Course unit title:	**Machine Elements and Machines in Oil and Gas Industry**		
Course unit code:	OG301		
Type of course unit:	Compulsory (for Oil and Gas Engineering Specialization)		
Level of course unit:	B.Sc		
Year of study:	3		
Semester when the unit is delivered:	6th		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Antonios Lontos		
Learning outcomes of the course unit:	• Classify the different ways of transmitting motion and power. • Design and calculate spur and helical gears. Calculate forces on gears. • Design and calculate bevel and worm gears. • Calculate clutches and brakes. • Calculate and design power transition systems using belts. • Calculate roller chains, wire ropes, flexible shafts. • Combine the theoretical and practical knowledge in order to calculate or maintenance lifting and transportation machines in Oil and Gas Industry. • Analyze and calculate heavy transportation equipment used in Oil and Gas Industry		
Mode of delivery:	Face-to-face		
Prerequisites:	ME316	Co-requisites:	None
Recommended optional program components:	NONE		
Course contents:	• Gears: Gear tooth geometry, tooth systems, gear, trains, gear box design, design of helical, bevel and worm gears from strength and wear considerations, Design of Machine Tools Gear Box; Speed and Feed Gear Boxes; • Housings, The Function of Housings, Materials for Housings, Design of Housings, Housings Split through the Axes of Shafts, Design of Mounting Feet, Design of Lifting Elements, Housings Split at Right Angle to the Axes of the Shafts, Nonsplit Housings, Deformations and Stiffness Problems, Housing Seals , Sealing of Rigid Connections (Static Seals), Sealing Movable Joints, Noncontact Seals, Contact Seals, Combined Seals • Clutches and Breaks, Brake analysis, Band-type clutches and brakes, Energy consideration, Temperature rise, Friction materials. • Competition of the design of a power transmission, Flat belts, Roller chain, Wire rope, Flexible shaft. • Lifting and transportation machines, Heavy Lift Equipment, Hydraulic Gantry Systems, Hydraulic Strand Jacks, Lifting towers, Skidding Systems, Elevated Runways • Heavy Transportation Equipment, Jumper Bridge, Beam and Dolly Transporters, Goldhofer Self-propelled Trailers, Prime Movers and Over-the-Road Tractors		
Recommended and/or required reading:	None		
Textbooks:	• Fundamentals of Machine Elements, B. J. Hamrock, B. Jacobson, S. R. Scmid, Mcgraw-Hill • Mechanical Engineering Design, Ch. R. Mischke, J. Edward Shigley, McGraw-Hill		
References:	• Mechanical Design, An Integrated Approach, Ansel C. Ugural, Mcgraw Hill, 2004.		

	• Design of Machine Elements and Machines, Jack A. Collins, George H. Staab, Henry R. Busby, John Wiley & Sons, 2002 • Mechanisms and mechanical devices by Neil Clater, Nichocals P. Chironis, Third Edition 2001 • Fundamental of Machines Components Design, Robert C. Juvinall, Kurt M. Marshek, Third Edition, 2000 • 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, 1998
Planned learning activities and teaching methods:	Lectures, laboratories and tutorials are used in this subject and assignments are performed to evaluate the students understanding of the subject matter. A description is given at the beginning of the course in order for the students to get enough information on the main subjects of the course.
Assessment methods and criteria:	• Assignments 20% • Mid-Term Exam: 20% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No