



Lifelong Learning

- You do NOT quit the educational process when you graduate.
- **And that is regardless of whether your degree is a BSEE, and MSEE, or a Ph. D. EE.**
- **EE's live and work in a high-tech environment where today's "hot tech topics" will be in the dust bin tomorrow.**
- **The sad (and dangerous) truth is that unless you keep your EE knowledge current, your chances of retaining a top job in the profession are miniscule!**



Going to School After “School”

- So, assuming you have graduated, how in the world do you improve and sharpen your EE tools once you are in a full-time job?
- It turns out that there are a number of good methods for “continuing education,” as it is sometimes referred to.
- One of the routes to continued learning lies with what we all hope will come to be known as your “alma mater,” **The University of Texas at Dallas**.



Graduate School, or “Really Learning an EE Discipline”

- A UTD graduate EE program allows UTD alumni with a BSEE to gain a much more complete understanding of a particular EE discipline.
- **One of the problems with undergraduate EE programs in general is that there is a great deal to teach, and a limited number of credit hours (128 at UTD).**
- Therefore, you do not get an in-depth treatment of any EE technology area.
- **The good news: At UTD, there are quite a few graduate EE programs that can make you an expert in several of these areas.**



Graduate School (2)

- **At UTD a number of graduate technical areas are available in EE:**
 - **Electrical Design Engineer**
 - **Biomedical Engineer**
 - **Circuits and Design Engineer**
 - **Communications and Signal Processing Engineer**
 - **Digital Systems Engineer**
 - **Systems Engineer**
 - **RF and Microwave Engineer**
- **An MSEE in any of these areas can give you substantial proficiency in a specific technical area, improving your education and making you a better engineer.**



More Good News

- **Employers want their engineers to be technically proficient and up-to-date.**
- **Many employers will pay for master's degree courses for their engineering employees. It is not too difficult to take 3-4 courses at night over a year, so that you can earn an MSEE in three years or so.**
- **MS scholarships are also available at UTD. A student can complete the BSEE degree and move immediately into the master's program before venturing into industry. Often, it is easier to take this first step into "lifelong learning" before entering the workforce.**



“Fast Track”

- There are a number of **“Fast Track”** programs at UTD.
- **In EE, this program enables gifted senior UG students to include master’s-level courses in their degree plans.**
- When a successful **Fast-Track** student graduates with a BS degree, he or she is automatically admitted to graduate school at UT Dallas without need to take the Graduate Records Exam (GRE).
- **The number of hours required to complete the MS degree is reduced by the number of Fast-Track graduate hours completed with grades of B or better.**



“Fast Track” (2)

- For example, a **Fast-Track** undergraduate who passed 12 hours of well-chosen graduate coursework with grades of A or B would have only $33 - 12 = 21$ hours of coursework left to complete the MS degree.
- An undergraduate qualifies for the **Fast-Track** program if he/she meets the following qualifications:
 - Completed at least 15 hours at UT Dallas.
 - Repeated no more than 3 courses at UT Dallas and has repeated no course more than once.
 - Within 30 hours of graduation.
 - Overall GPA for all college courses of at least 3.0.



“Fast Track” (3)

- **Qualifications (continued):**
 - **Has completed at least six of the following benchmark EE courses with an average grade of at least 3.33:**
 - **CE/EE/MECH 3300 Advanced Engineering Math**
 - **CE/EE/TE 3301 Electrical Network Analysis**
 - **CE/EE/TE 3302 Signals and Systems**
 - **CE/EE 3310 Electronic Devices**
 - **CE/EE 3311 Electronic Circuits**
 - **CE/EE 3320 Digital Circuits**
 - **EE 3350 Communications Systems**
 - **EE 4301 Electromagnetic Engineering I**
 - **There are similar requirements for CE, TE, etc.**



“Get Doc”

- The “Get Doc” program, offered in ECS, is designed to encourage outstanding undergraduate students to pursue a Ph.D. at the Jonsson School.
- Support includes a research assistantship stipend (typically \$1500-1800/month) plus a tuition/fee waiver for a full graduate load (normally 12 hours).
- The Jonsson School shares the Graduate student’s research salary with the supervising professor.
- “Get Doc” provides an outstanding career option for high-achieving students who are interested in research.



“Get Doc” (2)

- The “Get Doc” program is for students who complete at least 60 hours in ECS. Transfer students with senior standing and 30 hours at UT Dallas can be considered.
- A minimum GPA of 3.5 is required for an application to be considered, and a tenure-track faculty member must agree to supervise the research and provide partial support for the award recipient.
- Awards will be based on several factors, including GPA, GRE scores, reference letters, performance in graduate classes (Fast Track) and involvement in research as an undergraduate.



Learning at Work

- **Once you are employed full-time, companies offer you many opportunities for learning, including:**
 - **Special seminars covering work-related skills (for example, at TI, there are courses in wafer-fab [integrated circuit] operations).**
 - **Short courses (sometimes taught by university faculty) to upgrade engineering skills.**
 - **Special seminars on work-related topics (e.g., improving team performance, task management, project planning, etc.).**
 - **Management training, as engineers progress in their profession, and enter the world of managing projects and work groups.**



Other Educational Opportunities

- **There are any number of other venues for continuous learning that exist outside of university and company educational resources.**
- **These include:**
 - **Technical and professional associations (such as IEEE, the Institute of Electrical and Electronics Engineers)**
 - **Independent educational entities (for-profit universities and training companies)**
 - **Special interest groups**
 - **Voluntary organizations employing technical professionals**



The IEEE

- **The IEEE (Institute of Electrical and Electronics Engineers) is the main professional society of electrical engineers.**
- **IEEE, as a profession-oriented group, is continually concerned about promoting continuing education of its members.**
- **IEEE is a very good vehicle for the electrical engineering professional to use in maintaining and upgrading his/her professional knowledge and competence.**



About IEEE

- **The IEEE was formed from two professional societies that existed in the mid-1950's.**
- **These societies were the AIEE, the American Institute of Electrical Engineers, and the IRE, the Institute of Radio Engineers.**
- **AIEE was the older body, founded in the earliest days of professional electrical engineering.**
- **The IRE was founded later, by EE's concerned that the AIEE was not adequately addressing the professional interests of EE's in the new field of electronics.**

The AIEE*

- In the spring of 1884, a small group of individuals in “electrical professions” met in New York to form an organization to support professionals in the new field of electrical device design and production.
- Formed to “assist in efforts to apply innovation for the betterment of humanity,” it became the American Institute of Electrical Engineers.
- In October, 1884 the AIEE held its first technical meeting in Philadelphia. Many early leaders, such as founding President Norvin Green of Western Union, came from telegraphy.
- Other early members, such as Thomas Edison, came from power, while Alexander Graham Bell represented the newer telephone industry.

* The historical information following is courtesy of IEEE records.

The AIEE (2)

- As electric power spread rapidly across the US, spurred by innovations such as **Tesla's AC Induction Motor**, long distance AC transmission and large-scale power plants (**by such companies as Westinghouse and General Electric**), AIEE became increasingly focused on electrical power and its ability to change people's lives through new electrical products and services.
- There was a secondary focus on wired communication, (telegraph and the telephone). Through technical meetings, publications, and promotion of standards, the AIEE led the growth of the EE profession.



The IRE

- A new industry arose beginning with Marconi's wireless telegraphy experiments at the turn of the century. What was originally called "wireless" became radio with the electrical amplification possibilities inherent in the vacuum tubes which evolved from John Fleming's diode and Lee de Forest's triode. With the new industry came a new society in 1912, the Institute of Radio Engineers.
- IRE was modeled on the AIEE, but was devoted to radio, and then increasingly to electronics. It, too, furthered its profession by linking members through publications, standards and conferences, and encouraging them to advance their industries by promoting innovation and excellence in emerging products and services.



The Merger

- In the next 40 years, electrical products penetrated more and more deeply into American life, (e.g., television, radar, and computers). **Interests of AIEE and IRE members increasingly overlapped.**
- Membership in both societies grew, **but from the 1940's, the IRE grew faster and by 1957, was the larger group.** On 1 January 1963, AIEE and IRE merged to form the **Institute of Electrical and Electronics Engineers, or IEEE.** At its formation, the IEEE had 150,000 members, 140,000 of whom were in the United States.



IEEE Today

- Over decades that followed, electrical and electronic technologies continued to spread into more and more areas of people's lives.
- Professional groups and technical boards of predecessor institutions evolved into IEEE Societies (sub-groups of IEEE members with like interests).
- By the early 2000's, IEEE served members and their interests with 38 societies, 130 journals, transactions and magazines, and more 300 conferences annually.



IEEE Today (2)

- **IEEE's fields of interest have greatly expanded beyond electrical/electronic engineering into areas such as nanotechnology, bioengineering, and robotics, and many others.**
- **As electronics became ubiquitous, from jet cockpits to industrial robots to medical imaging to household appliances, IEEE has become a global (and not just American) institution.**
- **By 2010, IEEE had over 400,000 members in 160 countries. IEEE is currently the world's largest technical professional association.**



IEEE Today (3)

- The 400,000 members of IEEE reside in more than 160 countries; more than 50 percent of members are from outside the United States.
- **More than 107,000 student members (!).**
- There are 333 sections in 10 worldwide regions.
- More than 2,100 chapters unite local members with similar technical interests.
- **There are 2,173 student branches at colleges and universities in 80 countries, and 585 student branch chapters of IEEE technical societies.**



IEEE Societies

- **Societies of the IEEE each support a specific part of the profession.**
- **They generally have annual (or more often) conferences and meetings.**
- **Most have one or more monthly publications that cover topics relevant to the discipline, typically new technical advancements and important developments in the professional area.**
- **Such a society is the IEEE Computer Society, of which your instructor is a member.**



IEEE Societies

- **IEEE Aerospace and Electronic Systems Society**
- **IEEE Antennas and Propagation Society**
- **IEEE Broadcast Technology Society**
- **IEEE Circuits and Systems Society**
- **IEEE Communications Society**
- **IEEE Components, Packaging, and Manufacturing Technology Society**
- **IEEE Computational Intelligence Society**
- **IEEE Computer Society**
- **IEEE Consumer Electronics Society**
- **IEEE Control Systems Society**
- **IEEE Dielectrics and Electrical Insulation Society**
- **IEEE Education Society**
- **IEEE Electron Devices Society**
- **IEEE Electromagnetic Compatibility Society**
- **IEEE Engineering in Medicine and Biology Society**
- **IEEE Geoscience and Remote Sensing Society**
- **IEEE Industrial Electronics Society**
- **IEEE Industry Applications Society**
- **IEEE Information Theory Society**
- **IEEE Instrumentation and Measurement Society**
- **IEEE Intelligent Transportation Systems Society**
- **IEEE Magnetics Society**
- **IEEE Microwave Theory and Techniques Society**
- **IEEE Nuclear and Plasma Sciences Society**
- **IEEE Oceanic Engineering Society**
- **IEEE Photonics Society**
- **IEEE Power Electronics Society**
- **IEEE Power and Energy Society**
- **IEEE Product Safety Engineering Society**
- **IEEE Professional Communications Society**
- **IEEE Reliability Society**
- **IEEE Robotics and Automation Society**
- **IEEE Signal Processing Society**
- **IEEE Society on Social Implications of Technology**
- **IEEE Solid-State Circuits Society**
- **IEEE Systems, Man, and Cybernetics Society**
- **IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society**
- **IEEE Vehicular Technology Society**



IEEE Computer Society

- **With nearly 85,000 members, the 64-year-old IEEE Computer Society is the world's premier organization of computing professionals, offering publications, standards, certifications, conferences, and more.**
- **The society sponsors an annual conference that includes workgroup seminars, new-technology tutorials, and conference sessions on many areas of computer technology.**
- **The annual conference is jointly sponsored with the ACM (Association of Computing Machinery, a CS organization).**



IEEE CS Educational Opportunities

- **Books**
- **Certifications & Training**
- **Conference Publications**
- **Conferences**
- **Digital Library**
- **eLearning Campus**
- **Free Newsletter**
- **Journals**
- **Magazines**
- **Newsfeed**
- **Computing Now**
- **Computer.org Main Page**
- **Free Newsletter**
- **Jobs Center**
- **New Media Center**



ISCA 2012

- **The 39th International Symposium on Computer Architecture (ISCA) is the premier forum for new ideas and experimental results in computer architecture. This year's workshops:**
 - **Workshop on Applications for Multi and Many Core Processors**
 - **Workshop on Architectures and Systems for Big Data**
 - **Workshop on Energy-Efficient Design**
 - **Workshop on Architecture Competitions and Memory Scheduling**
 - **Workshop on Architectural and Microarchitectural Support for Binary Translation**
 - **Dark Silicon Workshop**
 - **Workshop on Duplicating, Deconstructing and Debunking**
 - **Second Workshop on Future Architectural Support for Parallel Programming**
 - **Second Workshop on the Intersections of Computer Architecture and Reconfigurable Logic**



IEEE/Societies

- **Notice that the entire focus of both IEEE and its component societies is continuing education.**
- **Professional and technical societies like IEEE recognize that the only electrical engineering professional that will continue to hold a high-paying and satisfying job is the one who continuously upgrades and improves his technical skills.**
- **Membership in IEEE is a key component in an EE's plan to continue in a personal program of knowledge upgrade and skills improvement. Plan to join it and the society that corresponds to your technical specialty.**



Activities of Local IEEE Chapter in Dallas

- **The local Dallas IEEE chapter has many and varied activities designed to keep the average member up-to-date on technical news of interest and also information on business and local news which may influence the practice of engineering or the job of local members.**
- **The following slide shows the most recent weekly email distributed by the Dallas IEEE section concerning meeting activities and other events of interest.**



Activities of Local IEEE Chapter in Dallas (2)

IEEE Dallas Section Activities - Week September 16

All events listed on [Dallas Section Events Calendar](#) as of September 15. Check [Events Calendar](#) for recently added events.

- IEEE-CVT Technical Luncheon: [Supporting Wireless Video Growth](#) Tuesday, September 17, 2013, 11:30pm - 1:00pm
- IEEE RS Reliability Society: [Battery Health Monitoring and Prognostics](#) Friday, September 20, 2013, 3:45pm - 5:00pm
- Heroes of Discovery Lecture Series: [Wednesday, September 25, 2013, 6:00pm - 8:00pm](#)
- IEEE Women in Engineering: [Online Live Chat](#) Friday, September 27, 2013, 10:00am - 11:00am
- IEEE Women in Engineering: [Online Live Chat](#) Friday, October 4, 2013, 10:00am - 11:00am
- IEEE MetroCon: [\(more info\)](#) Wednesday, October 9, 2013, 7am - 7pm
- IEEE EMBS: [2013 IEEE Texas Medical Device Symposium](#) Thursday, November 7, 2013, 7:45am - 8:30pm

Announcements

- IEEE President Election: [\(Vote now! Last day to vote: October 1st 12:00pm CT\)](#)
- BEST Robotics Mentors and Volunteers Needed: [\(more info\)](#)
- IEEE Standards Event for Students & University Faculty: [\(more info\)](#)
- 30th Southern Biomedical Engineering Conference 2014: [\(more info\)](#)
- On Line Chats for Women in Engineering: [\(more info\)](#)
- Value of IEEE membership: [\(more info\)](#)

Section Sponsor: [Experis](#)

Thanks,

Greg Breiland, greg.breiland@ieee.org



IEEE at UTD

- There is an active IEEE student chapter at UTD. **The 2012-2013 chairperson of the UTD chapter, Andres Zevallos, gave me the following student chapter IEEE statistics*:**
 - Over 800 on current mailing list.
 - About 50-70 members attend monthly meetings. Meetings frequently **HERE in ECSS 2.415.**
 - They have a website, but it is not as up-to-date as the chapter Facebook page:
<https://www.facebook.com/IEEEUTD>.

*As of spring, 2013.



Fall Meetings of Student Chapter

Date	Time	Subject	Location
Sept. 23	8:15 PM	Research showcase at UTD—several UTD engineering professors will discuss their research.	ECSS 2.415
Oct. 14	7:00 PM	Intel Recruiting session. Pizza will be served!	ECSS 2.415
Oct. 21	TBD	Tech talk. Subject and presenter to be announced	TBD
Nov. 4	TBD	AT&T presentation	TBD
Nov. 18	TBD	Social event, to be announced	TBD
Dec. 2	TBD	Tech talk. Subject and presenter to be announced	TBD



Special Events

- **Special events will be arranged during the year, in addition to the meetings. Some prior events :**
 - **Robotics Session: A special push to add members to The Robotics Society (now part of IEEE).**
 - **Election: New officers are elected for in the spring. One of the new officers this year was from last year's EE 1202 class (!).**
 - **The IEEE student chapter website was revamped.**
 - **Volunteers from the IEEE student chapter assisted in the Open House celebrating the 25th Anniversary of the Jonsson school. IEEE members gave lab tours to area high school students.**



Current IEEE Officers

- **Kenny Livingston, Chair:**
kal104020@utdallas.edu
- **Zach Stokes, Vice-Chair:**
zach.stokes1@gmail.com
- **Kristen Villemez, Treasurer:**
kristen.villemez@gmail.com
- **Alec Burmania, Secretary:**
alecburma@gmail.com
- **Anubha Vashistha, Publicity:**
axv109120@utdallas.edu
- **Ryan Baumann, Tutoring:**
baumanrm@yahoo.com



IEEE Chapter-Related Websites

- **Org Sync Website:**
<http://utdallas.orgsync.com/org/ieeeutd>
- **Facebook:**
<https://www.facebook.com/IEEEUTD>
- **Google Groups:**
<http://groups.google.com/group/ieee-utd-members>



How to Join IEEE

- **To official join the IEEE National Organization go to this website:**
http://www.ieee.org/membership_services/membership/join/index.html
- **Follow instructions to join the IEEE. Full membership for a student is \$32/year, a real bargain.**
- **Note that you DO NOT have to join the IEEE to attend student chapter meetings. Membership in the local chapter is free to students.**



Some Other Educational Opportunities

- **As mentioned earlier, there are other sources of learning available to the practicing engineer.**
- **These include other universities, technical proficiency schools, for-profit schools and certification organizations, and volunteer groups.**
- **A few of these other sources are discussed in the following slides.**



The Center for Lifelong Learning

- **The Center for Lifelong Learning is a resource for graduate engineers who need to update skills, associated with The University of Texas at Austin (<http://lifelong.engr.utexas.edu/index.cfm>).**
- **Although it covers all engineering professions, it includes EE, and also has an ethics course.**
- **The center stresses education for working engineers, although it also offers masters programs in EE areas as well.**
- **Notably, it also offers a master's in engineering management.**



Certification and Skill Upgrade Schools

- In addition to higher education institutions, there are also commercial, for-profit companies that specialize in engineering education, re-education, and skill upgrades.
- Once you become a registered engineer in Texas (or wherever you choose to work), you will be inundated with offers from such companies to support your continued learning.
- One such company is RedVector.

Other Resources (2)



- **RedVector is a for-profit on-line source that sells learning modules that can be purchased for home education.**
- **They tend to emphasize mechanical and civil engineering, but do have some EE courses.**
- **They have an excellent ethics module, which I have purchased and used to complete by State-of-Texas annual licensed professional engineer ethics learning update.**
- **They also have courses in engineering management and technical leadership.**



Lifelong Learning Assignment

- Attend tonight's IEEE student meeting and join the student chapter. Attendance will be taken. This is a mandatory EE 1202 assignment.
- You must also attend at least three more of the IEEE student chapter meetings before the end of the semester.
- You can also volunteer for and be involved in one other activity with the student chapter. This could replace going to one of the meetings. **Must show proof of participation!**
- **You are heavily encouraged to remain involved with the IEEE at UTD for the rest of your UTD career.**



Joining IEEE

- **You are encouraged to become a student member of the IEEE organization.** This can be an important component of a long and productive career in electrical engineering.
- **Student membership, as mentioned earlier, is \$32.**
- **After you join, search the IEEE website for the “IEEE Code of Ethics.” Print out a copy.**
- **Write a one-page paper on “being an ethical engineer.” Staple copies of the code, your membership card, and your essay together and turn in as a bonus assignment.**
- **Bonus for participation in this assignment : +10 points (= 1 letter grade!) added to your final grade in EE 1202.**



IEEE Bonus

- **To repeat:**
 - **Join IEEE**
 - **Go to the IEEE website and print out the IEEE code of ethics.**
 - **Write a one-page essay on “what it means to be an ethical engineer.”**
- **To earn your bonus, turn in three things:**
 - **A copy of your IEEE membership card.**
 - **A copy of the IEEE code of ethics (can print off the web site).**
 - **Your essay.**
- **Bonus: +10 points added to your final grade.**