Operator Hobbing and Shaper Cutting

INSTRUCTOR:
Peter Grossi
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COURSE INFORMATION

Course Description
Learn and understand fundamentals of gear manufacturing. Acquire knowledge and understanding of gear nomenclature, hobbing and shaping of spur and helical gears, and splines. Learn and understand hobber and shaper machine set-up, as well as gear tooth element inspection. Understand the manufacturing process before gear tooth cutting, as well as post cutting processes. Apply concepts to further finishing processes, i.e. heat treat, gear tooth shaving and grinding and/or skiving. Gain knowledge to establish a solid foundation for all basic gear manufacturing.

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

Who Should Attend
Entry level & existing hobbing and shaper machine operators, hobbing / shaping supervisors, hobbing / shaping process engineers.

Learning Objectives
1) Identify gear blank inaccuracies
2) Establish proper machine set-up procedures/practices
3) Define gear tooth element nomenclature
4) Identify gear tooth errors resulting from hobber/shaper machine set-up errors, as well as cutter sharpening errors
5) Interpret gear inspection charts for quality level

Required Textbooks (Provided by AGMA)
Operator Hobbing and Shaper Cutting manual by Peter Grossi.

COURSE OUTLINE

- Discuss gear tooth nomenclature, and gear tooth errors caused by machine set-up and tooling errors.
- Reviewing blueprint and process sheets for required gear data, including:
  Type of gear
  Number of teeth
  Pitch
  Pressure angle
  Spur/Helical gear
  Finish or pre-shave cutter
  Tooth Depth or Root Diameter
  Right or left hand for helical gears
  Concentricity notes
• Mounting cutter tooling and cutter onto machine
• Indicating cutter
• Setting head angles on hobbing machine for spur and helical gears
• Mounting and indicating of work arbor on machine
• Mounting and indicating of work piece on work arbor.
• Installing index, feed, RPM, and differential (if helical) change gearing.
• Setting hob to start on first lead
• Setting length, type and direction of cut
• Touching off on OD of blank with cutter to establish depth of cut.
• Counting number of teeth to validate index change gears.
• Setting depth of cut for preliminary rough cut.
• Determining factors for depth of cut adjustments, and measurement over pins dimension or span measurement over specified number of teeth.
• Finished piece inspection

STUDENT FEEDBACK AND GRADING PROCEDURES

Assignments
Assignments and learning activities are given and directed at the discretion of 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. Rosemarie Bundoc, Education Manager, bundoc@agma.org or Stephanie Smialek, Education Coordinator, smialek@agma.org

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 Coordinator, at smialek@agma.org. She can be reached at 703-838-0069.

Grievance Procedures
Students who have concerns about the class are encouraged to contact Stephanie Smialek, Education Coordinator, at smialek@agma.org or 703-838-0069.

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.”
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/