

YOGENDRA M. PANTA, Dept. of Mechanical Engineering, West Virginia University Institute of Technology, Beckley, WV, 25801. WILLIAM CHURCH, Dept. of Mechanical Engineering, West Virginia University Institute of Technology, Beckley, WV, 25801. Synchronizing the Teaching Resources of Energy Conservation Principle in Mechanical Engineering Courses

The conservation of energy, the conservation of mass, and the conservation of momentum are three fundamental concepts (or laws) of physics that are regularly reviewed in several undergraduate engineering courses. Mechanical energies in the form of kinetic and potential forms are the most easily understood forms of energy in engineering dynamics courses. Fluid flow energies related to pressure, velocity, elevation, fluid friction, pump, and turbine are covered in a fluid mechanics course. In a thermodynamics course, the first law deals with heat transfer and work done that causes a change of internal energy in a system. Aerospace engineers normally simplify a thermodynamic analysis by using intensive variables also called specific variables. In all these courses, the conservation of energy states that the amount of energy remains constant, that means that energy is neither created nor destroyed but transferable from one form to another, keeping the total energy same within a fixed domain.

In several instances, students are either misunderstood or unclear about energy and its conservation concepts, however those very concepts are reviewed over and over in multiple courses. Through an integrative teaching approach that maps the smooth flow of energy and its conservation concepts in several undergraduate mechanical engineering courses, we are relating our shared teaching resources of the energy conservation principle. In this session, we present our pilot study on the synchronization of resources teaching the energy conservation principle in a sequence of undergraduate courses and our mitigation plan to clear up students' misunderstanding on the energy conservation.

Keywords

Energy, Kinetic Energy, Potential Energy, Conservation of Energy, COE, Thermodynamics, Fluid Mechanics, Heat Transfer, Dynamics, Synchronization of Teaching Resources for Conservation of Energy