

Report of the department “Theory of elasticity and plasticity” of IMM ANAS for 2018.

On Scientific activity

The staff of the department consists of 1 cand. prof, math, sci, prof; 2 ass. prof ; 3 cand of sci; 2 scnior laboratory assistant, translater, engineer.

In the department 6 scientific works are conducted on “ Bendine, stability and and vibrations of inhomogeneous and anisotropic structural elements”. On the report period 8 papers and 2 abstracts were published. Who of the 2 papers were published in Thomas Reuters journal. 1 papers were admitted for publication. 2 papers were prepared for publication.

Work A. Free vibrations of anisotropic inhomogeneous rectangular plates (V.J.Gadjiev).

Numerical calculations are carried out in specific values of characteristic parameter and influence of anisotropy and especially of characteristics on the frequency value is analyzed. In this paper, the problem of free oscillations of an anisotropic rectangular plate located on the basis of Pasternak type is investigated.

$$q = k_v w - k_p \left(\frac{\partial^2 w}{\partial x^2} + \frac{\partial^2 w}{\partial y^2} \right)$$

It is assumed heat the constants a_{ij} -characterizing the anisotropy continuously change along the thickness and is a continuous function of the coordinate along the density thickness.

Work B. Determination and boundary conditions of force components in concave shells. (Kh.I.Musayev).

The rotating hyperboloid loaded by normal load was calculated as follows. According to the character and form of the shell under the normal load it is widely used in engineering constructions.

Work C. Determination of frequency in natural vibration of anisotropic plate with periodic curve structure (T.Y.Zeynalova).

In the work done, referring to the continual theory, the problem of determining the frequency in a particular vibration for a rectangular plate made of a multilayer composite material with a periodically curved structure is considered.

In transformed elasticity coefficient material, the dependence between stress and strain is subjected to the Hooker law.

Work D. Symmetric vibration of an inhomogeneous cylindrical shell on visco-elastic foundation with respect to axis (G.R.Mirzayeva).

It is assumed that a cylindrical shell with annular cross section is on the homogeneous viscous elastic foundation.

The problem is solved using the separation of variables and the method Bubnov Galerkin of orthogonalization, as well as calculations. The obtained results show that the orthotropic character and inhomogeneity of the shell influences on the value of the frequency.

Work E. Analysis of axially loaded annular cylindrical shells (F.I.Huseynov).

In this paper, one of the elements (dF) of the surface of a shell of an arbitrary shape is considered for its calculation according to the momentless theory. The horizontal projection of the considered element dF is a rectangle. Its surface $x = const$ and $y = const$.

Work F. Stability of elastic-plastic rectangular plate on inhomogeneous foundation (E.H.Shahbandayev).

The problem is solved on the basis of the Karman – Ilyushin criterion. The stability equation for bending is a 4th order differential equation. The problem is solved by the Bubnov – Galerkin method and an analytical formula for determining the critical force is derived.

On scientific-organizational activity

The department seminars are held once in two weeks (on Friday) at 12:00.

The department collaborators V. J.Gadjiev , G.R.Mirzoyeva, Kh.I.Musayev gave practical courses to fourth year students of BSU.

Two doctor of sciences dissertation were reviewed. The initial discussion of one ph. d. dissertation was held together with “Applied mathematics” department. The department collaborators continue their scientific-pedagogical activities.

V.J.Gadjiev works as a part time professor. He was at the head of technical sciences department of the Republican scientific-practical conference devoted to 95 years of the national leader Heydar Aliyev and made two reports.

On may 29, 2018, supervised by V.J.Gadjiev at the Scientific Connil of AzACU V.Sharifov defended his phil. doctor degree in structural mechanics.

V.J.Gadjiev is a member of “Journal of Structural Engineering of Applied mathematics” published in Turkey in the English language.

G.R.Mirzoyeva is a part time teacher at State Management Academy under the President of the Republic of Azerbaijan. She has supervised three holders of master’s degree.

One of them has submitted the dissertation work to the scientific commit.

In the report period, V.J.Gadjiev was an opponent of one doctor of science dissertation on technical sciences and 2 phic. Doct.dissert.

There is one candidate for a degree in the department.

Head of department

doct.ph.math.sci.prof. V.J.Gadjiev