



## INTERDISCIPLINARY CONNECTIONS OF THE COURSE “THEORETICAL MECHANICS” IN TECHNICAL EDUCATION

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### Abstract

This article examines the interdisciplinary interaction of the course “Theoretical Mechanics” with other academic disciplines in technical education. The study analyzes how the integration of theoretical mechanics with subjects such as physics, chemistry, thermodynamics, materials science, and engineering disciplines improves the quality of education for students in technical fields. The interdisciplinary approach allows students to acquire deeper theoretical knowledge, develop engineering thinking, and effectively solve technical problems related to materials, machine design, and technological processes.

**Keywords:** theoretical mechanics, interdisciplinary relations, engineering education, technical disciplines, design, materials science, technological processes.

### Introduction

In modern education systems, the development of science and technology requires the integration of academic disciplines. In technical education, this integration plays a key role in ensuring the effective training of highly qualified specialists. One of the important disciplines that connects many engineering subjects is “Theoretical Mechanics”.

Theoretical mechanics forms the fundamental basis for understanding the behavior of mechanical systems, structures, and engineering mechanisms. Its concepts are closely related to many other scientific and technical disciplines including physics, chemistry, thermodynamics, heat engineering, materials science, and machine design.

### Literature Review

In scientific literature, the concept of interdisciplinary connections is widely discussed. Researchers describe interdisciplinary relations as connections between scientific concepts, laws, theories, and educational content of different disciplines.

Afanasyeva defines interdisciplinary relations as one of the important characteristics of modern scientific knowledge. Cherkes-Zade considers interdisciplinary integration as a didactic condition that helps organize the educational process more efficiently. Other researchers emphasize that interdisciplinary connections improve students’ ability to understand complex scientific and engineering problems.

### Methodological Approach

In technical education programs, the course “Theoretical Mechanics” is typically taught in the third semester and serves as a foundation for several engineering subjects such as strength of materials, theory of machines and mechanisms, and machine design.

For example, when evaluating the strength of engineering structures, equilibrium equations from statics are used to determine forces acting on supports. Based on these calculated forces, appropriate construction materials for structural elements are selected.

Knowledge gained from machining processes such as drilling, turning, and milling is also applied in practical subjects like professional skills and equipment maintenance. Such integration helps students understand how theoretical knowledge is applied in real industrial processes.

### **Discussion**

The interdisciplinary approach significantly improves the efficiency of the educational process. By linking theoretical mechanics with other engineering disciplines, students develop the ability to analyze technical systems from multiple scientific perspectives.

Moreover, interdisciplinary education helps students save time in learning complex concepts because knowledge obtained in one subject can be directly applied in another. This creates a unified system of technical knowledge and improves students professional competencies.

### **Conclusion**

The study demonstrates that interdisciplinary connections play an important role in the effective teaching of theoretical mechanics in technical education. The integration of this discipline with other engineering and scientific subjects helps students acquire comprehensive knowledge, develop analytical thinking, and solve engineering problems more effectively.

Therefore, strengthening interdisciplinary integration in technical education should be considered an essential component of modern engineering training.

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