MECH 325 Reading Guide #2
Flexible Drives and Journal Bearings

1 Overview

The readings outlined in this guide are intended to prepare a foundation of knowledge and skills that will be used in the MECH 325 classes and tutorials.

This second reading assignment focuses on flexible drives, journal bearings, and rolling element bearings. This module has a large reading assignment, with approximately 22 pages of raw text (omitting examples, figures, and tables) in the required portion – plan your time accordingly. The readings are divided into two categories:

- **Required**: the primary source of material for the Readiness Assurance Process (RAP) Quiz. Each student is expected to complete the required readings.
- ***Beneficial:*** *additional analyses, derivations, explanations and examples to provide in-depth understanding of the course material. These readings help develop a more complete understanding of course concepts necessary for the tutorials, exercises, exams, and design projects. It up to you whether or not you do the beneficial readings.*

All readings are drawn from the course text: Budynas, R.G. and Nisbett, J.K., *Shigley's Mechanical Engineering Design*, McGraw-Hill. **11th Edition page numbers in bold**, 10th Edition in regular and 9*th Edition in italics*.

2 Readings

2.1 Belt Basics, Flat Belts, V-Belts, Timing Belts, and Wire Rope

Required: Section 17-1 (pp. **888-885,** 872-5**,** *880-3*) and part of 17-2 (pp. **885-90,** 875-80**,** 883-*8*). Basics and flat belts. Do not spend a great deal of time trying to interpret all of the equations – just try to get a general feel for the analysis.

Beneficial*: Examples 17-1 and 17-2*

Required: Section 17-3 (pp. **900-908,** 890-7**,** *898-905*). V-Belts. Concentrate on the text, skim over the equations, and do not concern yourself with the tables.

Beneficial*: Example 17-4*

Required: Section 17-4 (pp. **908-9,** 898-9**,** *906-7*). Timing belts.

Required: Section 17-5 (pp. **909-16,** 899-907**,** *907-15*). Roller chain.

Beneficial*: Example 17-5*

Required: Section 17-6 (pp. **917-25,** 908-14**,** *916-22*). Wire Rope.

Beneficial*: Example 17-6*

2.2 Journal Bearings

Required: Sections 12-1 and 12-2 (pp. **624-27,** 610-13**,** *618-21*). This section identifies the different types of lubrication (and different classes of journal bearings) that are used.

Beneficial*: Sections 12-4, 12-5 (*pp. **632-34,** 615-7**,** *623-5) and 12-7 (*pp. **639-40,** 621-23**,** *629-31). These sections outline some of the principles of using lubricating films with journal bearings. We will not be spending a large amount of time on this class of bearings, but it is important to know some of the basics. Do not be concerned by the references to earlier sections – just try to get the gist of how the lubrication works and the design parameters.*

Required: Sections 12-12 and 12-13 (pp. **661-63, 50-8,** 648-50, *656-58*). Section 12-15 (pp. **670--77,** 652-60**,** *660-68)* Boundary-lubricated bearings. Most of our attention will be paid to this class of sliding bearing. Read the text but do not concern yourself with the tables.

Beneficial*: Examples 12-9 and 12-10 (Examples 12-7 and 12-8 in Editions 9 and 10)*