

"THE UNWRITTEN LAWS OF ENGINEERING"

The following text is reprinted with permission from "The Unwritten Laws of Engineering" by W.J. King, originally appearing in the May, June, and July 1944 issues of Mechanical Engineering. That the article has been reprinted several times during the last 36 years should bear witness to its usefulness. It offers much wisdom to young engineers starting their careers, and to older engineers who know these things perfectly well but who all too often fail to apply them in practice.

IN RELATION TO YOUR WORK

However menial and trivial your early assignments may appear give them your best efforts.

Many young engineers feel that the minor chores of a technical project are beneath their dignity and un-worthy of their college training. They expect to prove their true worth in some major enterprise. Actually, the spirit and effectiveness with which you tackle your first humble tasks will very likely be carefully watched and may affect your entire career.

Occasionally you will worry unduly about where your job is going to get you -whether it is sufficiently strategic or significant. Of course these are pertinent considerations and you would do well to take stock of them, but by and large it is fundamentally true that if you take care of your present job well, the future will take care of itself. This is particularly so in the case of a large corporation, where executives are constantly searching for competent people to move up into more responsible positions. Success depends so largely upon personality, native ability, and vigorous, intelligent prosecution of any job that it is no exaggeration to say that your ultimate chances are much better if you do a good job on some minor detail than if you do a mediocre job as section head. Furthermore, it is also true that if you do not at first make a good showing on your present job you are not likely to be given the opportunity of trying something else more to your liking.

There is always a premium upon the ability to get things done.

This is a quality which may be achieved by various means under different circumstances. Specific aspects will be elaborated in some of the succeeding items. It can probably be reduced, however, to a combination of three basic characteristics:

- (a) Energy, which is expressed in initiative to start things and aggressiveness to keep them moving briskly.
- (b) Resourcefulness or ingenuity, i.e., the faculty for finding ways to accomplish the desired result, and
- (c) Persistence (tenacity), which is the disposition to persevere in spite of difficulties, discouragement, or indifference.

This last quality is sometimes lacking in the make-up of brilliant engineers, to such an extent that their effectiveness is greatly reduced. Such dilettantes are known as "good starters but poor finishers." Or else it will be said of a man (or a woman): "You can't take him too seriously; he'll be all steamed up over an idea today but tomorrow he will have dropped it and started chasing some other rainbow." Bear in mind, therefore, that it may be worth while finishing a job, if it has

any merit, just for the sake of finishing it.

In carrying out a project, do not wait for managers, vendors, and others to deliver the goods; go after them and keep everlastingly after them.

This is one of the first things a new engineer has to learn in entering a manufacturing organization. Many novices assume that it is sufficient to place the order and sit back and wait until the goods are delivered. The fact is that most jobs move in direct proportion to the amount of follow-up and expediting that is applied to them. Expediting means planning, investigating, promoting, and facilitating every step of the process. Cultivate the habit of looking immediately for some way around each obstacle encountered, some other recourse or expedient to keep the job rolling without losing momentum. There are ten-to-one differences between individuals in respect to what it takes to stop their drive when they set out to get something done.

On the other hand, the matter is occasionally overdone by overzealous individuals who make themselves obnoxious and antagonize everyone by their offensive browbeating tactics. Be careful about demanding action from another department. Too much insistence and agitation may result in more damage to your personal interests than could ever result from the miscarriage of the technical point involved.

Confirm your instructions and the other person's commitment in writing.

Do not assume that the job will be done or bargain kept just because the other person agreed to it. Many people have poor memories, others are too busy, and almost everyone will take the matter a great deal more seriously if he or she sees it in writing. Of course there are exceptions, but at times it pays to mark a third party for a copy of the memo, as a witness.

When sent out on any complaint or other assignment, stick with it and see it through to a successful finish.

All too often a young engineer from the home office will leave a job half done or poorly done in order to catch a train or keep some other engagement. Wire the boss that you've got to stay over to clean up the job. Neither the boss nor the customer will like it if another person has to be sent out later to finish it up.

Avoid the very appearance of vacillation.

One of the gravest indictments of an engineer is to say: "His or her opinion at any time depends merely upon the last person with whom he or she has talked." Refrain from stating an opinion or promoting an undertaking until you have had a reasonable opportunity to obtain and study the facts. Thereafter see it through if at all possible, until fresh evidence makes it folly to persist. Obviously the extremes of bullheadedness and dogmatism should be avoided, but remember that reversed decisions will be held against you.

Don't be timid -speak up -express yourself and promote your ideas.

Every young engineer should read Emerson's essay on "Self Reliance." Too many new people seem to think that their job is simply to do what they're told to do, along the lines laid down by the boss. Of course there are times when it is very wise and prudent to keep your mouth shut, but, as a rule, it pays to express your point of view whenever you can contribute something. The quiet mousey individual who says nothing is usually credited with having nothing to say.

It frequently happens in any sort of undertaking that nobody is sure of just how the matter ought to be handled; it's a question of selecting some kind of program with a reasonable chance of success. This is commonly to be observed in engineering meetings. The first person to speak up with a definite and plausible proposal has better than an even chance of carrying the floor, provided only that the scheme is definite and plausible. (The "best" scheme usually cannot be recognized as such in advance.) It also happens that the person who talks most knowingly and confidently about the matter will very often end up with the assignment to carry out the project. If you do not want the job, keep your mouth shut and you'll be overlooked, but you'll also be overlooked when it comes time to assign larger responsibilities.

Before asking for approval of any major action, have a definite plan and program worked out to support it.

Executives very generally and very properly will refuse to approve any proposed undertaking that is not well planned and thought through as regards the practical details of its execution. Quite often a young person will propose a project without having worked out the means of accomplishing it, or weighing the actual advantages against the difficulties and costs. This is the difference between a "well-considered" and a "half-baked" scheme.

Strive for conciseness and clarity in oral and written reports.

If there is one bane of an executive's existence, it is the person who takes a half hour of rambling discourse to tell what could be said in a sentence of twenty words. There is a curious and widespread tendency among engineers to surround the answer to a simple question with so many preliminaries and commentaries that the answer itself can hardly be discerned. It is so difficult to get a direct answer out of some people that their usefulness is greatly diminished. The tendency is to explain the answer before answering the question. To be sure, very few questions admit of simple answers without qualifications, but the important thing is to state the crux of the matter as succinctly as possible first. On the other hand, there are times when it is very important to add the pertinent background or other relevant facts to illuminate a simple statement. The trick is to convey the maximum of significant information in the minimum time, a valuable asset to anyone.

An excellent guide in this respect may be found in the standard practice of newspapers in printing the news. The headlines give you 90% of the basic facts. If you have the time and interest to read further, the first paragraph will give you most of the important particulars. Succeeding paragraphs simply give details of progressively diminishing significance. To fit an article into available space, the editor simply lops off paragraphs at the rear end, knowing that relatively little of importance will be lost. You can hardly do better than to adopt this method in your own reports, presenting your facts in the order of importance, as if you might be cut off any minute.

Be extremely careful of the accuracy of your statements.

This seems almost trite, and yet many engineers lose the confidence of their superiors and associates by habitually guessing when they do not know the answer to a direct question. It is certainly important to be able to answer questions concerning your responsibilities, but a wrong

answer is worse than no answer. If you do not know, say so, but also say, "I'll find out right away." If you are not certain, indicate the exact degree of certainty or approximation upon which your answer is based. A reputation for dependability and reliability can be one of your most valuable assets.

This applies, of course, to written matter, calculations, etc., as well as to oral reports. It is definitely bad business to submit a report to the boss for approval without first carefully checking it yourself, and yet formal reports are sometimes turned in full of glaring errors and omissions.

IN RELATION TO THE BOSS

Every manager must know what's going on in his or her bailiwick.

This principle is so elementary and fundamental as to be axiomatic. It follows from the very obvious fact that a person cannot possibly manage his or her business successfully unless he or she knows what's going on in it. It applies to minor managers and other individuals charged with specific responsibilities as well as to department heads. No one in his or her right mind will deny the soundness of the principle and yet it is very commonly violated or overlooked. It is cited here because several of the rules which follow are concerned with specific violations of this cardinal requirement.

Do not overlook the fact that you're working for your boss.

This sounds simple enough, but some engineers never get it. By all means, you're working for society, the company, the department, your family, and yourself, but primarily you should be working for and through your boss. And your boss is your immediate superior, to whom you report directly. It is not uncommon for young engineers, in their impatient zeal to get things done, to ignore the boss, or attempt to go over or around the boss. Sometimes they move a little faster that way, for a while, but sooner or later they find that such tactics cannot be tolerated in a large organization. Generally speaking, you cannot get by the boss; he or she determines your rating and rates you on your ability to cooperate, among other things. Besides, most of us get more satisfaction out of our jobs when we're able to give the boss our personal loyalty, with the feeling that we're helping him or her to get the main job done.

Be as particular as you can in the selection of your boss.

In its effect upon your engineering career, this is second in importance only to the selection of proper parents. In most engineering organizations the influence of the senior engineer, or even the section head, is a major factor in molding the professional character of younger engineers. Long before the days of universities and textbooks, master craftsmen in all the arts absorbed their skills by apprenticeship to master craftsmen. It is very much as in the game of golf; a beginner who constantly plays in company with "duds" is very apt to remain a "dud," too, no matter how faithfully the rules are studied. Whereas even a few rounds with a "pro" will usually improve a novice's game.

But of course, it is not always possible to choose your boss advisedly. What if he or she turns out to be somewhat less than half the person he or she ought to be? There are only two proper

alternatives open to you; (a) accept the boss as a representative of a higher authority and execute his or her policies and directives as effectively as possible, or (b) transfer to some other outfit at the first opportunity. A great deal of mischief can be done to the interests of all concerned (including the company) if some other alternative is elected, particularly in the case of younger persons. Consider the damage to the efficiency of a military unit when the privates, disliking the leader, ignore or modify orders to suit their individual notions. To be sure, a business organization is not a military machine, but it is not a mob either.

One of the first things that you owe your boss is to keep him or her informed of all significant developments.

This is a corollary of the preceding rules: A manager must know what's going on. The main question is: How much must he or she know -how many of the details? This is always a difficult matter for the new engineer to get straight. Many novices hesitate to bother the boss with too many reports, and it is certainly true that it can be overdone in this direction, but in by far the majority of cases the executive's problem is to extract enough information to be kept adequately posted. For every time the boss has to say, "Don't bother me with so many details," there will be three times he or she will say, "Why doesn't someone tell me these things?" Bear in mind that the boss is constantly called upon to account for, defend, and explain your activities to the "higher-ups," as well as to coordinate these activities into a larger plan. In a nutshell, the rule is therefore to give him or her all the information needed for these two purposes.

Whatever the boss wants done takes top priority.

You may think you have more important things to do first, but unless you obtain permission it is usually unwise to put any other project ahead of a specific assignment from your own boss. As a rule, he or she has good reasons for wanting his or her job done now, and it is apt to have a great deal more bearing upon your rating than less conspicuous projects which may appear more urgent.

Also, make note of this: If you are instructed to do something and you subsequently decide it isn't worth doing (in view of the data or events) do not just let it die, but inform the boss of your intentions and reasons. Neglect of this point has caused trouble on more than one occasion.

Do not be too anxious to follow the boss's lead.

This is another side of the matter covered by the preceding rule. An undue subservience or deference to the department head's wishes is fairly common among young engineers. A person with this kind of psychology may:

- 1 Plague the boss incessantly for minute directions and approvals.
- 2 Surrender all initiative and depend upon the boss to do all of his or her basic thinking
- 3 Persist in carrying through a design or a program even after new evidence has proved the original plan to be wrong.

This is where an engineering organization differs from an army. In general, the program laid down by the department or section head is tentative, rather than sacred, and is intended to serve only until a better program is proposed and approved.

The rule therefore is to tell your boss what you have done, at reasonable intervals, and ask for approval of any well-considered and properly planned deviations or new projects that you may

have conceived.

REGARDING RELATIONS WITH ASSOCIATES AND OUTSIDERS

Never invade the domain of any other division without the knowledge and consent of the executive in charge.

In all transactions be careful to "deal in" everyone who has a right to be in.

It is extremely easy, in a large organization, to overlook the interests of some division or individual who does not happen to be represented, or in mind, when a significant step is taken. Very often the result is that the step has to be retracted or else considerable damage is done. Even when it does no apparent harm, most people do not like to be left out when they have a stake in the matter, and the effect upon morale may be serious.

Of course there will be times when you cannot wait to stand on ceremony and you'll have to go ahead and "damn the torpedoes." But you cannot do it with impunity too often.

Note particularly that in this and the preceding item the chief offense lies in the invasion of the other person's territory without his or her knowledge and consent. You may find it expedient on occasions to do the other person's job in order to get your own work done, but you should first give the other person a fair chance to deliver the goods or else agree to have you take over. If you must offend in this respect, at least you should realize that you are being offensive.

Be careful about whom you mark for copies of letters, memos, etc., when the interests of other departments are involved.

A lot of mischief has been caused by young people broadcasting memoranda containing damaging or embarrassing statements. Of course it is sometimes difficult for a novice to recognize the "dynamite" in such a document but, in general, it is apt to cause trouble if it steps too heavily upon someone's toes or reveals a serious shortcoming on anybody's part. If it has wide distribution or if it concerns manufacturing or customer difficulties, you'd better get the boss to approve it before it goes out unless you're very sure of your ground.

Promises, schedules, and estimates are necessary and important instruments in a well-ordered business. Many engineers fail to realize this, or habitually try to dodge the irksome responsibility for making commitments. You must make promises based upon your own estimates for the part of the job for which you are responsible, together with estimates obtained from contributing departments for their parts. No one should be allowed to avoid the issue by the old formula, "I can't give a promise because it depends upon so many uncertain factors." Consider the "uncertain factors" confronting a department head who must make up a budget for an entire engineering department for a year in advance! Even the most uncertain case can be narrowed down by first asking, "Will it be done in a matter of a few hours or a few months - a few days or a few weeks?" It usually turns out that it cannot be done in less than three weeks and surely will

not require more than five, in which case you'd better say four weeks. This allows one week for contingencies and sets you a reasonable bogie under the comfortable figure of five weeks. Both extremes are bad; a good engineer will set schedules which can be met by energetic effort at a pace commensurate with the significance of the job.

As a corollary of the following, you have a right to insist upon having estimates from responsible representatives of other departments. But in accepting promises, or statements of facts, it is frequently important to make sure you are dealing with a qualified representative of the other section. Also bear in mind that when you ignore or discount another person's promises you impugn his or her responsibility and incur the extra liability yourself. Of course this is sometimes necessary, but be sure that you do it advisedly. Ideally, another person's promises should be negotiable instruments, like a personal check, in compiling estimates.

When you are dissatisfied with the services of another section, make your complaint to the individual most directly responsible for the function involved. Complaints made to a person's superiors, over the person's head, engender strong resentments and should be resorted to only when direct appeal fails. In many cases such complaints are made without giving the person a fair chance to correct the grievance, or even before he or she is aware of any dissatisfaction.

This applies particularly to individuals with whom you are accustomed to dealing directly or at close range, or in cases where you know the person to whom the function has been assigned. It is more formal and in some instances possibly more correct to file a complaint with the head of the section or department, and it will no doubt tend to secure prompt results. But there are more than a few individuals who would never forgive you for complaining to their boss without giving them a fair chance to take care of the matter.

In dealing with customers and outsiders remember that you represent the company,

ostensibly with full responsibility and authority. You may be only a few months out of college but most outsiders will regard you as a legal, financial, and technical agent of your company in all transactions, so be careful of your commitments.

PURELY PERSONAL CONSIDERATIONS FOR ENGINEERS

About 99% of the emphasis in the training of engineers is placed upon purely technical or formal education. In recent years, however, there has been a rapidly growing appreciation of the importance of "human engineering," not only in respect to relations between management and employees but also as regards the personal effectiveness of the individual worker, technical or otherwise. It should be obvious enough that a highly trained technological expert with a good character and personality is necessarily a better engineer and a great deal more valuable to his or her company than a sociological freak or misfit with the same technical training. This is largely a consequence of the elementary fact that in a normal organization no individual can get very far in accomplishing any worthwhile objectives without the voluntary cooperation of his or her associates. And the quantity and quality of such cooperation is determined by the "personality factor" more than anything else.

This subject of personality and character is, of course, very broad and much has been written and preached about it from social, ethical, and religious points of view. The following "laws" are drawn from the purely practical point of view based upon well-established principles of good

engineering practice, or upon consistently repeated experience. As in the preceding sections, the selections are limited to rules which are frequently violated, with unfortunate results, however obvious or bromidic they may appear.

"LAWS" OF CHARACTER AND PERSONALITY

One of the most important personal traits is the ability to get along with all kinds of people. This is rather a comprehensive quality but it defines the prime requisite of personality in any type of industrial organization. No doubt this ability can be achieved by various formulas, although it is probably based mostly upon general, good-natured friendliness, together with fairly consistent observance of the "Gold- en Rule." The following "do's and don'ts" are more specific elements of such a formula:

Cultivate the tendency to appreciate the good qualities, rather than the shortcomings of each individual.

Do not give vent to impatience or annoyance on slight provocation. Some offensive individuals seem to develop a striking capacity for becoming annoyed, which they indulge with little or no restraint.

Do not harbor grudges after disagreements involving honest differences of opinion. Keep your arguments on an objective basis and leave personalities out as much as possible.

Form the habit of considering the feelings and habits of others.

Do not become unduly preoccupied with your own selfish interests. It may be natural enough to "look out for Number One first," but when you do your associates will leave the matter entirely in your hands, whereas they will be much readier to defend your interests for you if you characteristically neglect them for unselfish reasons.

This applies particularly to the matter of credit for accomplishments. It is much wiser to give your principal attention to the matter of getting the job done, or to building up your people, than to spend too much time pushing your personal interests ahead of everything else. You need have no fear of being overlooked; about the only way to lose credit for a creditable job is to grab for it too avidly.

Make it a rule to help the other fellow when the opportunity rises.

Even if you're mean-spirited enough to derive no satisfaction from accommodating others it's a good investment. The business world demands and expects cooperation and teamwork among the members of an organization. It's smarter and pleasanter to give it freely and ungrudgingly, up to the point of unduly neglecting your responsibilities.

Be particularly careful to be fair on all occasions.

This means a good deal more than just being fair, upon demand. All of us are frequently unfair, unintentionally, simply because we do not habitually view the matter from the other person's point of view, to be sure that his or her interests are fairly protected. For example, when a

person fails to carry out an assignment, he or she is sometimes unjustly criticized when the real fault lies with the manager who failed to give him or her the tools to do the job. Whenever you enjoy some natural advantage, or whenever you are in a position to injure someone seriously, it is especially incumbent upon you to "lean over backwards" to be fair and square.

Do not take yourself or your work too seriously.

A normal healthy sense of humor, under reasonable control, is much more becoming, even to an executive, than a chronically soured dead pan, a perpetually unrelieved air of deadly seriousness, or the pompous solemn dignity of a stuffed owl. It is much better for your blood pressure, and for the morale of the office, to laugh off an awkward situation now and then than to maintain a tense tragic atmosphere of stark disaster whenever matters take an embarrassing turn. To be sure, a serious matter should be taken seriously, and a person should maintain a quiet dignity as a rule, but it does more harm than good to preserve an oppressively heavy and funereal atmosphere around you.

Put yourself out just a little to be genuinely cordial in meeting people.

True cordiality is, of course, spontaneous and should never be affected, but neither should it be inhibited. We all know people who invariably pass us in the hall or encounter us elsewhere without a shadow of recognition. Whether this be due to inhibition or preoccupation we cannot help feeling that such unsociable chumps would not be missed much if we never saw them again. On the other hand it is difficult to think of anyone who is too cordial, although it can doubtless be over- done like anything else. It appears that most people tend naturally to be sufficiently reserved or else over-reserved in this respect.

Give other people the benefit of the doubt if you are inclined to suspect their motives, especially when you can afford to do so.

Mutual distrust and suspicion breed a great deal of absolutely unnecessary friction and trouble, frequently of a very serious nature. This is a very common phenomenon that can be observed among all classes and types of people, in inter- national as well as local affairs. It is derived chiefly from misunderstandings, pure ignorance, or from an ungenerous tendency to assume that a person is guilty until proved innocent. No doubt the latter assumption is the "safer" bet, but it is also true that if you treat others as depraved scoundrels, they will usually treat you likewise, and they will probably try to live down to what is expected of them.

Regard your personal integrity as one of your most important assets.

In the long pull there is hardly anything more important to you than your own self-respect and this alone should provide ample incentive to maintain the highest standard of ethics of which you are capable. But, apart from all considerations of ethics and morals, there are perfectly sound hardheaded business reasons for conscientiously guarding the integrity of your character.

One of the most striking phenomena of an engineering office is the transparency of character among the members of any group who have been associated for any length of time. In a surprisingly short period each individual is recognized, appraised, and catalogued for exactly what he or she is, with far greater accuracy than that individual usually realizes. This is true to such a degree that it makes people appear downright ludicrous when they assume a pose or otherwise try to convince us that they are something better than they are. As Emerson puts it: "What you are speaks so loud that I cannot hear what you are saying." In fact, it frequently happens that people are much better known and understood by their associates, collectively, than they know and understand themselves.

Therefore, it behooves you as an engineer to let your personal conduct, overtly and covertly, represent your conception of the very best practical standard of professional ethics, by which you are willing to let the world judge and rate you.

Moreover, it is morally healthy and tends to create a better atmosphere, if you will credit the other fellow with similar ethical standards, even though you may be imposed upon occasionally. The obsessing and overpowering fear of being cheated is the common characteristic of second- and third-rate personalities. This sort of psychology sometimes leads a person to assume an extremely "cagey" sophisticated attitude crediting him or herself with being impressively clever when he or she is simply taking advantage of his or her more considerate and fair-minded associates. On the other hand a substantial majority of top-flight executives are scrupulously fair, square, and straightforward in their dealings with all parties. In fact most of them are where they are largely because of this characteristic, which is one of the prime requisites of first-rate leadership.

The priceless and inevitable reward for uncompromising integrity is confidence, the confidence of associates, subordinates, and "outsiders." Confidence is such an invaluable business asset that even a moderate amount of it will easily outweigh any temporary advantage that might be gained by sharp practices.

Integrity of character is closely associated with sincerity, which is another extremely important quality. Obvious and marked sincerity is frequently a source of exceptional strength and influence in certain individuals, particularly in the case of speakers. Abraham Lincoln is a classic example. In any individual, sincerity is always appreciated, and insincerity is quickly detected and discounted.

In order to avoid any misunderstanding, it should be granted here that the average person, and certainly the average engineer, is by no means a low dishonest scoundrel. In fact, the average person would violently protest any questioning of his or her essential honesty and decency, perhaps fairly enough. But there is no premium upon this kind of common garden variety of honesty, which is always ready to compromise in a pinch. The average person will go off the gold standard or compromise with any sort of expediency whenever it becomes moderately uncomfortable to live up to his or her obligations. This is hardly what is meant by "integrity," and it is certainly difficult to base even a moderate degree of confidence upon the guarantee that you will not be cheated unless the going gets rough.

Finally, it should be observed that the various principles which have been expounded, like those of the arts and sciences, must be assiduously applied and developed in practice if they are to become really effective assets. It is much easier to recognize the validity of these "laws" than it is to apply them consistently. The important thing here is to select, in so far as possible, a favorable

atmosphere for the development of these professional skills. This is undoubtedly one of the major advantages of employment in a large engineering organization. Perhaps, even more important, as previously mentioned, is the selection of your boss, particularly during those first few years that constitute your engineering apprenticeship. No amount of precept is as effective as the proper kind of example. Unfortunately, there is not nearly enough of this kind of example to go around, and in any event it will behoove you to study the "rules of the game" to develop your own set of principles to guide you in your professional practice.

**BILL GATES' SPEECH TO MT. WHITNEY HIGH SCHOOL,
Visalia, California.**

Here's some advice Bill Gates purportedly dished out to high school graduates about 11 things they did not learn in school. He talked about how feel-good, politically correct teachings created a generation full of kids with no concept of reality and how this set them up for failure in the real world.

1. Life is not fair - get used to it.
2. The world won't care about your self-esteem. The world will expect you to accomplish something BEFORE you feel good about yourself.
3. You will NOT make 40 thousand dollars a year right out of high school. You won't be a vice-president with a car phone, until you earn both.
4. If you think your teacher is tough, wait till you get a boss. He doesn't have tenure.
5. Flipping burgers is not beneath your dignity. Your grandparents had a different word for burger flipping - they called it opportunity.
6. If you mess up, it's not your parents' fault, so don't whine about your mistakes, learn from them.
7. Before you were born, your parents weren't as boring as they are now. They got that way from paying your bills, cleaning your clothes and listening to you talk about how cool you are. So before you save the rain forest from the parasites of your parents' generation, try delousing the closet in your own room.
8. Your school may have done away with winners and losers but life has not. In some schools they have abolished failing grades and they'll give you as many

times as you want to get the right answer. This doesn't bear the slightest resemblance to ANYTHING in real life.

9. Life is not divided into semesters. You don't get summers off and very few employers are interested in helping you find yourself. Do that on your own time.
10. Television is NOT real life. In real life people actually have to leave the coffee shop and go to jobs.
11. Be nice to nerds. Chances are you'll end up working for one.

For All Engineers

However menial or trivial your early assignments may appear, give them your best effort. There is always a premium upon the ability to get things done.

In carrying out a project do not wait for foremen, vendors, and others to deliver the goods; go after them and keep everlastingly after them.

Confirm your instructions and the other fellows commitments in writing.

When sent out on any complaint or other assignment, stick with it and see it through to a successful finish.

Avoid the very appearance of vacillation.

Don't be timid, speak up, express yourself and promote your ideas.

Before asking for approval of any major action, have a definite plan and program worked out to support it.

Strive for conciseness and clarity in oral or written reports.

Be extremely careful of the accuracy of your statements.

In Relation to the Boss

Every executive must know what's going on in his bailiwick.

Do not overlook the fact that you're working for your boss.

Be as particular as you can in the selection of your boss.

One of the first things you owe your boss is to keep him informed of all significant developments.

Whatever the boss wants done takes top priority.

Do not be too anxious to follow the boss's lead, (i.e., do not bug him continuously for direction in a task).

Regarding Relations with Associates and Outsiders

Never invade the domain of any other division without the knowledge and consent of the executive in charge.

In all transactions be careful to deal-in everyone who has a right to be in.

Be careful about whom you mark for copies of letters, memos, etc., when the interests of other departments are involved.

Promises, schedules and estimates are necessary and important instruments in a well-ordered business.

When you are dissatisfied with the services of another section, make your complaint to the individual most directly responsible for the function involved.

In dealing with customers and outsiders remember that you represent the company, ostensibly with full responsibility and authority.

In Relation To Character and Personality

One of the most important personal traits is the ability to get along with all kinds of people.

Do not be too affable.

Regard your personal integrity as one of your most important assets.

A little profanity goes a long way.

Be careful of your personal appearance.

Analyze yourself and others.

For Engineering Supervisors

Every executive must know what's going on in his bailiwick.

Do not try to do it all yourself.

Put first things first, in applying yourself to your job.

Cultivate the habit of boiling matters down to their simplest terms.

Do not get excited in engineering emergencies keep your feet on the ground.

Engineering meetings should not be too large or too small.

Cultivate the habit of making brisk, clean-cut decisions.

Do not overlook the value of suitable preparation before announcing a major decision or policy.

Plan your work, then work your plan.

Be careful to freeze a new design when the development has progressed far enough.

Constantly review developments and other activities to make certain that actual benefits are commensurate with costs in money, time and manpower.

Make it a rule to require, and submit, regular periodic progress reports, as well as final reports on completed projects.

Do not have too many people reporting directly to one person.

Assign definite responsibilities.

If you haven't enough legal authority assume as much as you need.

Do not create bottlenecks.

What Every Supervisor Owes His Workers

Promote the personal and professional interests of your people on all occasions.

Do not hang onto a person too selfishly when he is offered a better opportunity elsewhere.

Do not short-circuit or override someone if you can possibly avoid it.

You owe it to your workers to keep them properly informed.

Do not criticize one of your people in front of others, especially his/her own subordinates.

Show an interest in what your people are doing.

Never miss a chance to commend or reward a person for a job well done.

Always accept full responsibility for your group and the individuals in it.

Do all that you can to see that each of your people gets all of the salary that he/she is entitled to.

Include interested individuals in introductions, luncheons, etc., when entertaining visitors.

Do all that you can to protect the personal interests of your people and their families, especially when they are in trouble.