

THE MECHANICAL APPLIED ENGINEERING

DESTINATION:

The laboratory is designed for military and civilian second and third year students, for all specializations, and it enables students to make experiments which highlight the principles of mechanics and strength of materials. The complexity of the equipment and stands in this laboratory recommends it to graduate students, and to ship crew members, too; it gives training for those who want to specialize in determining the faults in machine operation



STRUCTURE AND CAPABILITY:



Universal vibration testing TM 150 stand

Possible experiments:

- free and forced vibrations (with / without damping) of the rods;
- experiments with pendulums (mathematical pendulum and physical pendulum), and spring-mass system;

The stand is equipped with recording and evaluation of measured data using the TM 150.20 PC

PT 500 Stand for machine fault identification

Possible experiments:

- elastic shafts; flexural vibrations, critical speed, and resonance;
- dynamic balancing (on two planes);
- simulating the presence of a crack in a rotating shaft in motion;
- operational behavior of damaged bearings ;
- study of factors influencing the operation of belt transmission

TM 110 stand for observing fundamentals of statics

On this stand numerous experiments in the field of statics can be performed , i.e. decrease / addition of forces; articulated levers combined systems; fixed and mobile pulleys; hoists; torque forces; reactions in bearings.

The following additional equipment extends the experiments, as follows:

- TM 110.01- experiments on the inclined plane and friction;
- TM 110.02- experiments with four and six-wire hoists, and with the differential hoist;
- TM 110.03- experiments with different gear system

Experimental instalation SE 110.47 - Virtual mechanical work

The SE 110.47 experimental instalation can be used to determine the linear deformation and the rotation of a rod loaded with forces and moments. In particular, this stand illustrates the principle of virtual mechanical work.



Stand for torsion of SE 110.29 rods

On this stand experiments on the bending of rods in torsion can be performed.

Installation for the study of rods deformation in torsion and in bending WP 100

Possible bending experiments:

- determining elasticity modulus of various materials
- dependency of deformation on the width and height of the profile, and also, on its external load, and the distance between bearings
- comparison referring to bending resistance of different shapes of profiles having the same cross-sectional area;
 - simply supported beam and embedded beam under different loading conditions;
 - experimental determination of axial geometric moments of inertia;
 - mounting holes.

Possible torsion experiments :

- determining the transverse elasticity modulus of various materials
- size of the angle of rotation depending on the length of the rod;
- the relation between of the angle of rotation and the diameter of the rod.

Stand for checking the hypothesis of the theories of resistance WP 130

On this stand the verification of experiments on theories of resistance and of the corresponding equivalent tensions are performed.

Stand for asymmetric bending FL 160

On this stand experiments on rod bendings (pure bending, generalized or oblique bending, shear center).

Stand for buckling experiments WP120

Possible experiments:

- validation of Euler's theories on buckling
- influence of the different conditions of leaning, of length and diameter of the rod, as well as of the material characteristics, on the rod buckling

FL 210Polariscope

The FL 210 device is an annex module, compatible with all standard projectors, which creates conditions for experiments based on photoelasticity. Light (polarized and monochromatic) is used to visualize the distribution of tensions in sensitive fotoelastic materials, whose shape is correspondent to those in metals.

Stand for the analysis of tension and deformation of FL 210 membranes

The stand is dedicated to the study of stress/tension and deformation of membranes subjected to compression, and allows performing the following experiments:

- measurement of specific strains with strain gauges;
- measurement of maximum deformation with a measuring instrument with a dial (comparator);
- determination of radial and tangential stresses;
- determination of the main stresses direction.

TM 630 Gyroscope

On this stand the demonstration of centered gyroscope properties can be performed.

TM 200 Installation - fundamentals of mechanical friction

The stand is dedicated to the study of friction (tribometer), and allows emphasizing the following aspects:

- the relationship between friction and the normal reaction force;
- influence of speed, roughness of surfaces, of the ar friction ea of contact surfaces, and of the pair of materials on the extent of the friction force;
- the difference between static friction and kinematic friction.