



# Course Offerings

# Copyright

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*GPAllied* is the most diverse reliability and operations consulting and services company in the world. Combined, our unrivaled technical expertise, solutions portfolio and global reach help you achieve rapid bottom-line improvement and sustained cultural change.

*GPAllied* diversity and expertise result from joining together firms with experts in Maintenance and Reliability, Operational Excellence, and Workforce Development. This winning team allows us to offer you expertise in the fields of Lean, Reliability Engineering, Six Sigma, Condition Monitoring, Change Management, Maintenance Planning and Scheduling, Workforce Development and Maintenance Craft Skills training. However, only *GPAllied* can offer you solutions that fully integrate these specialties.

To ensure that *GPAllied* provides you with latest thinking and proven best practices, we have attracted recognized experts to our team, benchmarked best-in-class operations and connected with thought leaders throughout the industry. Furthermore, we ensure that our project team members have technical expertise, as well as expertise as trainers and mentors through a rigorous qualification process and the establishment of work execution standards.

***GPAllied* has modeled their deliverables based on the following core beliefs:**

- The reason our clients are in business is to make money
- The first step to ensuring profitability is to have reliable “systems”
- The term “system” speaks to the combination of the people who operate the equipment, the processes they follow to operate the equipment and the equipment itself
- The definition of reliable is: the ability to perform a given task, at a stated rate, for a given period of time, under a given set of circumstances
- The organization must be motivated and prepared for any change to be sustainable
- Having successfully attained reliability, sustaining the improvements is paramount to on-going success
- Optimization is achieved through the use of a culture of continuous improvement
- Clients require a rapid return on investments

To that end, GPAllied offers you a complete suite of solutions in the following categories:

- Sustained Reliable Operations
- Reliable Capital Delivery
- Reliable Maintenance Execution

GPAllied prides itself on two (2) things: our passion for helping the client and the flexibility of delivery methods.

Our passion is driven by *the satisfaction of seeing our company help our customers build, utilize and realize the power of the Return on Asset Reliability (ROAR™).*

Our flexibility in delivery methods comes in any one of four (4) different ways. Each way specifically customized to meet the unique needs of the client. Those four (4) ways are:

### Training

GPAllied offers all of our deliverables as classes for the client who prefers to implement using their own people.

### Coaching

For the client who wants more than a training solution, but still prefers to implement using their own personnel, GPAllied offers a combination training/coaching package. The training class is augmented by a regimen of coaching and mentoring by our experienced consultants.

### Services

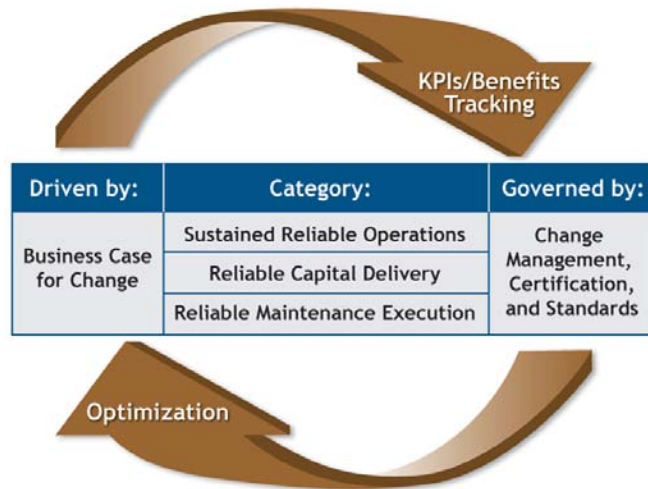
Some clients prefer to contract out certain functions. GPAllied can deliver our services to the client in one of two forms:

- Project Based – GPAllied personnel are on-site for the duration of the project
- Full Time Equivalent (FTE) – GPAllied personnel are on-site, full time as contracted employees

### Consulting

Whether you are starting a major change initiative or looking for the best way to improve performance, GPAllied's consultants guide you as you set your direction, design and deploy your approach, and realize results.

The GPAllied vision is to be the premier global provider of sustainable transformation driving improved customer operational and reliability excellence. To that end, we believe the best way to make our vision a reality is to optimize customer business performance through customized solutions utilizing our experienced people, innovative processes, and proven technologies.



Thus achieving operational and reliability excellence sustained through the use of cultural change management with the relentless pursuit to deliver the highest return on investment.

GP*Allied's* expert team provides unparalleled solutions. You can count on us to provide the following:

- A strong foundation to ensure that your organization's systems reliably meet customer needs with lower cost
- A roadmap to build upon that foundation to streamline your processes and help you achieve a culture of sustained continuous improvement
- Effective training to develop your people
- Consultants and trainers with technical expertise, interpersonal skills, and drive to work effectively with your team
- Solutions customized to fit your needs, drawing from a diverse range of methods and services
- A rapid return on your investment

### Training Classes

At GP*Allied*, we understand that you are not interested in "training for training's sake". You need hard-hitting, impactful training that addresses the specific need of your employees, delivers value for your training dollars, and produces bottom-line results.

That's what we deliver.

In today's increasingly competitive business environment, your training investment only makes sense if it yields a tangible improvement in KPI's like:

- Production efficiency
- Employee retention
- Labor costs
- Asset downtime
- Safety
- Quality control

With over 200 courses that can be easily customized to your equipment and processes, we are the one-stop shop for all of your technical and change management training needs. We offer these classes on-site at your facilities, for your employees; or periodically around the world on an open-enrollment basis.

When you select us for your training, you receive:

- Training from practitioners and implementers who are also skilled trainers.
- Courses designed with your learning objectives in mind using professional instructional system design combined with our subject-matter expertise.

You can obtain most of the courses in a format that works best for you:

- **Off the Shelf**— you can select our standard training if a generic course suits your needs.
- **Customized** — you can ask us to make minor modifications to better fit your organization's existing terminology and culture (which we can do quickly and cost-effectively), or you can ask us to develop a truly custom curriculum.

- **Public Courses** — you may decide to attend one of our expanding list of publicly offered courses, including those offered through Macomb Community College Workforce Development Institute in Warren, MI.
- **e-Learning** — for certain courses; you can select e-Learning, or a blended solution of e-Learning, instructor-led training, and coaching.

# Bearings & Lubrication

## DESCRIPTION

This course provides information on the concepts associated with bearings, bearing function, bearing design, bearing maintenance, installation and removal, expected load and wear patterns, bearing faults, and lubrication. There are hands-on exercises for bearing removal and installation. **Note:** This course is an abbreviated combination of MTM-14 Lubrication, and MTM-15 Bearings. Upon completion of this course, the participants will be able to explain the function, design, and construction of bearings; install, remove and maintain bearings; identify causes of bearing failure, able to explain the function of lubricants, and the proper methods for greasing bearings.

## RECOMMENDED AUDIENCE

This course is designed for electrical maintenance technicians.

## BEARINGS - YOU WILL LEARN:

- Discuss the basic concepts behind forces and stress.
- Discuss some of the basic terms used to describe and understand bearing design.
- Describe some of the materials used in the construction of bearings and why they are used.
- State the basic requirements of any bearing.
- Describe the differences between radial and thrust bearings.
- Describe the types of lubrication systems used for anti-friction and friction bearings.
- State the importance of and describe how to perform a soft foot check.
- State the procedure for performing various clearance checks on anti-friction and friction bearings.
- State the reasons for interference fits.
- Describe the various methods of heating bearings.
- Describe the various methods of cold mounting roller bearings.
- Describe the various methods of mounting tapered bore bearings.
- Explain the purpose of pre-load.
- Describe the methods of setting tapered roller bearings.
- State the differences and purposes of fixed and float bearings.
- Describe the various methods of roller bearing removal.
- State the importance of crush and torque on a journal bearing.
- Describe the various expected load and wear patterns of bearings that have been operating.
- Identify the various types of failures that occur in bearings.
- Describe the various types of failures that occur in bearings.
- Describe methods for reducing the various bearing failures.

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## LUBRICATION - YOU WILL LEARN:

- Discuss the origin of oil and its chemical make up.
- Discuss the basic principles of lubrication.
- Describe a basic lubricant and be familiar with the make-up of lubricants.
- Explain viscosity and use of viscosity terms.
- Differentiate between sliding and rolling friction.
- Discuss boundary/thin film lubrication.
- Discuss the origin of grease and its chemical make-up.
- Discuss various lubricant contaminants.
- Discuss lubrication of gears.
- Discuss the use of extreme pressure (EP) oils vs. non-EP oils.
- Be familiar with various methods of supplying gears with lubrication.
- Describe various causes of gear failure.
- Discuss the lubrication of worm gears, couplings, and bearings.
- Be familiar with the proper methods for greasing bearings.

## CLASS DURATION

16 hours