

Introduction of Mechanical Engineering

Code: MK3GEPTG05GX17

ECTS Credit Points: 5

Evaluation: Exam

Year, Semester: 1st year, 1st semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2+2

Topics:

Topics: SI units, basic and derived quantities, prefixes. Translational and rotational motion, moment of inertia, torque, work, power. Conservation of energy, viscous friction, dry friction, rolling resistance. Efficiency, power loss of machines. Bernoulli's equation, law of continuity, Venturi tube, water jet force. Entropy, specific heat capacity, latent heat, temperature-entropy diagram for steam. Classification of machines, power drives. Drive gears, flywheels, breaks, springs, bearings. Otto engines, Diesel engines. Positive displacement pumps, centrifugal pumps and gear pumps. Fans, compressors. Steam boilers, steam turbines, steam power plants, water turbines, wind power plants. Adaptation of prime movers and driven machines.

Literature:

Compulsory:

- 1. Mechanical Engineers' Handbook, Volume 4 John Wiley & Sons, 2006. ISBN: 9780471719885
- 2. M. R. Lindeburg: Mechanical Engineering Reference Manual 13th. Professional Publications Inc., 2006. ISBN-13: 978-1591264149 ISBN-10: 1591264146

Schedule

1 st week Registration week	
2nd week: Lecture: SI units, basic and derived quantities, prefixes. Practice: Overview of The International System of Units (SI). Elaboration of kinetic and kinematic exercises.	3rd week: Lecture: Translational and rotational motion, moment of inertia, torque, work, power Practice: Elaborating exercises in the following topics: losses of machines, efficiency, specific consumption, economical efficiency.
4th week: Lecture: Efficiency, power loss of machines. Practice: Elaborating exercises in the topic of flywheels and hydrostatics. Utilization of Bernoulli's principle.	5th week: Lecture: Bernoulli's equation, law of continuity, Venturi tube, water jet force. Practice: Elaborating calculation exercises in the field of hydrodynamics.
6th week: Lecture: Entropy, specific heat capacity, latent heat, temperature-entropy diagram for steam.	7th week: Lecture: Classification of machines, power drives. Drive gears, flywheels, breaks, springs,

Practice: Elaborating calculation exercises: the air as energy source.

Practice: Elaborating calculation exercises: machines transmitting fluid and the water vapor as energy source.

8th week: 1st drawing week

9th week:

Lecture: Otto engines, Diesel engines.

Practice: Elaborating calculation exercises in connection with water vapor.

11th week:

Lecture: Fans, compressors

Practice: Elaborating calculation exercises: steam-engines, steam-boilers.

13th week:

Lecture: Water turbines, wind power plants.

Practice: Elaborating calculation exercises: water turbines, topics of hydraulic and pneumatic machines.

10th week:

Lecture: Positive displacement pumps, centrifugal pumps and gear pumps.

Practice: Elaborating calculation exercises: machines transmitting gas.

12th week:

Lecture: Steam boilers, steam turbines, steam power plants.

Practice: Elaborating calculation exercises: internal combustion engines.

14th week:

Lecture: Adaptation of prime movers and driven machines

Practice: Elaborating calculation exercises in the field of machine groups.

15th week: 2nd drawing week

Requirements

A, for a signature:

A, for a signature: Attendance at lectures is recommended, but not compulsory. Participation at practice classes is compulsory. A student must attend the practices and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. A student can't make up a practice with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, being discussed with the tutor. Active participation is evaluated by the teacher in every class. If a student's behavior or conduct doesn't meet the requirements of active participation, the teacher may evaluate his/her participation as an absence due to the lack of active participation in class. During the semester there are two tests: the mid-term test in the 8th week and the end-term test in the 15th week. Students have to sit for the tests.

B, for grade:

B, for a grade: The course ends in an exam grade (ESE). The grade for the test is given according to the following table: Score Grade 0-59 fail (1) 60-69 pass (2) 70-79 satisfactory (3) 80-89 good (4) 90-100 excellent (5)