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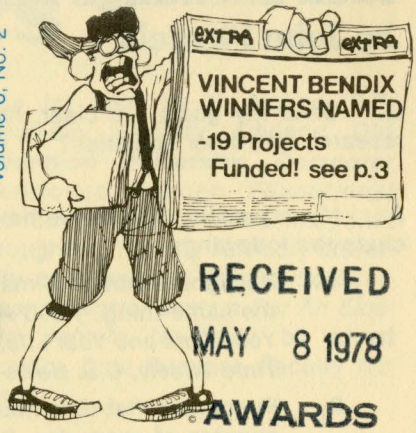


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# Employment Expectations

## by Gordon W. Brown

*Since 1970 when this article first appeared in the Student Journal, many changes have occurred in the job market; however, "expectations" of recent graduates and employers alike have remained remarkably constant. This article has been reproduced for its continued timeliness for those of you who are now preparing for entry into the profession.*
*— Editor —*

As long as there are engineering graduates, the subject of what will be expected of them as they begin their new careers will be timely. A fair share of a senior's time is spent deciding who his future employer will be, what department he should go with, what types of activities he will engage in, and whether he can handle it. Very probably, considerations such as these were part of the reason for your joining IEEE, and undoubtedly formed the core of many of your student branch meetings. Fortunately, humans are adaptable, and engineers more so. You will find that, within wide limits, one employer is not *better* than another, just *different*! (There's your rationalization for choosing the highest offer.) In assessing what will be expected of you, there are two broad questions which arise: What your new employer expects you to *do*, and what he expects you to *be*.

What you will be called upon to do will depend, of course, upon the size of your company, the department in which you have accepted a position and, perhaps most of all, your immediate supervisor. If your on-the-job training is handled properly, you will be given an assignment which is interesting to you, of value to the company, and a challenging learning experience. If you are in a design group, you might be faced with the design of a component or small system with the guidance of your supervisor. Analogously in production, a cost analysis or time-motion study of a particular operation would be appropriate. In sales, you would be called upon to become familiar with your company's products and their application, possibly by specifying a portion of some large order.

Occasionally, there are unfortunate cases of overhiring, stockpiling, and poor training programs that tend to shove a new engineer into a corner with nothing to do. If you find yourself in such a situation, seek ways to actively participate. Don't allow yourself to twiddle your thumbs and draw pay—you'll regret it. Such situations are much less likely to occur in today's economy, however, in which employers are selecting engineers much more carefully. For at least the next few years a new graduate is more likely to find himself overworked than underworked.

Expect your first assignments to be interesting, of value, and challenging. Expect also, however, some drudgery. There will undoubtedly be reports, paperwork, and red tape, all of which can be frustrating and time consuming. Make the best *of* it, and most importantly, do your best *with* it.

What kind of a person you are is intimately connected with what you will do, or rather how you will do it and how your employer will rate your performance. Personal habits and attitudes, as well as abilities, are important—far more important than what your specific assignments consist of:

*Naivete.* A good employer will not expect you to know everything. He will expect you to ask what you may think are stupid questions. In fact, he may feel that you are not sincerely interested if you *do not* ask.

*Willingness to learn.* This ties in with naivete, but also implies a desire and ability for continuing your formal and informal education. Many of you EE's will, through self learning, become ME's, CE's, meteorologists, and social psychologists before your careers are over—or even well established. Expect this, and as far as possible, encourage it.

If you approach your job with a positive attitude toward learning, you will benefit personally and your employer will benefit. Most employers look for this and regard highly such evidence as the MS degree and Professional Engineer registration.

**continued on pg. 7**

# Idea Exchange on Career & Life Planning

by John Picarelli

**Q.** Once my goals are clear, how can I effectively manage my time for research and other activities?

P.K., Victoria, Australia

**A.** My suggestions for better time management, something we all need, include the following:

1. Recognize that time management and life management are really the same thing. (Read Alan Lakein's book, *How To Get Control of Your Time and Your Life,* Signet Books, 1973; also *How To Use Your Time Wisely, U.S. News and World Report,* January 19,1976).
2. Recognize that time management doesn't mean planning every 15 minutes of every day. It does mean budgeting your time on your priorities and that demands that you become more aware of how you use and abuse your time. Alan Lakein has a rule he calls the *80/20 Rule.* "If all the things you want to do were weighted according to value, 80% of the value would come from only 20% of the items." Concentrate on those.
3. Keep a log of your time use for one or two weeks in 15 minute intervals to see really where your time goes. Set specific targets for improvement of your time management based on a careful review of your log. Don't get discouraged. New habits take time to form; old habits take time to break. Take it one step at a time.

Remember the words of President Eisenhower. He discovered that ". . .the important things are seldom urgent, and the urgent things are seldom important."

**Q.** I am finding it difficult to find agencies or companies that employ biomedical engineers. My primary interest is in research. I am willing to relocate anywhere in the United States but would prefer to stay on the east coast. I would appreciate any information you could provide me on employment opportunities or where to look.

K.W., Pittsfield, Massachusetts

**A.** I don't know of any ready made listing of opportunities in your field of interest. Even if one existed, your unique skills would first have to be fully analyzed in relation to the career and life goals you wish to pursue. It is better to begin creating your own list of opportunities. The question is where and how to start. Who should know? First and foremost, you must realize you're not looking for a job but rather *information* that would lead to a good decision concerning future employment. You need to find out what is going on in the field in relation to your interests. Who's doing the work? Then it becomes a matter of contacting each and every possible resource and gathering and evaluating current information. Sample resources include: (1) Trade and Professional Associations such as the National Association of Bioengineers (in Chicago) or the Biomedical Engineering Society (in Evanston, IL); (2) Corporations performing biomedical engineering research. Information is available through technical and trade publications in your library and through *Standard & Poor's Index* and *The Thomas Register.* You could easily write and ask for their corporate annual reports. Don't forget the government as an information source. Write your Congressman; and (3) Personal friends and contacts. Spread the word of your interests. Ask friends and acquaintances if they know of others to whom you could be referred.

Two Further Suggestions: (1) Consult Appendix E of *Where Do I Go From Here With My Life?* by Crystal and Bolles (Seabury Press, 1974) to give you other details to help you organize and conduct your research campaign; (2) Decide precisely where you would really like to *live* (separate from the notion of finding work there) then contact the Boards of Trade, Chambers of Commerce, Offices of Economic Development, etc. and have them send you all the information on organizations in your field operating in their area.

*Dr. Picarelli is the Dean of Washington International College and a Member of the IEEE's Student Activities Committee.

# Job Prospects to Improve in the U.S.

BETHLEHEM, PA — Job prospects for college graduates look better for the second year in a row, according to an early-season survey of employers just completed by the College Placement Council. However, hiring is expected to be selective, as it was last season, with employers primarily seeking top students.

Nearly 600 employers, responding to an annual survey by CPC, indicated that, overall, they expect to hire 16% more new college graduates than in 1976-77. This follows an 18% increase reported last year after two consecutive years of reduced hiring.

An even brighter note is the fact that 70% of the respondents expect business conditions in their organizations to improve in the first half of 1978 while only 5% foresee a decline. The remaining 25% anticipate no change from the last half of 1977.

Employer competition is expected to remain keen for engineers and for computer science majors. Demand for business and accounting is seen as beginning to soften as the supply of candidates grows, while "other non-technical" graduates will have to work at finding job opportunities, using imagination and ingenuity.

One of the major factors in bolstering this year's picture is the increased hiring expected by the Federal Government following a substantial cutback last year. Currently, employment opportunities in the Civil Service merit system, covering approximately 80 agencies, are expected to increase by 23% for all fields of study surveyed.

Following the pattern of recent years, engineering openings show the strongest upsurge, with a 27% improvement anticipated at all degree levels. The largest gain is projected for Ph.D. engineers — a 52% increase over 1976-77.

The number of jobs in the "sciences, math, and other technical" category is expected to increase 10% overall, with the biggest gain (23%) at the master's and doctoral levels. The business-related disciplines are projected for more modest increases: 6% at the bachelor's level and 9% at the master's.



# Bendix Award Winners

Thirty-eight of the IEEE's 400 eligible Student Branches submitted proposals in the 1977-78 Vincent Bendix Award competition. Of these, half will be funded for a total of $7,500. The number of entrants in this year's contest was the largest field of competitors in the program's twelve year history.

The Vincent Bendix Award program, sponsored by the Institute of Electrical and Electronics Engineers under a grant from the Bendix Corporation, provides up to $500 to IEEE Student Branches to support the work of Branch members on projects of their own device. The determination of recipients of the grants is based on a competitive evaluation of proposals.

The topics chosen by the students covered a wide range of areas—technical and non-technical. The projects vary in character from research in state-of-the-art technology to applied engineering in aiding the handicapped. Energy conservation through lighting control and the generation of electricity from alternate sources will be the focus of two of the projects; the renovation of Henry Ford's Fairlane power plant will be undertaken by one group and will serve to preserve this aspect of the heritage of electrical engineering; microprocessor monitoring and control of vehicles, both conventional internal combustion and electric, will be researched and developed by two teams; medical applications of electrical engineering are found in one project which will detect preclinical coronary artery disease. Three groups are taking a humanistic approach to engineering through applying their expertise and training to such projects as an audio clock for the blind, danger signals for the deaf and voice controlled wheelchairs for parapalegics.

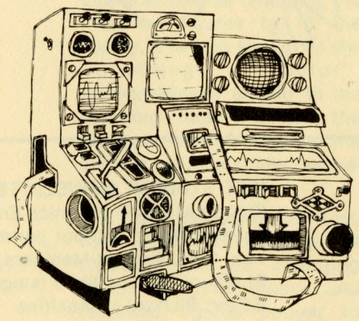
Since the competition's inception in 1965, 88 projects have been funded for over $36,000. Due to the growing interest among students in working on hardware-oriented projects, the Bendix Award competition has received increased support from the Bendix Corporation and the IEEE. In response to the overwhelming number of entries, the Life Member Fund of the IEEE contributed to the 1977-78 program which allowed the nine runner-up positions to be partially funded. This year's grant total is more than triple that of two years ago.

The 1977-78 competition will support twice the number of projects funded in any previous competition. The top ten positions have been designated the winners by the judging committee and the next nine as runners-up. The winners will receive full funding of their projects based upon their requested level of support. The runner-up positions will receive 75% of their requested level of support.

The winners for 1977-78 are: **Western Kentucky,** *A Low Cost, High Performance Digital Multimeter* for $500 by Cary Hester, W.R. Moore, Faculty Advisor; **University of Michigan,** *Project to Renovate Henry Ford's Fairlane Power Plant* for $495 by Burt L. Burley, Murray Miller, Faculty Advisor; **Southern Illinois University-Edwardsville,** *Audio Output of Chronological Date: An Aid to the Blind and Physically Impaired* for $375 by Daniel Braun, R. Bollini, Faculty Advisor; **University Catholique de Louvain,** *Applications of a Microprocessor to the Section's Ham-Radio Station: a More Code to ASCII Translator* for $500 by Eric Devolder, M. Declercq, Faculty Advisor; **University Pennsylvania/Temple University,** *Microprocessor Controller for Eye Movement Contingent Communication Prosthesis* for $298 by I. Laefsky, V.K. Schulz, Faculty Advisor; **University of Tennessee,** *Energy Conservation Through the Control of Room Lighting on a University Campus* for $500 by G. Roulette, Frederick W. Symonds, Faculty Advisor; **Virginia Polytechnic Institute and State University,** *Experimental Measurements of Optical Field Scattering and Absorption* for $500 by D.D. Powell, Richard O. Claus, Faculty Advisor; **Tulane University,** *Microprocessor-Based Monitoring System with Automotive Application* for $500 by H. Molina, P.F. Duvoisin, Faculty Advisor; **Old Dominion University,** *Computer Controlled Robotic Educational Device* for $500 by J.B. Miller, J.W. Stoughton, Faculty Advisor; **University of Kansas,** *A Microprocessor-Based Control System For An Electric Vehicle* for $500 by Lloyd Coultis, Dale Rummer, Faculty Advisor.

The runners-up are: **Drexel University,** *Isolated Word Recognition System for Quadrapalegic Wheelchair Control;* **Indian Institute of Technology,** *Relating Certain Mental Abilities to the Electrical Activity in the Human Brain;* **Cooper Union,** *A Microprocessor-based System for Detecting Preclinical Coronary Artery Disease;* **State University of New York-Canton,** *Electrical Energy Generator and Electronic Controls for the ATC-Wind Energy Conversion System (ATC-WECS);* **San Francisco State University,** *A Proposal for the Design and Construction of an Electronic Annunciator;* **Trenton State College,** *Universal Microprocessor Based Speech Synthesizer;* **Northern Arizona University,** *Remotely-Piloted Robot;* **Southeastern Massachusetts University,** *Train Position Sensing for MURAIL-Microprocessor Controlled Small Scale Train System;* **Katholieke Universiteit Leuven,** *Danger Signal Detector for Deaf.*

**UNIVERSITY OF TENNESSEE'S Vincent Bendix Project**



Proposed Lighting Control Panel

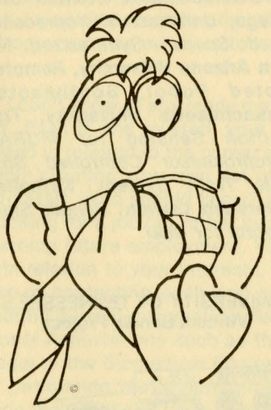
# For Once ... Easy Essay Questions!

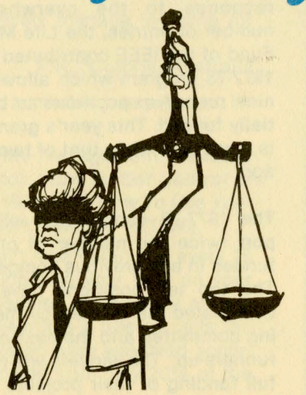
*Instructions: Read each question carefully; answer all questions; limit essays to 4000 words; time limit: 2 hours. Reference only MURPHY'S RULES FOR EFFECTIVE RESEARCH AND ENGINEERING and the HARBRACE HANDBOOK.*

**Medicine**- You have been provided with a razor blade, gauze, and a bottle of Scotch. Remove your appendix. Do not suture until your work has been inspected. You have 18 minutes.

**Public Speaking**- Two thousand drug-crazed aborogines are storming the room. Calm them. You may use any ancient language except Latin or Greek.

**Biology**- Create life. Implicit in this assignment is that the use of any other form of life is not allowed since life must be created, not simply reproduced or modified.





**Engineering**- The disassembled parts of a high-powered rifle have been placed in a box on the table; included is an instruction manual printed in Swahili. In 10 minutes a hungry Bengal tiger will be admitted to the room. Take whatever action you may feel appropriate. Be prepared to justify your decision.

**Sociology**- What sociological problems might accompany the end of the world? Construct an experiment to test your theory. First, prepare an Environmental Impact Statement acceptable to the Sierra Club.

**Psychology**- Based on what you have read in the newspapers, evaluate the emotional stability, degree of adjustment, and the repressed frustrations of each: Anita Bryant, Billy Carter, Sigmund Freud, Richard Nixon.

**Political Science**- There is a red telephone in front of you. Start World War III. Report at length on its social/political effects, if any. Again, prepare an Environmental Impact Statement.

**Economics**- Develop a realistic plan for refinancing the national debt.

**Physics**- Create matter. The use of any form of energy is not allowed.

**Mathematics**- Reconstruct the system such that **e** and $\pi$ are whole numbers.

**Law**- Take a position for or against truth as it relates to justice. If your position is pro, explain the paradox this creates with the U.S. judicial system.

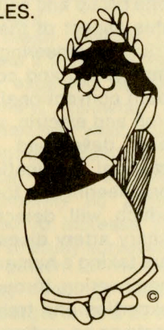
**Construction**- Build a full scale replica of the Great Pyramid. Use only the resources similar to those at the disposal of the ancient Egyptians. Note: this a Union job, no slave labor is allowed. You have 17 minutes.

**Philosophy**- Trace the development of human thought. Compare this with the development of any other kind of thought.

**General Knowledge**- Describe in detail, briefly.

***Extra Credit***

DEFINE THE UNIVERSE; GIVE THREE EXAMPLES.



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# Murphey's Law Can't Go Wrong

**Murphy's Laws of Research and Engineering**

**First Law:** In any field of endeavor, anything that can go wrong *will* go wrong.

*Corollary 1:* Everything goes wrong at one time.
*Corollary 2:* If there is a possibility of several things going wrong, the one that will go wrong is the one that will do the most damage.
*Corollary 3:* Left to themselves, things will always go from bad to worse.
*Corollary 4:* Plans must be reproducible; they should fail in the same way.
*Corollary 5:* Nature always sides with the hidden flaw.
*Corollary 6:* If everything seems to be going well, you have overlooked something.

**Second Law:** It is usually impractical to worry beforehand about interference during system implementation; if you have none, someone will supply it for you.

*Corollary 1:* Information necessitating a change in plans will be conveyed to you after, and only after, the plans are complete.
*Corollary 2:* In listing alternatives, presenting one obvious right way versus one obvious wrong way, it is often wiser to choose the wrong way to expedite subsequent revisions.
*Corollary 3:* The more innocuous a modification appears to be, the further its influence will extend and the more plans will have to be redrawn.

**Third Law:** In any collection of performance and data, the figures that are obviously correct and beyond all need of checking contain the errors.

*Corollary 1:* Those you ask for help will not see the error.
*Corollary 2:* Any nagging intruder who stops by with unsought advice will spot it immediately.

**Fourth Law:** If in any problem situation you find yourself doing an immense amount of work, the answer can be obtained by simple inspection.

**Murphy's Rules for Effective Research and Engineering**

*Rule 1:* Prepare no plans or proposals simply if a way can be found to make them complex and wonderful.
*Rule 2:* A detailed compilation of data is useful; it indicates that you have been busy.
*Rule 3:* Before studying a subject, first understand it thoroughly.
*Rule 4:* Do not believe in luck; rely on it.
*Rule 5:* Always leave room, when writing a report, to add another explanation if the first one does not work (Rule of the Way Out).

*Rule 6* Always use the most recent developments in the field:

—Items such as Finagle's Constant and the more subtle Bougerre Factor are loosely grouped in under constant variables, or, if you prefer, variable constants.

—Finagle's Constant, a multiplier of the zero-order term, may be characterized as changing the theory to fit the recorded figures.

—The Bougerre Factor is characterized as changing the recorded figures to fit the theory. It is also known as the "Soothing Factor"; mathematically similar to the damping factor, it has the characteristic of dropping the subject variance under discussion to zero.

—A combination of the two, the Diddle Coefficient, is characterized as changing things so that theory and recorded figures appear to match without requiring a change in either.

## What Does That Mean?

1. IT IS BEING PROCESSED
2. WE WILL LOOK INTO IT
3. A PROGRAM
4. EXPEDITE
5. CHANNELS
6. LET'S GET TOGETHER ON THIS
7. UNDER ACTIVE CONSIDERATION
8. COORDINATOR
9. TO NOTE AND INITIAL
10. CONSULTANT
11. TO ACTIVATE
12. TO IMPLEMENT THE PROGRAM
13. UNDER CONSIDERATION
14. A MEETING
15. TO NEGOTIATE
16. WE ARE MAKING A SURVEY
17. A CLARIFICATION
18. UNIMPEACHABLE SOURCE
19. INFORMED SOURCE
20. RELIABLE SOURCE

*This vocabulary test is a modified version of one which was printed in a North Dakota State University Branch newsletter. The answers as they gave them will appear in our next issue.*

**a.** A mass mulling by master-minds.
**b.** The guy who started the rumor originally.
**c.** Any assignment that can't be completed in one telephone call.
**d.** Hire more people and expand the office.
**e.** I'm assuming you're as confused as I am.
**f.** So wrapped up in red tape that the situation is hopeless.
**g.** To confound confusion by commotion.
**h.** We need more time to think of an answer.
**i.** By the time the wheel makes a full turn, we assume you will have forgotten about it, too.
**j.** The guy who has a desk between two expeditors.
**k.** We're looking in the files for it.
**l.** Let's spread the responsibility for this.
**m.** The guy you just met.
**n.** To fill in the background with so many details that the foreground goes underground.
**o.** To make carbons and add more names to the memo.
**p.** The trail left by inter-office memos.
**q.** Any ordinary guy more than 50 miles from home.
**r.** To seek a meeting of minds without the knocking together of heads.
**s.** The guy who told the guy you just met.
**t.** Never heard of it.

# What Students Should Know About Interviewing

## by General Electric

**How students can get ready for an interview.**

**Know where you want to go.** First, we tell students to figure out what they really want to do. Be specific, we say. Make a list of exactly what you want. *And* of what you *don't* want. If they're having trouble deciding, we suggest looking at their past for clues. Education, summer jobs, hobbies, clubs. . .all can suggest motivations. In addition, we always tell them to get help from their counselor. An interview won't be successful until students have some idea of what they're after.

**Know all you can about the company.** Students get told this over and over. And we tell them again. Because it's important. Reading "the literature" will tell them all kinds of things about a company. . its corporate personality, its job openings and what they're like, its benefits, on and on. Having to answer this type of question in an interview wastes time and may make the interviewer wonder about the candidate's initiative.

**Know the routine of an interview.** Students who don't have any idea what's going to happen in the interview won't be relaxed, and won't present their natural personality. So we tell them to discuss it with their counselor. Or find a friend who's had a few interviews and ask what they were like. We even suggest a role-playing exercise with the friend as interviewer. And the student as himself.

**Make sure the interviewer will know all about you.** Some students don't think filling out the paperwork is very important. They give incomplete answers. Or don't take the time to be neat. But they're only hurting themselves. Because they keep the interviewer from learning everything possible about their past achievements and interests. We tell them to take time to fill out a company's information form completely. If one isn't available at the placement office, we suggest bringing a resume along to save time.

**What an interviewer looks for in a student.**

**A lot of facts in a short time.** First, we make sure students realize how short an interview is. Then we make sure they understand what the interviewer's basic purpose is. They want to exchange enough information to make a screening decision to determine whether their company should talk with the student further.

**They want to see what you're like.** Good interviewers usually note their first impression of a student. Because the ability to make a good first impression can be an asset in business. Then during the interview they look at general traits such as poise, ability to communicate, basic social skills and general personality. They're not after a deep psychological profile, only a general picture.

**They want to see what you want.** One of the most important things to an interviewer is finding out exactly what students think they want, and why. What kind of work they're looking for. . .and the extent of their interest in that work. Career goals. And drive to accomplish those goals. Their interest in further education. Further training. And such things as preferred location and willingness to relocate.

**They want to see what you've done.** Next, they'll look at the student's qualifications. Jobs, grades, special training, hobbies, and extracurricular activities. Here they aren't just looking to see how "well-rounded" the student is. Their major purpose is to decide if the student's declared work interests seem to match his or her talents.

**They want to see what you might do.** If the student does seem qualified for a certin kind of work, interviewers then have to see if their company has a job area that might match the student's interests. If so, they'll explain all the details of the work and see if the student seems interested. And just how interested.

**How a student should act during an interview.**

**Rule number one.** We say it to students every day. There's one important thing to remember about how to act during an interview. Don't act. Be yourself, we advise. For two good reasons. First because the only company students are likely to be happy working for is a company that likes them just the way they are. And second because few students can play a role well enough to fool an interviewer anyway.

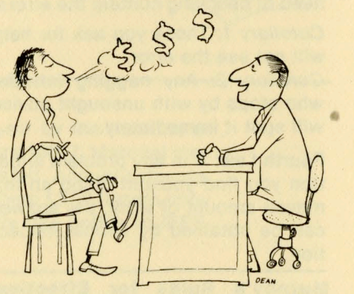
**Don't overdo it.** Of course, while we're telling students to act naturally we also remind them to act professionally. They should be on time. Friendly. . .but not too casual. Courteous. And have their thoughts and questions well organized.

**Open up.** Another thing we tell them is don't be afraid to tell interviewers all about yourself. When they ask a question, don't just answer "yes" or "no". Take the opportunity to tell them your goals and strong points. Often this may alert an interviewer to an attribute that didn't show up on the student's resume.

**Tell it straight.** Finally, we tell students to be completely honest. Because a lie is usually an attempt to hide some problem that will only get in the way of a good student/company match later on. For example, if a student has no interest in finance, he or she should say so. They should be trying to screen companies, too. So if all a company offers is finance, they probably should'nt work there.

**What students should expect after an interview.**

**Don't expect to be hired on the spot.** We make sure students realize that interviewers aren't there to hire anybody right away. They're only trying to make a screening decision to determine whether their company should talk with a student further. We explain that by the end of the interview, most companies will try to spell out as clearly as possible what to expect next. (Whom any further action will come from and when.)




I suppose you're interested in what we offer as a starting salary.

**How companies tell you they're interested.** Even when interviewers think a student is highly qualified, they'll rarely promise anything, we explain. Because they can't be 100% sure what their company might later decide. They may encourage the student to try to build interest in working for the company. But they won't make promises. We explain that a student under active consideration can usually expect an invitation to a second interview, usually at a company location, or a request for more information within a short time.

**How you can tell them you're interested.** If students have a strong interest in a company we may suggest they write to the interviewer confirming that interest. They should mention the interviewer's name, time and date of the original interview, plus any important points discussed. Another good way to demonstrate interest in a company is to demonstrate knowledge of it. We advise students (especially those already invited to a second interview) to read the annual report, company literature, Standard and Poor's, anything they can find about the company.

**How they tell you "No".** During an interview it sometimes becomes obvious that a student's interests and a company's opportunities simply don't match. A good interviewer will frankly, but courteously, tell the student. Saving each party time. And helping the student zero-in on the right kind of company that much sooner. In many cases, students who aren't offered a job will be informed within a few weeks of the interview. In other cases, students may not receive any further correspondence unless a suitable position is identified before their date of availability. A negative reply may dent their egos a little. But we tell them not to worry. Almost everybody hears a "no" or two before they land a job.

Cont. from pg. 1

This latter item deserves special note. Many of you have already taken the Engineer in Training (EIT) exam in preparation for the PE exam in a few years. Professional Engineer registration is often required, particularly in government engineering work, and even if it is not, the fact that you pursue registration is a measure of your enthusiasm for your career. Seriously consider obtaining PE registration and taking the EIT exam at your first opportunity.

*Responsibility.* Under this heading fall most of the important requirements of a good engineer. Whatever task you are given, you will be expected to handle it responsibly. This implies *thoroughness*—any task should be done completely. When any task to which you are assigned is considered by you to be done, your employer will expect it to be just that—done in such a way that will not require him to have all or part of it redone. To achieve this often requires *patience* and *perseverance*—check and recheck alternatives and examine objectives and techniques. Engineering is often simply a matter of intelligent choice between alternatives. You will frequently find yourself faced with a choice between two equally valid alternatives. At such times, be *decisive*— make a choice. Very often all too much time and money are wasted hemming and hawing over which way to go. This indecisiveness can be more costly than going the wrong way.

Management makes decisions based on the information you give them. If you mislead them, they may very well make the wrong ones. If you have made a mistake (which you will!), be *honest* about it. If errors in a design are covered up, they will invariably come back to haunt, through failure of a device or system, or somebody else's system will be cheaper and better.

*Company interest.* Your employer will expect a certain degree of loyalty and gratitude. Nearly every company at first loses money on its young engineers—frequently for the first six months to a year. It expects you to ultimately be productive enough to make up this loss. In addition, your normal cost to a company, is depending on overhead, $100 to $200 per day. It often comes as a shock to young engineers to discover they must be worth this plus a profit to the company.

*Creativity.* You would not have been hired if your employer did not think that you were creative. The act of creation has been defined as the resulting interaction of two independent matrices of perception and reasoning. You will be expected to bring your education and particular knowledge into contact with that of your new colleagues, and into contact with the products, output, and techniques of your employer, searching for the creative interaction that results in improvements, new techniques, new products, and new customers.

*Ability to communicate.* You will be expected to write proposals, reports, articles, letters; give oral presentations to your immediate supervisor; have meetings with your fellow employees and technical associates. All these communications should convey precisely and concisely what you want them to. I often damn the computer for doing what I *tell* it to do and not what I *want* it to do. In the same sense, you must strive to make your words effectively convey what you mean.

*Ability to work effectively with others.* Perhaps the most important characteristic you can possess is an ability to get along with other people. Tolerance of viewpoints of others, and application of the principle of the golden rule will serve you well.

*Knowledge of engineering fundamentals.* On rare occasions you may be called upon to use one or two of the technical facts you picked up in school. This item is perhaps least essential, since (1) by your degree you have demonstrated your ability to learn and (2) it is only rarely that the lack of specific knowledge represents a serious stumbling block to the young engineer.

As a concluding note, it is well to remember that a job, like anything else in life, is largely what you make it. If you apply yourself, seek ways in which you can contribute, and actively learn, there is no doubt of your becoming a successful engineer. Good luck!

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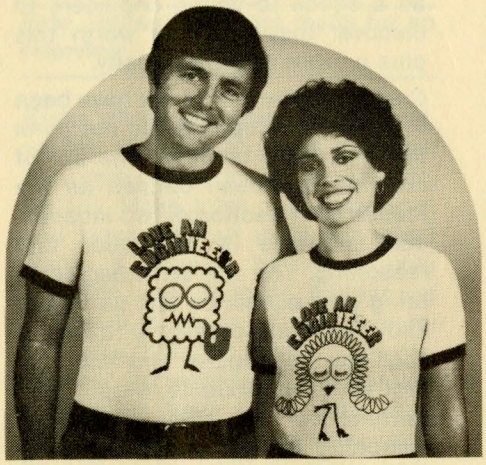

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