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**Steels for Gears Applications**

**INSTRUCTORS:**

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| **COURSE INFORMATION** |

**Course Description**

Gain a basic understanding of steel and its properties. Learn to make use of steel properties in an application and understand the potential that different steel and heat treatment options can offer. Explore how performance of the material depends on how the steel is produced.

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

**Who Should Attend**

The course is intended to support gear engineers, gear designers, material specialists or metallurgists at OEMs, Tier 1s, Tier 2s, etc., production engineers, technicians and managers.

**Learning Objectives**

* Describe how material properties affect by steel quality and heat treatment.
* Describe how stresses are introduced by heat treatment process and surface modification treatments.
* Explain how to select a steel and heat treatment combination to meet the demands of the application
* Review influence of material selection on the manufacturing of components
* Discuss how to verify and specify required steel properties

The training will be a mix of presentations and workshop activities. Discussions during the presentations are encouraged. The training will end with an electronic diagnostic so please bring mobile phone, tablet or laptop to the training.

**Required Textbooks**

**Textbook will be provided by AGMA**

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| COURSE OUTLINE |

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| 1. Basic introduction to steel in fatigue applications 2. Matching the applied load with material strength and residual stresses. 3. Examples of standards – from a material perspective 4. Strength of material – a combination of composition and heat treatment. 5. Heat treatment and surface enhancement processes 6. Fatigue – controlled by defects in high strength steel 7. Steel making and metal working – how to control defects in steel 8. Quantification of steel – old and new methods 9. Manufacturing – How different steel types and qualities affect the manufacturing 10. Summary – looking at the whole process from design to manufacturing |

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| **STUDENT FEEDBACK AND GRADING PROCEDURES** |

**Assignments**

A Pre-test and post-test are administered during this course. Immediate feedback is given and the material is reviewed by the instructor.

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| COURSE MANAGEMENT |

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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](mailto: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](mailto: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 |

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**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)