Course Structure

Course Code : **SM7203**

Course Title : **Industrial Machine Design**

Credit Hours : **3**

Course Description

Conceptual design, engineering drawing,

Course Objectives

This course aims to serve the candidates by introducing fundamentals of smart energy machinery design, Engineering Materials, stress analysis, Mechanism design, Power transmission systems, Gear design and force analysis, bearing, Gearbox design, Brake design.

Course Topics

- General topics
  Conceptual design
  Dimensioning
- Basics of engineering drawing
- General topics
  Fits and tolerances
- Engineering Materials
  Carbon steels
  Cast Iron
  IS designation of low and medium carbon steels
- Engineering Materials
  Stress/Strain curve
  Tension test and specimen geometry
  Hardness test
- Engineering Materials
  Fatigue test
  Goodman and Soderberg curves
- Basics of stress analysis
  Normal, shear, torsion, bending, bearing and crushing stresses
  Strains, Young's modulus, and rigidity modulus
  Thick/Thin cylinders
- Basics of stress analysis
  Elastic failure Treska's theory
  Welded and bolted joints
- Mechanism design
  Slider crank mechanism
  Four bars mechanism

Course Structure

- Power transmission systems
  Key
  V-Belts and pulleys
  Sprocket
  gears
- Gear design and force analysis
  Spur gear
  Helical gear
  Bevel gear
- Worm and worm gear
  Bearing calculations
- Deep groove ball bearing
  Needle bearing
  Tapered bearing
- Double row ball bearing
- Wind turbine design
  Output power calculation
  Blade design and installment
- Gearbox design
- Brake design
  Solar panel tilting mechanism
- Mini-project
  Mini project seminar

References

- Machine Design by Khourmi
- Machine Design , Shigley