



# Course Offerings

# Copyright

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To obtain permission, please contact:

**GP*Allied*, LLC.**

4360 Corporate Rd, Suite 110

Charleston, SC 29405

[www.gpallied.com](http://www.gpallied.com)

888-335-8276



*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

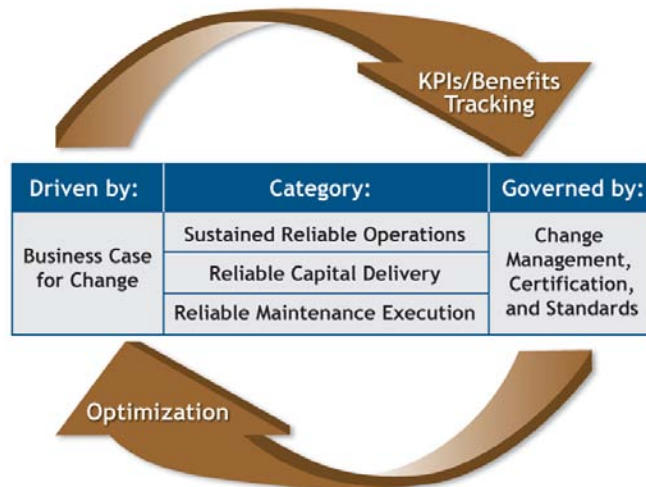
Some clients prefer to contract out certain functions. GPAllied can deliver our services to the client in one of two forms:

- 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.

# Industrial Electricity and Electronics for Mechanics

## DESCRIPTION

This course provides information on basic electricity and electronic concepts and devices. There are hands-on exercises for component and circuit operation. Upon completion of this course, the participants will be able to identify electrical and electronic components and explain the operation of these components, and the operation of simple circuits.

## RECOMMENDED AUDIENCE

This course is recommended for mechanical maintenance technicians.

## YOU WILL LEARN:

- Describe the structure of an atom.
- Tell the difference between a compound and an element.
- Explain how electrical forces cause objects to attract or repel other objects.
- Describe electron flow.
- State the definition of a cell.
- Explain the difference between a conductor and an insulator.
- State the definition of grounding.
- List the common causes of static electricity in an industrial plant.
- State the definition of bonding.
- List the main methods of producing potential difference.
- State the main difference between a primary cell and a secondary cell.
- Explain how to connect cells in parallel and in series.
- Describe how a photoelectric device works.
- Identify potential hazards when recharging batteries.
- State the most basic law of magnetic force.
- Describe how magnetic force operates.
- Describe the left-hand rule for magnetic field direction.
- Describe an electromagnet.
- Explain how to use lifting magnets, magnetic pulleys, and magnetic clocks.
- State the characteristics of an electrical conductor and an electrical insulator.
- State the definition of electric current.
- Explain the relationship of potential difference to the flow of electric current.
- State the definition of Ohm's Law.
- Identify the purpose and parts of an ammeter.
- Identify symbols for resistors, capacitors, and relays in an electric circuit diagram.
- Explain the operating principles of resistors, capacitors, and inductors.
- State the meaning of each band in the resistor color-code system.
- List the factors to consider when choosing a resistor.

- Explain how to connect capacitors in parallel and in series.
- State the difference between ac and dc.
- Solve for R, E, I, and P in a simple electrical problem.
- Solve for potential difference, current, and resistance in a series and parallel circuit.
- Describe the operation of a transformer
- Explain the difference between the primary winding and the secondary winding in a transformer.
- Explain the importance of the transformer in ac electricity.
- Explain what a complete cycle of ac consists of and how it is produced.
- State the definition of ac inductance.
- List the ways inductive reactance differs from resistance.
- Explain the difference between the terms in-phase and out-of-phase in an ac circuit.
- List the main advantages of the three-phase AC system.
- Explain the difference between system grounding and equipment grounding.
- List the objectives of system grounding.
- Name the parts of a vacuum tube, and describe the function of each part.
- Explain the difference between p-type semiconductor materials and n-type semiconductor material.
- List the parts of a transistor.
- State the definition of an integrated circuit.
- Name each of the blocks of the block diagram of a programmable logic controller system.
- Explain how each of the blocks functions with the system as a whole.
- Describe the relationship of the programmable logic controller system to the real world.
- Explain the basic concepts of ladder logic software.
- Describe the relationship of an input device to an input point on an input module.
- Identify the symbols for common input and output devices.

## CLASS DURATION

40 hours