209: Involute Spline Design & Rating

INSTRUCTOR:
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COURSE INFORMATION

Course Description
This course will address both geometry and rating of involute splines of various types. The types of spline joints and their applications will be discussed. Spline configuration variations, including half depth, full depth, and special function designs, will be addressed. Both fixed and flexible spline configurations will be examined in terms of usage and design. Lubrication methods, including grease, oil bath, and flowing oil, as well as coatings appropriate for various spline applications, are examined. Shear and compressive stress rating methods are discussed with analyses methodology presented in both equation and graphical methodology via various rating charts.

It is recommended that you spend a minimum of 1 hour reading and reviewing the material each day.

Course Rationale/Students Course Designed to Serve
Gearbox design engineers who utilize splines to transmit power between various elements within the gear system and to connect the gearbox to both input and output devices.

Learning Objectives:
- Explain involute splines and the various types
- Compare and contrast spline configuration variations
- Apply various lubrication methods to splines and spline applications
- Apply rating methods and analyze methodology

Required Textbooks (Provided by MPMA)
Involute Spline Design & Rating by Raymond J. Drago, PE

COURSE OUTLINE

I. What is an Involute Spline?
II. Types of Spline Connections
III. “Special” Spline Configurations
IV. Spline Failure Modes
V. Full Depth and Half Depth Spline Configurations
VI. Working and Fixed Splines
VII. Coatings and Surface Treatments
VIII. Lubrication
IX. Load Capacity Rating and Life Determination

STUDENT FEEDBACK AND GRADING PROCEDURES

Assignments
A self-graded assessment is administered during this course. Immediate feedback is given, and the material is reviewed by the instructor.

COURSE MANAGEMENT

Weather Delays and Cancelations
We will communicate any cancellations, delays or other concerns for safety prior to class via email, voicemail, and/or text message. Please be sure that we have all pertinent contact information as you travel to your class location.

Attendance for Domestic and International Students
Please be mindful that these are short, accelerated courses. Attendance is extremely important. If you are going to be absent from any class day, please contact the course coordinator.

Plagiarism, Cheating and other types of Misconduct
Plagiarism[1], cheating and other types of misconduct are unacceptable.

Students with Disabilities
Students requiring assistance and accommodation should complete the Special Accommodation Request form and submit it to our Education inbox at education@motionpower.org. Or we can be reached by calling 703-684-0211.

Grievance Procedures
Students who have concerns about the class are encouraged to contact any Education Department staff at education@motionpower.org or by calling 703-684-0211.

Outline Changes
The instructor reserves the right to modify the outline during the course of the class.

LEARNING AND OTHER RESOURCES

Links for writing resources:

- grammar.ccc.commnet.edu/grammar
- www.merriam-webster.com

Links for Math resources:

- www.sosmath.com
- Khan Academy on www.youtube.com

Links for time management, study skills and note taking resources:

- www.mindtools.com
- www.testakingtips.com

1 Plagiarism is defined as "the use or close imitation of the language and thoughts of another author and the representation of them as one's own original work."

Links for career resources:

- https://www.agma.org/newsroom/jobs/

Industry News:

- https://www.agma.org/newsroom/industry-news/