The International Accreditors for Continuing Education and Training

American Gear Manufacturers Association (AGMA) is accredited by the International Accreditors for Continuing Education and Training (IACET). AGMA complies with the ANSI/IACET Standard, which is recognized internationally as a standard of excellence in instructional practices. As a result of this accreditation, AGMA is accredited to issue the IACET CEU. American Gear Manufacturers Association was approved and active status began December 2017. A renewal occurs every 5 years to ensure compliance with the ANSI/IACET Standards. This accreditation focuses on the quality of AGMA Education and Training program.

AGMA Education meets the standard requirements which include:

<table>
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<tr>
<th>CATEGORY</th>
<th>TITLE</th>
<th>WHAT DOES IT MEAN?</th>
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<tbody>
<tr>
<td>Category 1</td>
<td>Provide Organization, Responsibility, and Control</td>
<td>We have an established system for compliance with IACET Standards</td>
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<td>Category 2</td>
<td>Provide Learning Environment and Support Systems</td>
<td>Our learning environments and support system reflects the intent/learning outcomes of the programs and the programs achieve the learning outcomes</td>
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<td>Category 3</td>
<td>Planning and Instructional Personnel</td>
<td>We have qualified personnel planning and conducting our programs</td>
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<td>Category 4</td>
<td>Needs Assessment</td>
<td>We have a process for conducting a formal needs analysis for the learning event that guides the development of planned learning outcomes and learning event design</td>
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<td>Category 5</td>
<td>Learning Outcomes</td>
<td>Course learning outcomes are based on identified needs and they are clearly provided to learners. They are measurable, achievable, realistic, and time-based</td>
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<td>Category 6</td>
<td>Content and Instructional Methods</td>
<td>Our methods are appropriate for each program</td>
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<td>Category 7</td>
<td>Assessment and Learning Outcomes</td>
<td>We have established methods to assess achievement of learning outcomes</td>
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<td>Category 8</td>
<td>Awarding the IACET CEU and Maintaining Learner Records</td>
<td>We have established methods to award CEUs and a system to maintain, protect and provide training records</td>
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<tr>
<td>Category 9</td>
<td>Evaluation of Learning Events</td>
<td>We systematically evaluate all learning events and content to ensure we are providing the best possible learning experience</td>
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CONTINUING EDUCATION UNITS

As an IACET Accredited Provider, AGMA offers CEUs for its programs that qualify under the ANSI/IACET Standard. The IACET/CEU (CEUs) are calculated based on the number of minutes for instruction. Non-instructional portions of an activity are not considered learning time and, therefore, are not added to the instructional minutes. One CEU is equal to 10 hours of instruction. The learning activities allowed to receive CEU awards are face-to-face classes, distance courses, competency-based courses, and other learning events that meet the IACET/ANSI Standards. Partial credit or adjusted CEUs will not be awarded for individuals who do not successfully meet the criteria for achievement of CEUs.

SAMPLE CALCULATION:

8 hours = 480 minutes
480 minutes – 140 minutes of non-instructional time (lunch, breaks) = 340
Divide 340 minutes/60 minutes = 5.81
Multiply 5.81*.10 = .58
.58 round to the nearest 10th
Final CEU Award = .6

LEARNER SUPPORT

Need detailed information on courses?
Have a question about the certificate program requirements?
We are here to provide learner support services to assist you in achieving your professional development goals and objectives. Please contact us at education@agma.org to discuss your educational needs.
AGMA Education Department Mission and Certificate Programs

The education department continues to conduct programs that support the professional development of the gear manufacturing workforce that. Offering courses in face-to-face, online, and webinar formats, we strive to be a leader in gear education and training and embrace the expanded use of technology to reach our learners anytime, anywhere. We are committed to providing relevant, cutting edge, and challenging learning opportunities with an emphasis on learning outcomes and the application of knowledge to meet employer and learner needs.

Our Goals are to:
• Deliver training and education opportunities that build a knowledge-able, skilled workforce to more effectively and efficiently meet critical goals.
• Continually enhance the quality of the learning environment and the diversity of learning approaches to meet the needs of learners.
• Ensure that learning opportunities remain relevant.
• Continually assess and improve courses to assure desired learning outcomes are met.
• Attract, develop, and retain highly qualified, diverse instructors who are committed to our mission, who create a learning environment which is supportive and challenging, and who value service to others.

AGMA has established policies on:
• Student Record/Information Privacy
• Anti-Harassment/Discrimination
• Intellectual Property
• Proprietary Interest

For detailed information on such policies, please contact the Education Department at: education@agma.org.

AGMA Certificate Programs

A leader in Gear Education, AGMA continues to expand course offerings to meet the needs of the gear industry. Learners engage in professional development training by completing courses to earn the Advanced Gear Engineering Certificate and the Gear Manufacturing Certificate. It is quite an achievement and demonstrates a high level of commitment.

AGMA has expanded the certificate offerings to include the following:

**Advanced Gear Engineering Certificate**
Any combination of five advanced courses in face-to-face or live, instructor-led virtual formats

**Gear Manufacturing Certificate**
• Basic Training for Gear Manufacturing
• Fundamentals of Gear Design and Analysis
• Gear Manufacturing and Inspection
• Two additional advanced courses in face-to-face or live, instructor-led virtual formats

**Advanced Gear Engineering Certificate**
For International Industry Professionals (outside of North America)
• Three (3) Online Video Training Courses:
  – Detailed Gear Design
  – Gearbox CSI: Gears Only
  – Gear Failure Analysis
• Two (2) Additional Advanced Courses of your Choice
  Face-to-Face or Live, Instructor-Led Virtual Formats

More than 3,000 individuals have completed courses through the AGMA Education Department. For these dedicated individuals, taking the series of courses consists of more than 90 hours of classroom instruction. We are proud that our industry leaders are committed to assisting their employees in gaining valuable knowledge and insight to retain a qualified and skilled workforce by making these training opportunities available.
The development of AGMAs Workforce Education Series, Operator Level Courses, Online Video Training Courses: Detailed Gear Design, Gear Failure Analysis, Gearbox CSI, and the 2017 Webinar series are made possible through the generous support of the AGMA Foundation. Thank you for your continued support and partnership in educating the industry.

The AGMA Foundation also awards annual scholarships at the undergraduate and graduate school levels. In fact, 86% of the scholarship recipients have embarked on careers in gear manufacturing and design.

**Contact Cindy Bennett, Executive Director, at bennett@agma.org for more information and how you can participate in the annual campaign.**
AGMA offers custom on-site/in-house training! We understand that training can be costly to your bottom line but it still remains a necessary component for your company to remain on the cutting edge of gear knowledge in order implement best practices in your workplace.

**Benefits of On-Site Training**

**Cost Savings**
Again, you are cost-conscious – so are we! By bringing an AGMA course to your location, you can eliminate the cost of sending your staff to another location. Your organization will:
- Eliminate travel costs
- Maximize employee training time
- Increase the productivity of your most valuable asset
- Boost your employee retention program
- Reduce turnover

**Convenience**
- Choose the best time to learn based on your employees’ workloads and schedules
- Benefit from courses that fit your needs
- Training in your facility or shop

**Relevance**
- Tailor the courses to incorporate examples and content specific to your company’s needs and challenges.

**Succession Planning**
- Reduce the impact of the knowledge gap as new hires start and seasoned workers retire
- Increase cross-training activities to enhance and diversify the skills of your workforce

**Privacy**
Having training at your own facility keeps your training needs and proprietary interests private. This allows your team with the ability to speak as freely as needed.

**Accredited**
AGMA is accredited by the International Accreditors for Continuing Education and Training (IACET). AGMA complies with the ANSI/IACET Standard, which is recognized internationally as a standard of excellence in instructional practices. As a result of this accreditation, AGMA is accredited to issue the IACET CEU.

**Scheduling Your On-site Training**
1. Determine which course you would like delivered to your employees based on your organization’s priorities, challenges, and what your employees need to know.
2. Request a quote by contacting Rosemarie Bundoc, Education Manager, education@AGMA.org.
3. Schedule your custom training program.
4. Participate in a planning and implementation conference call with the AGMA Education team.
5. Prepare for Training Day.

**Ready to bring industry-leading gear education to your workplace?**

**Contact us today at 703-684-0211 or Education@AGMA.org!**
Online Education Offerings

Can’t make a live session? We bring the experts to you!

Online learning proves to be a great alternative to attending a face-to-face course. It is cost-effective and allows you to work at your own pace - anytime and anywhere. Learn the basics of the gear industry through the Online Workforce Education series and other advanced topics through the Online Video Trainings, Live Instructor-led courses and Webinars.

Pre-recorded and archived material is made available through AGMA’s Learning Management System at learning.agma.org. Live, instructor-led courses on various topics are periodically added to the 2021 Course Offerings page. Make sure to visit https://www.agma.org/education/advanced-courses/.

Visit https://www.agma.org/education/online

Online On-Demand Video Training Courses

**Detailed Gear Design: Beyond Simple Factors**

Member Fee: $1,095 | Non-member Fee: $1,595

Students can get the full experience of the course through more than 15 hours of video and supporting training documents. Learn about gear design and examine carefully crafted “problems” that will demonstrate the practical application of the optimization methods presented in this seminar. Facilitator: Raymond Drago, P.E. of Drive Systems Technology, Inc.

**Gear Failure Analysis**

Member Fee: $995 | Non-member Fee: $1,495

Students get the experience of the course through 10 hours of in-depth discussion of gear failure modes and supporting training documents. Learn the causes of gear failure and how to prevent it from occurring. You will also examine the various types of gear failure, such as overload, bending fatigue, Hertzian fatigue, wear, scuffing and cracking. Possible causes of these failures will be presented, along with some suggested ways to avoid them. Facilitator: Robert Erichello, P.E., of GEARTECH
American Gear Manufacturers Association – Where Real World Education Meets Real World Application!

Gearbox CSI: Gears Only
Member Fee: $795 | Non-member Fee: $1,295
This webinar focuses on the gear part of the Forensic Analysis of Bearings and Gear course. It helps gear designers gain a better understanding of various types of gears. This is a four-part series where you will learn about properly applying the best gear-bearing combination to any gearbox, simple or complex.

Basics of Gearing
Member Fee: $795 | Non-member Fee: $995
This course provides a solid and fundamental understanding of gear geometry, types and arrangements, and design principles. Starting with the basic definitions of gears, conjugate motion, and the Laws of Gearing, those attending will be given the tools needed to understand the interrelation and coordinated motion operating within gear pairs and multi-gear trains. Basic gear system design process and gear measurement and inspection techniques will also be explained. In addition, the fundamentals of understanding the step-wise process of working through the iterative design process required to generate a gear pair will be reviewed, and attendees will also briefly discuss the steps and issues involved in design refinement and some manufacturing considerations. Also, an explanation of basic gear measurement techniques, how measurement equipment and test machines implement these techniques, and how to interpret the results from these basic measurements will be covered.

Workforce Training Series
FREE for AGMA Members | Non-member Fee: $395/course
This series, free for AGMA members, provides a comprehensive overview of gearing to enhance students’ understanding of essential terminology and practices within the industry.

Fundamentals of Gearing
This course is a comprehensive overview of the industry. It begins with a little history of gearing and proceeds through the topics of parallel axis gear basics; involute tooth form; description of the gear; diametrical pitch/module; pitch; and pressure angle.

Parallel Gear Inspection
The gear inspection module includes basic concepts for gear measurement, the tools and instruments used, the evaluation of gear characteristics, definitions of terms, and introduction to gear classification.

Hobbing
This course is designed to present the basics of hobbing to hobbing machine operators, gear technicians, and engineers.

Archived Webinars
FREE for AGMA Members | Non-member Fee: $195/course
Live Webinars
Webinars are broadcast over the internet and sound is available either through your device speakers or audio on your phone. A toll-free number will be provided for each event. The log-in information is sent out several days prior to the event. Testing of your computer connection prior to the event is suggested and instructions will be provided with the login information. Free technical support is available.

For Previously Recorded Webinars
All sessions are recorded and sessions and handouts are available as on demand downloads.

NEW live, online education opportunities are added to the AGMA website periodically on various gear and power transmission related topics
Receive instruction in real-time and get those burning questions answered. Class sizes are limited to enable as much conversation and instructor/student interaction as possible. Make sure to check out the AGMA website for new online programs!

Visit visit https://www.agma.org/education/advanced-courses/
Basic Gear Inspection for Operators

1.3 CEUs
August 10-11, 2021
Chicago, IL

Instructors: William ‘Mark’ McVea, PhD., P.E.

Fees:
$995 First registrant per member company | $795 additional registrant
$1,495 First registrant non-member company | $1,295 additional registrant

This course will provide a solid foundation for anyone going into gear inspection. Learn the common, current and basics of the tools and techniques used to measure and inspect gears. Understand the four main categories by which a gear is evaluated and classified. Gain proficiency in understanding gear quality by learning the numerical scale on which gear design, manufacture and inspection are based, and more.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Learning Objectives:
- Describe the differences between measurement and inspection
- Thorough review of measurement techniques
- Thorough review of inspection results
- Use Means and methods to interpret and use the outcomes of both measurements and inspection to guide better gear production
- Describe of manufacturing and process cause and effect as defined by the results of gear inspection
- Explain the correlation between manual measurement techniques and how automated GMM (Gear Measurement Machine systems) perform the same task
- Be able to explain the automated processes used by GMM systems to assess gear quality
- Review of applicable standards

Operator Hobbing and Shaper Cutting

1.3 CEUs
October 13-14, 2021
Chicago, IL

Instructor: Peter Grossi

Fees:
$995 First registrant per member company | $795 additional registrant
$1,495 First registrant non-member company | $1,295 additional registrant

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.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Learning Objectives:
- Identify gear blank inaccuracies.
- Establish proper machine set-up procedures / practices.
- Define gear tooth element nomenclature.
- Identify gear tooth errors resulting from hobber / shaper machine set-up errors., as well as cutter sharpening errors.
- Interpret gear inspection charts for quality level.
Instructors: Terrance Klaves

Fees:
$995 First registrant per member company | $795 additional registrant
$1,495 First registrant non-member company | $1,295 additional registrant

Explore gear grinding processes, machine kinematics and setup, pitfalls, failures and expectations related to finish ground gearing. Learn definitions of gearing component features, process steps from blanking, through heat treatment to finished part ready to ship. Study aspects of Quality Assurance, Inspection Documentation and corrective actions for measured non-conformances. Understand preheat treat, heat treatment and post heat treatment operations including the how’s and why’s to produce finished gears that conform and perform to end user expectations.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Learning Objectives:
- Review and challenge control of part datums for pre-heat treatment operations, use datum’s consistently through finishing operations given part prints
- Anticipate and correct for part distortion during heat treatment knowing the actual heat treatment process used.
- Understand gear grinding kinematics for both form and generating machines along with allowable metal removal rates and wheel dressing intervals based on type of grinding wheels being used
- Ask questions of gear designers and manufacturing engineers to acquire all information required to produce conforming finished gears
- Accurately apply and inspect pre-calculated micro-geometry modifications derived from complex contact analysis software

Instructor: William ‘Bill’ Andreski

Fees:
$995 First registrant per member company | $795 additional registrant
$1,495 First registrant non-member company | $1,295 additional registrant

This course provides the heat treat operator and operations team, the means to perform the heat treatment of steel gears in a manner that meets the AGMA and customer requirements in a safe and efficient manner. The course identifies the key requirements for proper processing. Sufficient metallurgical background is provided to allow the student to identify how this information relates to the required processing and properties of the gear.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Learning Objectives:
- Identify and locate the required information for material, process, and equipment for gear heat treatment
- Recognize how the various heat treatment processes apply to the relevant AGMA documents
- Perform preparation to product and equipment for heat treatment in an efficient and safe manner
- Operate and monitor heat treat equipment, and perform quality control processes
- Perform post-heat treatment processes, Go/No-Go material inspections and cycle documentation reviews
Basic Training for Gear Manufacturing

2.7 CEUs
April 19-23, 2021
September 20-24, 2021
Chicago, IL

Instructors: Dwight Smith, Allen Bird, and Peter Grossi

Fees:
$1,595 First registrant per member company | $1,395 additional registrant
$2,095 First registrant non-member company | $1,895 additional registrant

Learn the fundamentals of gear manufacturing in this hands-on course. Gain an understanding of gearing and nomenclature, principles of inspection, gear manufacturing methods, hobbing and shaping. Utilizing manual machines, develop a deeper breadth of perspective and understanding of the process and physics of making a gear as well as the ability to apply this knowledge in working with CNC equipment commonly in use.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Learning Objectives:
- Demonstrate understanding of the evolution, history, and function of gears
- Show and describe 14 gear tooth features
- Describe six typical gear characteristics that are measured
- Demonstrate knowledge of gauging vs. measurement
- Utilize and describe a variety of analysis methods
- Troubleshoot many of their own problems, because they fully understand the process

Fundamentals of Gear Design and Analysis

1.7 CEUs
July 20-22, 2021
St. Louis, MO

Instructor: William ‘Mark’ McVea, PhD., P.E.

Fees:
$1,595 First registrant per member company | $1,395 additional registrant
$2,095 First registrant non-member company | $1,895 additional registrant

Gain a solid and fundamental understanding of gear geometry, types and arrangements, and design principles. Starting with the basic definitions of gears, conjugate motion, and the Laws of Gearing, learn the tools needed to understand the inter-relation and coordinated motion operating within gear pairs and multi-gear trains. Basic gear system design process and gear measurement and inspection techniques will also be explained. In addition, the fundamentals of understanding the step-wise process of working through the iterative design process required to generate a gear pair will be reviewed. Learn the steps and issues involved in design refinement and some manufacturing considerations. An explanation of basic gear measurement techniques, how measurement equipment and test machines implement these techniques, and how to interpret the results from these basic measurements will also be covered.

This course is taught at Ranken Technical College. A shuttle bus is available each day to transport students to and from the hotel.

Learning Objectives:
- Develop a full appreciation for the meaning and correct use of gear nomenclature
- Describe conjugacy and its relationship to transmission error
- Appreciate and be able correctly select the basic geartrain arrangements as a function of application
- Be able to describe and discuss the external factors that effect a gear pair and/or a geartrain
- Describe how the applied torque manifests itself as a force on the surface of the tooth and further how this develops into stress within the body of the tooth
- Be able to describe and discuss the various common manufacturing techniques for gears
- Describe the measurement and inspection techniques used to qualify a gear
- Develop a high-level of appreciation for various gear failure modes and causes
Advanced Level Course Offerings

Gear Manufacturing & Inspection

2.0 CEUs
February 23-25, 2021
Online

Instructors: Raymond J. Drago, P.E.

Fees:
$1,425 First registrant per member company | $1,225 additional registrant
$1,795 First registrant non-member company | $1,595 additional registrant

While function and rating are important factors in a successful gear design, to be truly optimal and successful, the gear designer must also design the gears to be manufactured and inspected. In this course, therefore, we will address key factors in a wide variety of manufacturing and inspection processes to enable the gear designer to better design optimal gears considering both rating and the necessary manufacturing and inspection processes to produce the gears as designed. We will also help the designer to understand how to interpret inspection data so that they can ensure that the gears meet the design. To be clear, this is not a course in how to operate the various machines. Rather it addresses the design provisions that are required to allow the gears to be optimally manufactured and inspected. The learner will develop a broad understanding of the methods used to manufacture and inspect gears, as well as interpret how the resultant information can be applied and interpreted in the design process.

Learning Objectives:
- Identify methods of manufacturing external and internal spur, single and double helical, and bevel and worm gears
- Describe the methodology and underlying theory for basic manufacture and inspection of each
- Discuss the “features” associated with each manufacturing method with regard to their impact upon and their ability to refine, guide and optimize the design process
- Take two views of the same results: meeting a “specification” and determining acceptability for a specific application, and interpreting the inspection data for purposes other than simply determining accept/reject status
- Specify the data required to control both the manufacturing and inspection processes on an engineering drawing. This includes both the data to be defined and the presentation of the data on the engineering drawing
- Discuss the basics of a variety of destructive and nondestructive inspection tests, including their underlying theory, application techniques and, most importantly, interpretation of the resultant data
Explore gear failure analysis in this hands-on seminar where students not only see slides of failed gears but can hold and examine those same field samples close up. Use of a microscope to examine field samples.

This course is taught at Ranken Technical College. A shuttle bus is available each day to transport students to and from the hotel.

**Learning Objectives:**
- Identify the primary and secondary failure modes
- Use the proper nomenclature to describe the morphology of gear failure
- Understand common tools and methods used in gear failure analysis
- Diagnose the root causes of failure
- Prescribe remedies to prevent repeat failures
- Use the GEARTECH textbook and other provided resources for ongoing study of gear failure analysis
- Tailor failure analysis techniques for their specific requirements
There is a distinct difference between “designing” a gear and “optimizing” a gear design. In this course, we will address the optimization process via an understanding of those factors beyond basic banding and pitting ratings. Optimization may focus on load capacity, economy of production or minimization of overall gear system envelope. In this course we will learn how to improve gear designs via optimization and gain new insight into concepts presented through illustrations and demonstrations. Explore all factors that go into good gear design from life cycle, load, torque, tooth, optimization, and evaluating consequences.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Learning Objectives:
- Improve their gear designs
- Apply their understanding of gear rating theory and analysis methods
- Investigate differences in stress states among various surface durability failure modes
- Discuss time dependent and time independent failure modes related to tooth design
- Use computer generated graphics to examine mesh action and tooth interaction
- Discuss the concepts presented

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This course focuses the supporting elements of a gearbox that allow gears and bearings to do their jobs most efficiently. Learn about seals, lubrication, lubricants, housings, breathers, and other details that go into designing gearbox systems.

Learning Objectives:
- Understand types of housing construction, housing elements (covers, inspection ports, sump, mounting, etc.)
- Apply drawing practices for housings and related components
- Bearing mounting, retention and sealing
- Understandelection and role of gearbox accessories, such as breathers, filters, screens, sight gages, and other level indication devices
- Apply the appropriate lubricant selection
- Apply the lubricant to the rotating elements
- Describe the selection criteria concerning the basic lubricant chemistry. Since the best design is only as good as its implementation, drawing practices and tolerancing will also be addressed from the designers’ perspective.
- Learn about translating the general design from the design manual to the individual component drawings.
Lube & Wear Advanced Concepts

May 25-27, 2021
Chicago, IL

Instructors: Dr. Tim Ovaert, Vern Wedeven, Chuck Coe

Fees:
$1,500 per member company registrant
$1,800 per non-member company registrant

This course is designed for engineers and scientists in the rolling element bearing, gear, and power transmission industries who desire a more fundamental knowledge of component-relevant topics in the field of tribology. The science behind lubrication and wear continues to evolve. This course introduces attendees to important terminology; surface topography measurement, characterization, and application; the mechanics of surfaces in contact; the development of lubricant films; grease lubrication; and failure of rolling element bearings and mechanical components in motion. The purpose of this course is to bridge the gap between component design and component failure, as a result of relative motion between surfaces in contact.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Course participants will enhance understanding of:
- Basic terminology and introduction to tribology
- Regimes of lubrication
- 2-D and 3-D surface roughness and topographical characterization
- 2-D and 3-D contact mechanics
- Asperity contact models
- 2-D and 3-D elastohydrodynamic lubrication (EHL)
- Transient and micro-EHL
- Mixed lubrication
- Grease composition, formulation, and research
- Wear in EHL and mixed lubrication
- Bearing life and performance applications

Advanced Concepts of Bearing Technology

June 7-10, 2021
Chicago, IL

Instructor: Dan Snyder, Dr. Tim Ovaert, Harvey Nixon

Fees:
$2,150 per member company registrant
$2,450 per non-member company registrant

This course builds on the foundations of the essential course and challenges the experienced engineer in areas such as failure modes, friction & wear, fatigue life calculation methods and load distribution. This is an exceptional course for engineers with 2-3 years work experience in bearings or past attendees of the Essential Concepts of Bearing Technology.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Course participants will enhance understanding of:
- Bearing Macrogeometry: Internal Clearance, Free Contact Angle
- Load Contacts, Ball/Roller Loading: Static/Inertial
- Contact Stresses, Deflection, Surface & Subsurface Stresses
- Internal Load Distribution — Speed & Motion
- Concepts of Friction & Wear: Surface Topography
- Fundamentals of Fatigue Life Theory, Dynamic Capacity
- Contact Friction
- Bearing Friction & Reference Speed Ratings
- Permanent Deformations & Static Capacity
- Fatigue Life Prediction: Standards & Advanced Calculations
- Testing Methods & Statistical Test Data Analysis
- Lubricants & Rheology & EHL Calculations
- Shaft-Bearing Systems & Performance Analysis
- Determining Preload
Essential Concepts of Bearing Technology

August 3-5, 2021
Chicago, IL

Instructors: Dan Snyder, Dr. Tim Ovaert, Vern Wedeven

Fees:
$2,150 per member company registrant
$2,450 per non-member company registrant

This course will give you an overview of the bearing industry as well as basic bearing types and applications. Knowledge of the key players, bearing types and terminology will ensure that everyone has a basic knowledge of the industry upon arrival.

This course is specially designed for engineers and others with technical backgrounds that have limited exposure to bearings and need to adapt their technical training to bearings or seek an upgrade to their technical knowledge. The Essentials Course focuses on understanding basic tribology, bearing attributes and applications and explores the basic concepts around manufacturing methods, loads, lubrication and failure.

This course is taught at Daley College. A shuttle bus is available each day to transport students to and from the hotel.

Course participants will enhance understanding of:
- Rolling Bearing Types, Attributes, Typical Applications,
- Macrogometry & Industry Standards
- Bearing Loads & Applications: Static and Dynamic
- Mounting Arrangements, Held/Free, Methods
- Contact Stresses — Surface & Subsurface
- Bearing Load Sharing & Internal Loading
- Bearing Pre-Load
- Materials for Ball & Roller Bearings
- Concepts in Friction, Lubrication & Wear
- Ball & Roller Bearing Deflections & Stiffness
- Bearing Lubricants, EHL & Lubrication Methods
- Failure Modes in Rolling Bearings
- Bearing Life Standards & Calculation Methods

Gears and bearings are integral to one another and AGMA and ABMA are working together to bring the best content and programs to both organizations. For decades the two associations have worked together- from the Annual Meetings, to education programs and trade webinars, both memberships continue the partnership to demonstrate their strong commitment to delivering value at all levels. As a member, you receive member discounts on all programs that either AGMA or ABMA offers.

The American Bearing Manufacturers Association

Founded in 1917, the American Bearing Manufacturers Association (ABMA) has long and rich history, which includes aiding in the production of bearings in World War I and fighting counterfeit bearings around the world. ABMA provides leadership, advocacy and education on issues impacting the global bearing industry. ABMA’s members include manufacturers of bearings and finished components as well as suppliers to the bearing industry. Participants from member companies are CEOs and senior executives—the key decision-makers and the most successful and forward thinking leaders in the bearing industry. Engage with ABMA to gain access to membership opportunities, receive updates on industry news, attend courses, or become a key partner.