UNIVERSITY OF PANNONIA

SUBJECT DATASHEET

Semester: 2011/12/1

Subject: Applied Mechanics- Vehicle Mechanics

Code: VEMKGEM444M

Responsible department: Department of Mechanical Engineering

Responsible department code: MKGE

Responsible lecturer: dr. Imre Timár

Educational objectives:

Learning the basics of the finite element method and construction of vehicles

Detailed content of the subject:

Finite element analysis: Background of the method, history. Introduction to the use of a finite element program.

Finite element analysis: Energy methods, discrete systems. Energy methods, continuous systems.

Finite element analysis: Rayleigh-Ritz method applied to a tensioned rod. Solution of the problem of a tensioned rod with finite element method.

Finite element analysis: Method of structural analysis, stiffnes matrix of a tensioned rod in local coordinate system. Examination a system of rods.

Finite element analysis: Stiffnes matrix of a tensioned rod in global coordinate system. Examination of a latticed structure.

Finite element analysis: 2D-problems, theory. 2D-problems, linear and quadratic finite elements.

Finite element analysis: 2D-problems, problem solving with computer program. Test.

Introduction to applied mechanics. Why applied mechanics? Different engineering science branches in applied mechanics. Practical and active examples. Analysis methods in applied mechanics.

Relationship between applied mechanics and vehicle mechanics. Different type of vehicle motors: Otto motor Diesel motor.

Engine parts. Two stroke engine-four stroke engine.

Cooling and lubrication system. How Otto motor works? Motor characteristics. Diesel motor. Other motor types.

Powertrain, transmission, clutch.

Brake system, wheel system, suspensions.

Students' presentation.

Requirements:

One test and one presentation.

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Requirements:

Required and suggested references:

Dr. Fodor Tamás-Dr. Orbán Ferenc-Dr. Sajtos István: Mechanika, Végeselem-módszer, Elmélet és alkalmazás, Szaktudás Kiadó Ház, Budapest, 2005

M. Csizmadia Béla-Nándori Ernő: Mechanika mérnököknek, Modellalkotás, Nemzeti Tankönyvkiadó, Budapest, 2003