

Preparing for Final Exam

- Study guide for Midterm #1
- Study guide for Midterm #2

You must be able to:

1- Calculate gear geometry parameters:

- Diametral Pitch P
- Pitch diameter d
- circular pitch p
- base circle diameter d_b
- Addendum a
- Dedendum b
- Diameter of addendum circle
- Tooth height

2- Calculate the gear ratio of a pair of gears in mesh

- From speed ratio
- From number of teeth
- From size of pitch diameters
- From size of base circle diameters

3- Check for interference (under cutting) by calculating minimum number of teeth needed for no interference

4- Calculate contact ratio using Excel worksheet

5- Calculate Center distance between two gears in mesh given gear geometry data.

* 6- State the effect of center distance variation (due to tolerances) on:

- Pressure angle ϕ
- Contact ratio
- gear ratio
- Actual pitch diameters

7- Calculate the rpm of all gears in a regular gear train.

8- Calculate the rpm of all gears and shafts of any planetary gear train.

9. Calculate gear forces:

- Normal (total) force F_n
- Tangential force F_t (from hp & rpm)
- Radial force F_r

10. Calculate factor of safety against gear tooth breakage using AGMA stress and strength formulas

11. Calculate factor of safety against gear surface damage using AGMA contact stress and contact strength formulas.