SYLLABUS

1. Course title:

ISOLATION OF NATURAL MEDICINAL SUBSTANCES

2. Code:

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

Student does not have to pass any subject before this.

7. Class restrictions:

No restrictions

8. Duration / semester:

1 4

9. Weekly contact hours:

9.1. Lectures:	2
9.2. Seminars:	0
9.3. Laboratory/Practice classes:	0

10. Faculty:

Faculty of Farmacy

11. Department/study program:

Farmacy (integrated I and II cycle)

12. Lecturer:

dr. sc. Ermina Cilović Kozarević

13. Lecturer's e-mail:

ermina.cilovic@untz.ba

14. Web site:

www.frmf.untz.ba

15. Course aims:

- Get acquainted with modern methods of isolation of medicinal substances in laboratory conditions.
- Acquire basic knowledge and skills of isolation of bioactive substances from natural sources.
- To provide an understanding of the role of bioactive natural substances in the discovery, development and production of medicines.
- Get acquainted with modern medicines of natural origin originating from microorganisms, medicinal plants, animals and marine organisms.

16. Learning outcomes:

At the end of the semester / course, successful students, who continuously performed theirs during the entire teaching period obligations, will be able to:
-define the basic principles of isolation of bioactive natural substances,
-define methods of identification of natural compounds,
-adopte basic methods of extraction, separation and purification of bioactive natural substances from complex natural mixtures in laboratory conditions,
-application of a simple method of confirming the identity of isolated natural substances.

17. Course content:

The role and importance of bioactive natural substances in drug discovery.
Modern medicines of natural origin.
Distillation processes in the isolation of volatile substances.
Isolation of essential oils.
Extraction with volatile and non-volatile solvents.
Supercritical fluid extraction.
Ultrasonic extraction.
Microwave extraction.
Methods of separation of natural medicinal substances.
Application of chromatographic methods in the isolation of bioactive natural substances.
Chemical characterization of bioactive natural substances.
Basic principles and procedures for isolation of cardiotonic glycosides, flavonoids, saponins, alkaloids.
Isolation of bioactive natural substances from marine organisms.
Modern testing of bioactive natural substances.
Seminars.

18. Learning methods:

Teaching methods: lectures (theoretical teaching) and seminars. The lectures include the entire material provided by the curriculum and are conducted ex cathedra. Work material from lectures is available to students.
The student's seminar work is a mandatory group team project.

19. Assessment methods:

Knowledge testing methods: final exam, seminar paper. The final exam is written and/or oral in the scheduled exam times and contains essay questions, questions with short answers, and questions with multiple choice answers. Topics for seminar papers are assigned by the teacher at the beginning of the semester. Seminar papers are done in groups and defended publicly during lectures.
The exam grade is determined according to the following scale:
Student obligations Points

Seminar paper	50 (minimum 28 points)
Final test	50 (minimum 27 points)

20. Assessment components:

The final success of the student is evaluated using the grading scale as follows:
10 (A) - outstanding performance without errors or with minor errors, 95-100 points
9 (B) - above the average, with some errors, 85-94 points
8 (C) - average, with noticeable errors, 75-84 points
7 (D) - generally good, but with significant shortcomings, 65-74 points
6 (E) - meets the minimum criteria, 55-64 points
5 (F, FX) - does not meet the minimum criteria, below 55 points
The grade 6 (E) is the lowest passing grade.

21. Required reading list:

1. Authorized lectures by teachers.
2. Šarić-Kundalić B, Ademović Z, Mazić M (2019). Introduction to Pharmacognosy 2, Tuzla (pages 34-103)
3. Bioactive natural products, detection, isolation, and structural determination (2008), Taylor & Francis Group.

22. Web sources:

1.Canell RJP. How to approach the isolation of a natural product.
https://catbull.com/alamut/Bibliothek/How_to_Approach_the_Isolation_of_a_Product.pdf

23. Applicable starting from the academic year:

2018/19

24. Adopted in the Faculty/Academy session:

17.11.2025.