



Advanced Leadership for Engineers

An Online Continuing Education Course for Engineers

Course Number: BS-4014

Credit: 4 Hours / 4 PDH / 4 CPD

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Introduction

Most engineers go throughout their careers with their heads down, seldom looking at the horizon or even peering over the fence. Their immediate objectives are to perform the tasks at hand, regardless of the situations that they face or the environments in which they labor. While this is noble and most managers could never find fault with this attitude for the short term, the great majority of engineers have well above average intelligence and are capable of much more than what they are currently doing.

In this course, you will learn about the qualities of leadership and the techniques and aptitude required to develop these qualities for both the short term and the long term. In addition, we will familiarize the engineer with the management skills to rise up through the ranks of the management ladder, utilizing these skills not only within your internal organization but also applying them in a marketing and customer environment that will enhance your opportunities for growth and promotion.

The course is divided into two separate parts, each of which is intended to improve the capabilities of an engineer in the overall business community. The first part describes the steps necessary to become a top-quality leader and discusses the principles, strategies, and education necessary to be considered for a higher leadership role. The second part of this course deals with the actual fundamentals of managing, whether it's a small team or a department, or even a large organization. The course describes in detail the ways that an individual might be considered for a more important position, and how an engineer should take advantage of training and experience opportunities that become available while maintaining a conscientious effort toward self-improvement.

You will be made aware of how to develop skills that will enable every member of your organization, large or small, to perform at an optimum level. Examples are given of solutions to problems that are encountered as your new assignment unfolds. You will also learn how to develop and utilize core principles to recognize problems or difficult situations, as well as the skill set to resolve them through training and experience. As you will discover by reading and studying this course, having personal discipline is very important to an engineer who aspires to management level. Keep in mind that this course is only a recommendation for what you will need to do to be successful.

Course Outline

A. Maximizing Leadership Skills

1. Converting Your Capabilities into Abilities
 - a. Strive for Perfection, Achieve Excellence
 - b. Education (Requirements & Preferences)
 - c. Training and Experience
2. Leadership
 - a. Significant Inherent Qualities
 - b. Acquired Techniques
3. Communications Techniques
 - a. With Subordinates and Peers
 - b. With Other Leaders & Supervisors
 - c. With Executive Management

B. Maximizing Management Skills

1. Understanding Company Responsibilities and Goals
2. Team Building
 - a. Knowing Your Organization
 - b. Making Quality Assignments
 - c. Communicating Your Objectives and Goals
3. Motivational Skills
 - a. Creating Teamwork
 - b. Resolving Organizational & Personal Issues
4. Going Beyond Company Requirements

A. Maximizing Leadership Skills

1. Converting Your Capabilities into Abilities

a. Strive for Perfection, Achieve Excellence

There has probably never been a perfect engineer, and in spite of all your training and experience, your chances of becoming the first engineer to be perfect or to manage any organization perfectly are very remote. There was a great football coach more than fifty years ago who told his professional team to "...strive for perfection every day. You will never become perfect, but you will achieve a standard of excellence." He instilled this thought in his players so often that they came to believe his words. And they did achieve excellence, five times over an eight-year period.

In case you hadn't heard this story before, the coach was Vince Lombardi, and the players that he was talking to were the Green Bay Packers of the National Football League. In 1958, the year before Mr. Lombardi arrived in Green Bay, the Packers had won one game and had lost eleven, and were about to lose their franchise. Mr. Lombardi had come up through the ranks, having coached at the high school level, then spending several years as a college coach at Army and

Fordham when they were prominent collegiate football powers. Mr. Lombardi landed in New York in 1954 as the offensive coordinator for the New York Football Giants. During the next several years, the Giants achieved a measure of success that was unprecedented in their previous nearly four decades of team history. After their thrilling overtime loss to the Baltimore Colts in the 1958 NFL Championship game, a football game that was universally televised for the first time, Mr. Lombardi felt that he was ready for a new challenge. He had worked hard to become one of the brightest and most ingenious football coaches in the sport. His immediate attention was to become head coach of the Giants, but that position was well represented, and the Mara family (the Owners) were not about to make that kind of offer to Mr. Lombardi. He was also interested in a head coaching position at one of the major universities, such as Notre Dame, but believed that he was being discriminated against because of his Italian-American heritage.

Nevertheless, the Green Bay Packer franchise offered Mr. Lombardi the head coaching position, possibly out of desperation, in February of 1959. Although Mr. Lombardi was reluctant at first to go to Green Bay, he accepted the offer as kind of a stepping stone to better things in the future. In that first year under Head Coach and General Manager Vince Lombardi, the Packers won seven games while losing only five. During that first year Mr. Lombardi, recognizing that a winning team must have on-the-field leadership as well as sideline coaching and tutoring, named quarterback Lamar McHan as his offensive leader. He also was wise enough to make a trade with the New York Giants for Emlen Tunnell, a defensive back who was later inducted into the NFL Hall of Fame, as the leader of the defense. However, when Mr. McHan was injured in midseason, Mr. Lombardi turned to a little known quarterback named Bart Starr, who had impressed Mr. Lombardi with his leadership skills, and inserted him into the starting lineup. Mr. Starr, who had been a 17th round draft choice and had been with the Packers for three previous years without ever starting or winning one game, led the Packers to four straight wins at the end of the season. Mr. Starr became the natural leader of the offense for the next decade, and Mr. Lombardi was named NFL Coach of the Year by the football writers.

The following year the Packers were the Western Conference champions and barely lost to the Philadelphia Eagles in the NFL championship game. In 1961, the Packers won the National Football League Championship and then went on to win four more NFL Championships, including the first two Super Bowls, in the next five years. Mr. Starr was named the Most Valuable Player in Super Bowls I and II. Mr. Starr, along with several of his teammates from that one-win team from 1958, is now in the NFL Hall of Fame. And all that Mr. Lombardi, who is also in the NFL Hall of Fame, received for accepting a job that he didn't particularly want, was to have the Super Bowl trophy named in his honor.

If you analyze the above situation, you might make the case that Vince Lombardi was arguably the greatest professional football coach of all time. As a coach, he had a love of the game as well as a knowledge of the way that the game should be played that was unparalleled. Although he had become a great coach due to his study and knowledge of the game, some of his leadership qualities may not have been conventional. He led through his dedication, his knowledge of the game, and possibly through intimidation, a leadership characteristic that might not be considered appropriate to some. However, he undoubtedly had the wisdom to hire some of the best assistant coaches of his day, who had the same dedication and characteristics as Mr. Lombardi. These individuals likely studied the game of professional football and were able to explain to the players the techniques necessary to be the best that they could be. And he chose players who, in

his expert opinion had the potential to become the leaders as well as the mentors of their teammates. By the time that he retired in 1967, Vince Lombardi had done something that no football coach before or since has done.

The correlation between coaching a football game and leading or managing an organization is similar in many respects. The Owner/General Manager/Head Coach represents the Company/Executive Management/Supervisor that provides you with the stadium and the uniforms to play in, the pads and helmets to protect you, and the finances to see you through to completion of the game and the season. You can become the leader, the equivalent of the quarterback, whether you were the 1st or 17th round draft choice. You may not have even been the first choice of the Head Coach to lead the team. You may have experienced some success or failure at another level, but now you are being asked to call the plays and lead your team to victory in the big leagues. Even though you have been given a "game plan" by your Supervisor, you will have to overcome setbacks and use your options (ingenuity) to achieve victory (success). You may not win the Super Bowl or even every game that you play, but every engineer should have the confidence that your efforts and the performance of your team will end in a victory.

There are multiple lessons that an engineer can derive from the above ways in which Coach Lombardi was able to achieve excellence:

1. The Green Bay Packers were the champions, and the trophies belonged to the team, although Mr. Lombardi received numerous honors along the way. The ultimate excellence, however, rested with the overall team performances.
2. Mr. Lombardi seized at the opportunity to become the coach of the Green Bay Packers when the offer was made, even though it was not necessarily his first choice. Engineers don't always have the opportunity to go where they would prefer or to do the exact thing that they believe would benefit them the most. However, they always have the opportunity to excel in whatever choice they make or in whatever position they are placed.
3. There are rarely any discrimination barriers if you achieve excellence in your job or for your team. If you sense that there are, your first objective is to strive to overcome them with the strongest effort that you can manifest. When the success of this effort does not produce the expected results, you should then consider looking elsewhere.

b. Education (Requirements and Preferences)

As we stated in the Introduction, the great majority of personnel in the engineering field have well above average intelligence and are likely capable of much more than what they are currently producing. Having a college degree is certainly beneficial to enhancing your abilities or to seeking and acquiring a promotion. Depending on the type of activity in which you become involved and the overall responsibility that you are given, a specific college degree may or may not be a requirement. Not having a degree in this era, even a two-year associate's degree, may hinder your prospects for multiple future advancements within some companies. Whether the degree is in engineering, engineering technology, one of the sciences, or even a non-science degree such as business management is not so important. This is particularly true if you are

considering any advancement as a primary stepping stone within your company or simply as a potential highlight on your resume.

Regardless of your formal education, Bachelor of Science, or a master's degree or an engineering technology certificate or just a high school education with some apprenticeship education, you should be serious about being the best that you can be. While you may not be under any serious obligation to master your profession, converting your capabilities, which are your potential achievements, into certain abilities that will bring you notice is extremely important to your future. This concept is applicable irrespective of which field of endeavor you have chosen: Civil, Chemical, Mechanical, Electrical, Computer Science, or something else. Possibly, you have come to the conclusion that an engineer must have one of those major engineering degrees in order to be considered for a higher position in your company or even to function successfully in your chosen field. As you gain in wisdom and maturity and your experience broadens, you may come to realize that you would prefer to specialize in one of the many satellite areas within the primary domain of your field of study:

For instance, piping design under the umbrella of mechanical engineering has become a very specialized and distinctive entity which may include such auxiliary fields as pneumatics (compressed air, instrument air, etc.), hydraulics (lubricants and synthetic fluids, pumps, cylinders, drives and the like), and many variations of these two categories. While becoming familiar and very knowledgeable in these areas will aid in establishing your ability to support and guide others in the future, you obviously run the risk of being too much of an expert in any one of these areas. The more diversified that you are while not becoming indispensable in any given area, the greater will be your opportunity to extend your growth as a supervisor or manager, and the higher the likelihood that this expertise will propel you to the next level in your organization.

Another in-demand field is electrical engineering; electrical engineering can be sub-divided into several categories, including power generation, visible and solid-state motor controls, telecommunications, electronics—where microchips operate everything from televisions and satellites to automobiles and airplanes—and especially computer sciences. Items that are "state-of-the-art" this year are practically obsolete one year later. Today's technology lists wireless and remote control devices of every variety, automobiles that potentially, if not actually, drive themselves, and a treasure-trove of automatic devices that weren't even on the radar twenty years ago. The more versatile that you become, whether in your preferred discipline or even in another field of science altogether, the more valuable you are to the company at present. Furthermore, this flexibility will prove to yourself that you are progressing toward a higher position, whether in your current organization or even outside your current company.

In addition to a formal education in engineering or computer science or some other technical field, many engineers today acknowledge that secondary education in business and/or finance is equally as important as engineering and technology in becoming a valuable asset to the company. Whether or not you have a degree in industrial management or business administration, your value to the company will become abundantly clear as you process the many cost factors involved with your specific work. Your ability to weigh the costs and expenses versus the timelines and calendar challenges for the work in which you are involved is a

significant aspect of your responsibilities. This financial understanding will give you the wherewithal to make decisions in a timely manner that will enhance your status in the organization, and will likely give you an edge over some other organization members in your field or discipline. This additional knowledge will also place you in a more favorable light with your supervisors as well as others such as Project Managers, suppliers, and contractors who would appreciate your technical abilities and have become familiar with the activities in which you are involved.

c. Training and Experience

Many companies today will give their engineers and designers, and even their draftspersons the opportunity, especially early in their careers, to advance their education. You might also be offered the opportunity to attend specific training sessions such as seminars, expositions, or occasionally even a full-scale program, which the company expects will benefit the employee, and ultimately the employer. The diversity of the people attending these programs, as well as the many types of companies, institutions, and organizations that they represent, can prove to be very beneficial, especially if you consider yourself to be a "manager-in-training." Furthermore, some valuable engineering concepts will usually be presented, and every attendee maybe asked to participate in the program discussions. While there seldom seems to be a major effort to explain how you should manage an organization, there is often a concerted effort to prepare you to manage yourselves in your current positions. Keep in mind that the company has probably hired you because it believed that you were an investment and that your growth within the company would provide them with an appreciable dividend over time.

However, unless you exchange this potential capability for... abilities, both your talents as well as the company's investment in... the company's attitude is generally that leadership... able people. As you and your company will... must be practiced in order for them to become... a potential leader's mind that you will achieve... position through the acclaim of others by... nted to that position by a supervisor. In the latte... that just being put in charge certainly does...

In developing your leadership... able experience, four of the most valuable conc... ler, and that will stay with you throughout yo...

- a. Keep acc...
- b. Maximiz...
- c. Seek form...
- d. Maintain...

One of the main principles... ent discovered this fact already, is that your supervisors are not p... interested in your capabilities, but rather in your performance and abilities. As we noted above, you are a human commodity whose realized

