JOB HUNTING, ADJUSTING, FLOURISHING

THE TRANSITION FROM COLLEGE STUDENT
TO
ENGINEERING PROFESSIONAL

Talk Given to

Student Groups and Design Teams
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by

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This is a combination of my experience, observations of successful engineers, and recent talks I've had with engineering employers. Hopefully this can shed some light on the attributes that engineering employers are looking for and the skills they expect their new employees to possess or develop.

Today's Job Market
- Extremely competitive and results-oriented (*must dispel stereotypes below*).
- Theoretical capabilities often taken for granted, depending on GPA.
- Need some kind of edge to get hired, especially if there is a tight job market.
- Tremendous incentive to find out what employers are looking for.

Desirable Attributes
- Self-learning (BS degree = learning how to learn).
- Know your strengths/weaknesses.
- Strong integrity, ethics (what you do when no one is watching).
- Dependability, perseverance/tenaciousness, self confidence, and **positive attitude**.
- Decision making skills (without 100% of data).
- Adaptability and flexibility (willingness to dive into new things).
- Good work ethic, confidence, motivation, self-starter, enthusiasm (x3).
- Willingness to take on responsibility (and be responsible).
- Communications skills (reading, writing, speaking, **listening**).
- Interpersonal skills & ability to work with other people (team skills).
- Rapport builder, conflict resolver.
- Creativity, insight, understanding of concepts.
- Critical thinking and problem solving skills (not solution duplicators).
- Ability to work in a multi-disciplined environment.

Perceptions or Attributes That Don't Help Your Cause
- Arrogance, superiority complex (won't admit mistakes).
- Passivity, lack of anticipation.
- Lack of curiosity, no cause-and-effect understanding of how/why things work.
- Lack of humility (won't take constructive criticism).
- Rigidity, inflexibility in schedules or tasks, unwillingness to take on new challenges.
- Loners who don't work well in groups.
- Design copiers ("I don't know why, but it worked on the last project.")
- Lack of insight or understanding of concepts.
- Thick regional accent can sometimes detract from your qualifications.
- Poor speaking skills, poor writing skills.
- Inability to make clear design sketches or archival notes, poor/illegible handwriting.

Worst-Case Priorities and Perspectives (Stereotypes to avoid)
- Survive one class at a time.
- Education = learning what's needed to pass the test.
- Good instructor = nice guy who gives easy tests.
- Graduation ==> job ==> live happily every after.
- General idea of type of employer desired, but no long range career goals.
- Little idea of how to get hired, let alone thrive in such a job.

It might be helpful to go through the typical transition into a new job.

Orientation (First few days on the job may be slow)
- Spend a day with personnel - payroll, benefits, orientation films, etc.
- Get your desk set up, find paper and pencils, etc.
- First impressions co-workers have are important (listen more than you talk).

Skill Development (Growth)
- Learn company procedures
- Learn hardware:
        - How to specify (pick closest standard unit).
        - Manufacturers
        - Cost
        - Lead time
- Learn design standards:
        - Drafting standards
        - Equipment specification standards
        - Learn company system design standards
        - Learn each client's design standards (often necessary).
- Computer studies
- Specification writing (technical and legal).
- Cost estimating
- Bid evaluation
- Project scheduling
- Contract Administration
- Factory visits and conformance testing.
- Field inspections (short term field engineering).
- Construction Management (project field engineer).
- Client/customer relations
- Business Development

Most Important (Sometimes Startling) Realizations
- Your education only teaches fundamentals - you have learned how to learn.
- Must constantly keep up on new hardware, software, costs, etc.
- Ability to communicate is extremely important.
        - Memos
        - Design notes (you're not working alone anymore).
        - Letters of technical/legal importance.
        - Specifications
        - Meetings (design, negotiations for $$$, etc.)
        - Conferences - exchange ideas.
- Interpersonal skills, or "people" skills, are very important.
- The hardest workers don't always get the biggest raise.
- The slackers don't always get the smallest raise.
- Support personnel and how you work with them can make or break a project.
- Appearance/image amplifies/attenuates good and bad performances.
- A bad reputation lasts forever - not like fresh start in each college class.

Rewards (your salary isn't everything):
- Achievement (building high self-esteem).
- Recognition (respect of others)
- Enjoyment of work (fun)
- Advancement and responsibility (growth).

Many of the important aspects of an engineering job seem to be non-technical. With that in mind, let's take a look at some important considerations that will impact your career as an engineer. These ideas are taken from my own experience, as well as from books I've read and student-employer seminars I've attended. The importance of each of the items below will vary from workplace to workplace.

Economics and Design
- Design to cost constraints - avoid "creeping elegance."
- Design for the customer and maintenance people, not for yourself.
- Get to know the hardware, mfrs, costs, lead times.
- Efficiency in time/cost of design (time is money).
- Cost of construction.
- Bottom line: on time and under budget.

Environment
- Must learn environment impact of materials used.
      - Construction/maintenance hazards.
      - PCBs, CFCs, battery acids, etc.
- Design for recycling and ease of repair.
- New laws could make design expensive or impossible.
- Must stay informed of environmental developments.

Multi-Disciplined Working Environment
- Must coordinate with MEs, CEs, Structurals, Architects, etc.
- Understand how their design decisions impact your design.
- Learn the nature of their design tasks and how long they take.
- Don't minimalize their importance - pick up what details you can of their work.

Interpersonal Skills (Surviving and Thriving)
- Communications: speak and write clearly and concisely.
- Being able to work in groups
- Being able to get along in high-stress environment.
- Negotiating: tasks, raises, etc.
- Anticipating changes, positioning yourself
- Office politics. Advice/truisms:
      - Watch and listen - you'll learn a lot.
      - Find a willing mentor and learn rewards system.
      - Build yourself up - don't tear others down.
      - Be nice to others on the way up, or you'll see them again on the way down.
      - Learn the chain of command and don't jump it unless all else fails.
      - Don't hack off support personnel (drafting, repro, secretarial, accounting, etc.)
      - Life isn't always fair -- deal with it constructively.
- Develop your social skills - there's more to life than engineering and computers.

Engineering Management Perspectives
- Training a new hire is an investment.
- How long will they stay before changing jobs?
- Need coursework foundation + teamwork + streetsmarts.

Nature of Workplace is Changing
- One supervisor for 20 employees (used to be 6:1)
- Self-management - more "rope to hang yourself with" if you let things slide.
- Quality time - be prepared and efficient with chances to talk to boss.
- Must be self-motivated, work within limited structure with long term goals in mind.
- Fragmented tasks, fast-changing organizations.
- Much more team work, interfacing with people.
- Peer mentoring on the increase - works in "growth culture" where it's not competitive.

Desireable Traits, Mentoring
- Open communications
- Candor is good. Not much politics in the beginning. Focus on engineering skills.
- Not afraid to give feedback on what's going well/badly - allows "targeted mentoring"
- Project a commitment to reassure them that investment in you will pay off.
- Self-teaching is very important.
- Be resourceful
- Thinking on your feet
- Find a willing mentor - they will not come to you.

Down the Road...
- How do you deal with failure or adversity? Deny it? Accept it?
- Use failure as growth opportunity.
- Be accountable for your actions ("P.E. Mentality")
- Use professional judgement in adverse situations - "step up to the plate"