[Medicinski fakultet u Rijeci]

**Curriculum**
**2023/2024**

[Za kolegij]

# Introduction to Scientific Research

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| Study program: | **Medical Studies in English (R)**<br>[Sveučilišni integrirani prijediplomski i diplomski studij] |
| Department: | **[Katedra za društvene i humanističke znanosti u medicini]** |
| Course coordinator: | **izv. prof. dr. sc. Pupovac Vanja, prof.** |
| Year of study: | **2** |
| ECTS: | **1** |
| Incentive ECTS: | **0 (0.00%)** |
| Foreign language: | **Possibility of teaching in a foreign language** |

## Course information:

The course “Introduction to Scientific Research” is mandatory for the 2nd year of the Integrated Undergraduate and Graduate University Study of Medicine in English program, encompassing 6 hours of lectures and 14 hours of seminars and enabling the acquisition of one (1) ECTS credit.

After taking the course, students will be able to critically interpret medical research and independently assess the credibility of scientific information.

## List of 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, 2nd ed., Zagreb: Medicinska naklada, 2015.

## List of optional 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/

## Curriculum:

**[Predavanja] list (with titles and explanation):**

**1. Science in medicine and clinical research**

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**

understand basic terminology of clinical research

**3. Population and sample (definition, basic characteristics)**

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)**

to describe and understand different sampling methods, to recognise the most common biases in sampling method

**5. Planning research (problem, aim, hypothesis)**

to describe and understand differences between problem, aim and hypothesis in scientific research

**6. Planning research (variables)**

to describe and understand different types of variables

**7. Types of study design (observational, interventional)**

to describe and understand aims of research and appropriate types of study design.

**8. Types of study design (primary and secondary, hierarchy of evidence)**

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**

to differentiate medical information (primary, secondary, and tertiary publications

**10. Scientific medical publications: bibliographic and citation databases; assessment of scientific paper/journal**

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)**

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)**

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**

to name and describe basic organisations in science

**14. Scientific thinking, differences between medicine and alternative medicine**

to explain basics of scientific thinking

**15. Research ethics (research misconduct; frauds in science)**

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.

**[Seminari] list (with titles and explanation):**

**Seminar**

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.

## Student obligations:

Regular class attendance (excused absence of 30% from each form of class is allowed (1 out of 6 lectures; 4 out of 14 seminars).

The student will complete the course if he collects 50% of the points that he can collect in the following way:

Four online quizzes (4x7% = 28%),

Critical analysis of scientific paper 1 (max 28%),

Critical analysis of scientific paper 2 (max 22%),

Design of a research plan (max 20%).

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

## Other notes (related to the course) important for students:

Absence from classes up to 30% (1 lecture and 4 seminars) assumes a justified reason and cannot be compensated (the exception is a discharge letter from hospital treatment). An absence of more than 30%, regardless of the reasons, entails re-enrollment during the following academic year.

It is impossible to "reject" a positive grade obtained on the final exam, but only act per Article 46 of the Regulations on Studies of the University of Rijeka (a student dissatisfied with the grade submits a written appeal to the dean within 24 hours).

## COURSE HOURS 2023/2024

Introduction to Scientific Research

| **[Predavanja]**<br>(Place and time or group) | **[Seminari]**<br>(Place and time or group) |
|---|---|
| **22.04.2024** | |
| 1. Science in medicine and clinical research:<br>• [Z6] (12:00 - 14:00) [420]<br>  ○ ITSR<br><br>2. Anatomy and physiology of clinical research:<br>• [Z6] (12:00 - 14:00) [420]<br>  ○ ITSR | |
| izv. prof. dr. sc. Pupovac Vanja, prof. [420] | |
| **29.04.2024** | |
| 3. Population and sample (definition, basic characteristics):<br>• [P08] (11:00 - 13:00) [420]<br>  ○ ITSR<br><br>4. Population and sample (probabilistic and non-probabilistic sampling method; bias and random error):<br>• [P08] (11:00 - 13:00) [420]<br>  ○ ITSR | |
| izv. prof. dr. sc. Pupovac Vanja, prof. [420] | |
| **06.05.2024** | |
| 5. Planning research (problem, aim, hypothesis):<br>• [ONLINE] (11:00 - 13:00) [420]<br>  ○ ITSR<br><br>6. Planning research (variables):<br>• [ONLINE] (11:00 - 13:00) [420]<br>  ○ ITSR | |
| izv. prof. dr. sc. Pupovac Vanja, prof. [420] | |
| **13.05.2024** | |
| 7. Types of study design (observational, interventional):<br>• [ONLINE] (11:00 - 13:00) [420]<br>  ○ ITSR<br><br>8. Types of study design (primary and secondary, hierarchy of evidence):<br>• [ONLINE] (11:00 - 13:00) [420]<br>  ○ ITSR | |
| izv. prof. dr. sc. Pupovac Vanja, prof. [420] | |
| **20.05.2024** | |
| 9. Scientific medical publications: types, basic characteristics, structure of scientific paper:<br>• [P08] (11:00 - 13:00) [142]<br>  ○ ITSR<br><br>10. Scientific medical publications: bibliographic and citation databases; assessment of scientific paper/journal:<br>• [P08] (11:00 - 13:00) [142]<br>  ○ ITSR | |
| prof. dr. sc. Muzur Amir, dr. med. [142] | |

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| **27.05.2024** | |
| 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):<br>• [P08] (11:00 - 13:00) [142]<br>  ◦ ITSR<br><br>12. Bases of science philosophy (the structure of scientific revolutions according Kuhn; Wittgenstein, Popper, Feyerabend):<br>• [P08] (11:00 - 13:00) [142]<br>  ◦ ITSR | |
| prof. dr. sc. Muzur Amir, dr. med. [142] | |
| **03.06.2024** | |
| 13. The social structure of science:<br>• [P08] (11:00 - 13:00) [142]<br>  ◦ ITSR<br><br>14. Scientific thinking, differences between medicine and alternative medicine:<br>• [P08] (11:00 - 13:00) [142]<br>  ◦ ITSR | Seminar:<br>• [Z7] (15:00 - 18:00) [421]<br>  ◦ ITSR<br>  ◦ Intro S2 |
| prof. dr. sc. Muzur Amir, dr. med. [142] · Štrucelj Helena, dipl. psih-prof. [421] | |
| **07.06.2024** | |
| | Seminar:<br>• [P08] (11:00 - 14:45) [421]<br>  ◦ ITSR<br>  ◦ Intro S1 |
| Štrucelj Helena, dipl. psih-prof. [421] | |
| **10.06.2024** | |
| 15. Research ethics (research misconduct; frauds in science):<br>• [P08] (11:00 - 12:00) [420]<br>  ◦ ITSR | |
| izv. prof. dr. sc. Pupovac Vanja, prof. [420] | |

## List of lectures, seminars and practicals:

| [PREDAVANJA] (TOPIC) | Number of hours | Location |
|---|---|---|
| 1. Science in medicine and clinical research | 1 | [Z6] |
| 2. Anatomy and physiology of clinical research | 1 | [Z6] |
| 3. Population and sample (definition, basic characteristics) | 1 | [P08] |
| 4. Population and sample (probabilistic and non-probabilistic sampling method; bias and random error) | 1 | [P08] |
| 5. Planning research (problem, aim, hypothesis) | 1 | [ONLINE] |
| 6. Planning research (variables) | 1 | [ONLINE] |
| 7. Types of study design (observational, interventional) | 1 | [ONLINE] |
| 8. Types of study design (primary and secondary, hierarchy of evidence) | 1 | [ONLINE] |
| 9. Scientific medical publications: types, basic characteristics, structure of scientific paper | 1 | [P08] |

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|---|---|---|
| 10. Scientific medical publications: bibliographic and citation databases; assessment of scientific paper/journal | 1 | [P08] |
| 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) | 1 | [P08] |
| 12. Bases of science philosophy (the structure of scientific revolutions according Kuhn; Wittgenstein, Popper, Feyerabend) | 1 | [P08] |
| 13. The social structure of science | 1 | [P08] |
| 14. Scientific thinking, differences between medicine and alternative medicine | 1 | [P08] |
| 15. Research ethics (research misconduct; frauds in science) | 1 | [P08] |

| [SEMINARI] (TOPIC) | Number of hours | Location |
|---|---|---|
| Seminar | 5 | [P08]<br>[Z7] |

**EXAM DATES (final exam):**

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| 1. | 12.06.2024. |
| 2. | 09.07.2024. |
| 3. | 16.09.2024. |