar hours</b>	<b>5</b>	

	<b>PRACTICALS (topic of practical)</b>	<b>Teaching hours</b>	<b>Place</b>
V1	/	/	
	<b>Total number of practicals hours</b>		

	<b>EXAM DATES (final exam)</b>
1.	23/06/2022
2.	08/07/2022
3.	15/09/2022