SYLLABUS

1. Course title:

MECHANICS

2. Code:

LRUDMEH

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

Mandatory

6. Prerequisites:

Mathematics, Physics

7. Class restrictions:

No

8. Duration / semester(s):

1 3

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)	
9.1. Lectures	4		Classes:	67,50	
9.2. Seminars	1		Individual work:	92,33	
9.3. Laboratory / Practice classes	1		In total:	159,83	

10. Faculty:

Mining, Geology and Civil Engineering

11. Department/study program:

Mining Engineering

12. Lecturer:

PhD Sabid Zekan Full Professor

13. Course aims:

Master the general principles of mechanics, which include: statics, kinematics, and dynamics. Enable students to follow lessons in other engineering subjects. Equip them with the knowledge to apply it to a wide range of engineering disciplines when sizing mining and geotechnical structures, designing, maintaining, and analyzing transport systems, and designing,

maintaining, and analyzing mining machines and equipment. Ensure sufficient worker safety through the application of mechanics as an engineering discipline. Ensure economic efficiency and profitability in operations through the application of mechanics as an engineering discipline.

14. Learning outcomes:

The course is passed with a grade from 6 to 10, which means that the student has fulfilled the course objectives. At the end of the semester/course, successful students, who have continuously completed their obligations throughout the entire teaching period, will be capable of:

- **Independently solving technical problems related to the knowledge acquired in Mechanics.**
- **Using literature to solve problems in this field.**
- **Understanding the significance of this course in solving practical problems.**
- **Applying acquired knowledge in the scientific research process during and after their studies.**
- **Participating in the scientific research process at their home department.**
- **Using the knowledge and skills for subsequent courses during their studies.**

15. Course content:

Introduction to Statics. Axioms of Statics. System of Concurrent Forces

- **Moment of Force. Varignon's Theorem**
- **Arbitrary Plane of a Force System**
- **Center of Gravity**
- **Friction**
- **Introduction to Structures. Internal Forces**
- **Simple Beam, Loaded with Concentrated Forces, Loaded with Distributed Load**
- **Beam Loaded with Eccentric Load, Beam with Supports**
- **Cantilever. Gerber Beam**
- **Three-Joint Arch**
- **Truss Frame**
- **Spatial Force System**
- **Rectilinear Motion of a Point**
- **Curvilinear Motion of a Point**
- **Translational and Rotational Motion of a Rigid Body**
- **Straight-Line Motion of a Rigid Body**
- **Introduction to Dynamics. Rectilinear Motion of a Material Point**
- **Curvilinear Motion of a Point. Parabolic Trajectory**
- **Momentum and Kinetic Energy for a Material Point. Work and Power. Impulse of a Force**
- **D'Alembert's Principle for a Point**
- **Dynamics of a System. Moment of Inertia of a Rigid Body**
- **Law of Motion of the Center of Mass of a System**
- **Momentum and Moment of Momentum of a System**
- **Dynamics of Rotational and Translational Motion of a Rigid Body**

16. Learning methods:

• Lectures
• Exercises
• Tests
• Programming tasks
The student is required to attend lectures and exercises regularly throughout the semester. The student is also required to complete programming tasks.
During the semester, the student can earn up to 10 points based on the programming tasks completed.
In the teaching process, the student must actively participate, which involves discussing any uncertainties regarding the material being studied with the instructor. Tests are provided for additional training outside of class to further practice and consolidate knowledge.

17. Assessment methods:

Knowledge assessment is divided into three parts:

- **Programming tasks**
- **First part – Statics (S)**
- **Second part – Kinematics and Dynamics (K+D)**

The programming tasks must be completed during the teaching period and are a requirement for the student to fulfill their academic obligations.
The knowledge assessment is conducted in two phases. The first phase is primarily written, where the student can choose to take the (S) and (K+D) parts separately or together. The second phase of the exam is an oral examination.
4o mini

18. Assessment components:

Grading System and Evaluation

- **First part – Statics (S): 25 points**
- **Second part – Kinematics and Dynamics (K+D): 25 points**
- **Pre-exam activities: 50 points**
- **Final exam: 50 points**
- **Total points: 100**

The final success of the student after all forms of knowledge assessment is evaluated and graded according to a system comparable with the ECTS grading scale as follows:

- **10 (A): Excellent performance with no or only minor errors (95-100 points)**
- **9 (B): Above average performance with some errors (85-94 points)**
- **8 (C): Average performance with noticeable errors (75-84 points)**
- **7 (D): Generally good, but with significant deficiencies (65-74 points)**
- **6 (E): Meets the minimum criteria (54-64 points)**
- **5 (F, FX): Does not meet the minimum criteria (less than 54 points)**

19. Mandatory reading list:

1. S.M.Targ, Kratak kurs teorijske mehanike, Građevinska knjiga, Beograd, 1990
2. S. Zekan, N. Ribić: Zbirka zadataka iz mehanike - statika, Tuzla, 2020
3. D. Rašković, Zbirka zadataka iz mehanike, Univerzitet u Beogradu, 1996

20. Additional reading list:

1. L. Rusov, Mehanika, Naučna knjiga, Beograd, 1988
2. D. Rašković, Mehanika, Statika, Građevinska knjiga Beograd

21. Web sources:

22. Applicable from the academic year:

2025/26

23. Adopted in the Faculty/Academy session: