

Summary

“ Analytical Mechanics”

for students of all forms of education

Credit module « Analytical Mechanics» is part of a cycle professional and practical preparation in the direction of preparation Mechanical Engineering speciality Equipment of Pharmaceutical and Biotechnological Productions for students 4 course (7 semester).

The discipline of the department realized Department of Bioengineering and Biotechnies Faculty of Biotechnology and Biotechnies NTYY «KPI».

Credit module " Analytical Mechanics" examines the gives the student the ability to:

- determine the degree of freedom systems,
- election of the generalized coordinates, velocities, the generalized forces.
- build abstract design scheme from the existing operating equipment and for the further transition from abstract models to nature, while formulating its projected kinematic characteristics;
- properly carry out the operation decomposition of the element base of equipment to simple, classic models;
- determine the vector of momentum and angular momentum in the mobile (non-inertial) coordinate system and absolute;
- correctly classify the forces acting on the internal and external;
- justify the existence of conservation laws and their appropriateness for further analysis of the kinematics of the equipment;
- explain on a model of human research and their application in the synthesis of further invariatsiynih systems to external influences.
- use of standard methods of calculation for the design of parts and components of engineering products;
- use professionally profiled knowledge and skills in the field of theoretical mechanics to solve professional problems
- ability to understand the functional orientation of flexible production lines, robotic systems and manipulators individual drives, the ability to identify means of increasing the efficiency of the equipment.

Get **knowledge:**

- analysis of the understanding of the nature of occurrence of the kinematic and force (vibration) methods of mechanics to produce nonlinear differential equations of mechanical systems with one, two or more degrees of freedom.
- principles of building design schemes elements equipment industry;
- decomposition methods of complex mechanical systems in the model fragments;
- classify the forces acting on the internal and external;
- transition from the vector form of the theory to the dynamics of the corresponding scalar;
- analysis of the computational model was built for the presence and

expression of the conservation laws;

- clear division of the absolute motion of a mechanical system on a portable and relative components;

- determine the characteristics of the kinematics of mechanical systems and analysis of the ways of its correction.

- Possession of the general principles of mechanics and non-inertial inertial coordinate

- methods of integrating the equations of dynamics

- understanding of the mechanism of accounting and D'alambertovih Euler inertial forces in the construction of an analytical software design diagrams of equipment in general and its components;

the ability to:

- use the methods of mechanics of the procedure for the real mechanisms of decomposition with subsequent qualitative and quantitative analysis of the dynamics of the equipment and the conditions of occurrence of local peculiarities of the resonance structure under the influence of kinematic and power of external perturbations;

- using legal and technical documentation and components process equipment and equipment of pharmaceutical and microbiological industry, with equipment workstation build unified technological production line of pharmaceutical products;

- using legal and technical documentation, using equipment workstation plan and organize the operation, to provide support, maintenance and repair of the process equipment and the equipment of pharmaceutical and microbiological industry.

Developer summary *Karachun Vladimir Vladimirovich, Professor*