



FREDERICK UNIVERSITY CYPRUS

DEPARTMENT OF MECHANICAL ENGINEERING

Subject:	Machines Elements and Analysis II – AUTO 309
Academic Year:	-
Lecturer:	Dr. Antonios Lontos
Number of periods per week:	3+1(Laboratory Work)
Number of total weeks:	14

Course Outline:

- Manual and automatic gearboxes, synchronisers, continuously variable transmissions, traction control, Types of gears, Tooth system, Contact ratio, Force analysis, Applications of gear design and power transmission in Automotive Industry.
- Design and calculation of Spur and Helical Gear systems.
- Design and calculation of Bevel and Worm Gear systems, Stresses and Strength.
- Design and selection of vehicle springs, Suspension springs and shock absorbers, Stresses in helical springs, Deflection of helical springs, Extension and Compression springs, Springs material, Fatigue loading, Design of springs, Miscellaneous springs.
- Vehicle Clutches and Brakes, Brake system components and their characteristics, Brake analysis, anti-lock braking systems, Energy consideration, Temperature rise, Friction materials, Other brake technologies.
- Vehicle belts and chains, Power transmission, efficiency, Flat belts, Belt drive, synchronous belts, Roller chain, Flexible shaft.

Assessment:

Final exam: 60%
Coursework: 40%

The passing mark is 50%.

Coursework:

Assignment 1: Gears - Bevel and Worm Gears (March)**
Assignment 2: Springs (April)**
Assignment 3: Brakes or Clutches or Assembly (May)**

** The dates of the tests and assignments are likely to change slightly.

Grading system:

Assignment 1 (60%), Assignment 2 (20%), Assignment 3 (20%)

Textbooks:

- Fundamentals of Machine Elements, B. J. Hamrock, B. Jacobson, S. R. Schmid, McGraw-Hill
- Mechanical Engineering Design, Ch. R. Mischke, J. Edward Shigley, McGraw-Hill

References:

- Machine Design: An Integrated Approach by Robert L. Norton, Robert L Norton, Prentice Hall, 2nd edition, 2000
- Machine Elements in Mechanical Design by Robert L. Mott, Prentice Hall, 3rd edition
- Mechanical Design, An Integrated Approach, Ansel C. Ugural, McGraw Hill
- Design of Machine Elements and Machines, Jack A. Collins, George H. Staab, Henry R. Busby, John Wiley & Sons
- Mechanisms and mechanical devices by Neil Clater, Nichocals P. Chironis, Third Edition
- Fundamental of Machines Components Design, Robert C. Juvinall, Kurt M. Marshek, Third Edition