Course of Mechanical Design and Machine Elements

Homework 2: Design and verification of a gearbox

It is requested to:

1) Determine the torsional vibration natural frequencies of the system as a function of the polar moment of inertia of the user attached to the gearbox. Take a reasonable estimation of the inertia of the electric motor necessary to provide the requested power to the gearbox.
2) Determine the flexural critical speeds of the intermediate shaft of the gearbox. For the sake of simplicity, refer to an analysis model consisting of 1 disk representative of the inertia of the larger gear.