

### III panarmenian science olimpiad

#### Physics

#### Syllabus

#### 9<sup>th</sup> grade

1. Uniform linear and circular motion. Motion along and revers to the water flow.
2. Force: wieght, elastic force, friction. Hooks law.
3. Lever principal. Blocks and pulleys.
4. Pressure. Hydrostatic pressure, buoyancy, floatation.
5. Work and power. Energy.Conservation law of mechanical energy.
6. Heat. Specific heat capacity.Heat balance equation.Thermal equilibrium.
7. Melting and crystalizing of materials. Evaporation and condensation.Latent heat.
8. Charging (electrically) objects. Current.Parallel and series connection of conductors.
9. Heat dissipation and power in electric circuits.
10. Reflection and refraction of light. Lenses, image formation by lenses (including formula for image distancefrom lens).

### III panarmenian science olimpiad

#### Physics

#### Syllabus

#### 10<sup>th</sup> grade

1. Uniform linear motion. Relativity of motion. Uniformly accelerating motion. Graphical representation of motion.
2. Elastic force. Hooke's law. Gravitational interaction. Weight. Friction. Newton's law in action.
3. Equilibrium of objects. Centre of inertia and centre of mass. Rotational equilibrium of objects under influence of several torques.
4. Work. Kinetic and potential energy. Conservation of mechanical energy.
5. Momentum. Conservation law of momentum. Collisions.
6. Heat. Specific heat capacity. Thermal equilibrium. Heat conduction.
7. Melting and crystallizing of materials. Evaporation and boiling. Latent heat.
8. Current. Ohm's law. Electric circuits. Parallel and series connections of conductors.
9. Heat dissipation and power in electric circuits.
10. Pressure. Hydrostatic pressure. Buoyancy, floatation.

### III panarmenian science olimpiad

#### Physics

#### Syllabus

#### 11<sup>th</sup> grade

1. Uniform linear motion. Relativity of motion. Uniformly accelerating motion. Graphical representation of motion.
2. Elastic force. Hooke's law. Gravitational interaction. Weight. Friction. Newton's law in action.
3. Work. Kinetic and potential energy. Conservation of mechanical energy.
4. Momentum. Conservation law of momentum. Collisions.
5. Pressure. Hydrostatic pressure. Buoyancy, floatation.
6. Equation of state. Graphical representation of gas processes (isothermal, isobaric, isochoric).
7. Internal energy. Work in thermodynamics. Heat. The first law of thermodynamics and implementation of it. The efficiency of heat engines.
8. Coulomb's law. Electric field strength. Principle of superposition. Field potential. Capacitance.
9. Current. Ohm's law. Parallel and series connections of conductors. Terminal voltage drop and electromotive force.
10. Magnetic field. Forces on current carrying wires and moving charges. Motion of charged particles in magnetic field.
11. Electromagnetic induction. Faraday's law. Self-induction, inductivity.
12. Mechanical oscillations and waves.
13. Electromagnetic oscillations. LC circuits. AC circuits.