



Analytical Gear Chart Interpretation

INSTRUCTOR:

Dwight Smith

Email: dsmith@colemfgsystems.com

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

People relatively new to gear manufacturing/inspection; Quality control people as well as manufacturing people will benefit from better understanding how gears are measured and evaluated; Others from quoting, processing and sales also can gain knowledge of 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 AGMA

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 Cancellations

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

Plagiarism¹, 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 Stephanie Smialek, Education Manager at smialek@motionpower.org. She can be reached at 773-302-8026.

Grievance Procedures

Students who have concerns about the class are encouraged to contact Stephanie Smialek, Education Manager, at smialek@motionpower.org or 773-302-8026.

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.testtakingtips.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."