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**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/best practices
3. Define gear tooth element nomenclature
4. Identify gear tooth errors resulting from hobber/shaper machine set-up inaccuracies, as well as cutter sharpening inaccuracies
5. Interpret gear inspection charts for AGMA quality level

**Required Textbooks (Provided by AGMA)**

*Operator Hobbing and Shaper Cutting* manual by Peter Grossi.

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| COURSE OUTLINE |

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| * Discuss gear tooth nomenclature, and gear tooth errors caused by machine set-up and tooling inaccuracies.
* Reviewing blueprint for required gear data, including:

Type of gearNumber of teethPitchPressure angleSpur/Helical gearTooth Depth or Root DiameterRight or left hand for helical gearsGear tooth element requirements / AGMA tolerances* Reviewing process sheets for required gear data, including:

Type of cutter: Hob: Finish or pre-shave, pre-grind/pre-skive Shaper cutter: spur or helicalMachine feed / speed* Machine set-up procedures:

Mounting cutter tooling and cutter onto machineIndicating cutterSetting hob head angle on hobbing machine for spur and helical gearsMounting and indicating of work arbor on machine Mounting and indicating of work piece on work arbor.Establish / installing index, feed, RPM, and differential (if helical) change gearing. Setting hob to start on first leadSetting length, type and direction of cutTouching 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 |

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| **STUDENT FEEDBACK AND GRADING PROCEDURES** |

**Assignments**

Assignments and learning activities are given and directed at the discretion of the instructor.

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| 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]](#footnote-1), cheating and other types of misconduct are unacceptable.

**Students with Disabilities**Students requiring assistance and accommodation should complete the [Special Accommodation Request form](http://www.graduateschool.edu/images/stories/AcademicPrograms/AdmissionsApplicationGuideD3.pdf) and submit it to Stephanie Smialek, Education Manager at smialek@agma.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@agma.org or 773-302-8026.

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

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| LEARNING AND OTHER RESOURCES |

**Links for writing resources:**

* grammar.ccc.commnet.edu/grammar
* [www.merriam-webster.com](http://www.merriam-webster.com)

**Links for Math resources:**

* [www.sosmath.com](http://www.sosmath.com)
* Khan Academy on www.youtube.com

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

* [www.mindtools.com](http://www.mindtools.com)
* [www.testakingtips.com](http://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.” [↑](#footnote-ref-1)