107: Analytical Gear Chart Interpretation

INSTRUCTOR:
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COURSE INFORMATION

Course Description
This course is an introduction to the methodology of analytical gear inspection and the evaluation and interpretation of the resulting data. The application of this information to identify and correct manufacturing errors will begin to be explored. Additionally, it reviews chart interpretation and applies inspection data to understand the causes and cures of manufacturing errors. Many chart examples are used to understand cause and effect.

Who Should Attend
This course suits people relatively new to gear manufacturing or inspection. Quality control and manufacturing staff will better understand how inspectors measure and evaluate gears. Quoting, processing, and sales staff will learn to read inspection reports beyond the "wiggly lines."

Learning Objectives

- Identify major gear characteristics measured and methods used
- Evaluate pitch, profile and helix
- Use AGMA ANSI ISO analysis methods
- Compare/contrast 2008-A88 with the current standard AGMA ANSI ISO 1328-1-B14
- Understanding errors from various gear manufacturing processes
- Hobbing
- Shaping
- Shaving
- Grinding
- Understanding the relationship between inspection charts and manufacturing kinematics
- Using inspection chart information to determine the root causes of errors

Required Textbook
Textbook will be provided by MPMA

COURSE OUTLINE

Nomenclature review
    Gear terminology

What is measured and how?
    How gears are measured
    CNC analytical gear inspection
        Pitch
            Single pitch

- Cumulative pitch
- Analyzed runout
- Helix
- Is it metal, helix or lead?
- Profile

Evaluation of the trace data
- AGMA ANSI ISO 1328-1-B14 standard
- Total
- Form
- Angle
- Crown
- Specified profile, specified helix
- AGMA 2000-A88
- Real world additional requirements on drawings
- Band fit vs analyzed numerical results

What does it mean and what to do about it?
- Some Things to Consider
- Pitch Errors
- Helix Errors
- Profile Errors

Interpreting the charts with examples
- Helix variation
- Patterns and causes
- Profile variation
- Patterns and causes
- Hob runout and solution
- Pitch variation
- Patterns and causes

STUDENT FEEDBACK AND GRADING PROCEDURES

Assignments
There will be a short self-graded quiz at the end to show knowledge transfer.

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

Links for career resources:

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

Industry News:

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

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."