

Skills and Knowledge (S&K) Useful in the Workforce (Revision 1.0 4/21/2017)

- I. *Engineering*
Use fundamental concepts and solve problems that cut across multiple areas of electrical engineering; take on problems that link electrical engineering with other fields; become familiar with how electrical engineering concepts are used in modern technology; understand the need for and know how to work with industry technical standards.
- II. *Concomitant Technical Skills*
Learn how to solve ill-defined problems via experimentation, simulations and model-building; identify follow-on investigations and necessary resources; achieve competency in instrumentation, computation, industry-standard software, coding and data analysis; understand how your solution fits into the larger system.
- III. *Communication Skills*
Develop the ability to communicate orally and in writing to audiences with diverse technical and non-technical backgrounds; develop the habit of listening, influencing, mentoring and assessing understanding.
- IV. *Professional Skills*
Seek to work in diverse teams and generate new ideas; multiply individual effectiveness by developing the appropriate professional and social networks; demonstrate ability to understand and apply workplace concepts and practices related to problem definition, statements of work, project management, scheduling, budgeting, business acumen, intellectual property, safety and legal/regulatory issues; learn how to discern and integrate into the company culture; develop the habit of creating value for customers (internal and external); demonstrate life skills such as responsibility, honesty, perseverance, time-management, cultural sensitivity, mutual respect and ethical behavior.

Recommendations to the ECE Department to Instill the Above Skills and Knowledge into Its Program. (Revision 1.1 6/15/2018)

1. Use industry trends to steer strategic planning of curriculum, extracurricular programs, and student recruiting. Focus hiring and faculty development, course modifications, enhanced program requirements and co-curricular activities that emphasize contact between students and faculty with engineers outside academia and expose them to electrical engineering as applied outside academic settings (Addresses S&K I, IV).
2. Utilize co-curricular activities such as co-ops and student internships, community resources such as economic development organizations and industry speakers and guests to expose students to opportunities as well as to business and professional skills (Addresses S&K I, II, IV).
3. Through advising, assist students in identifying career paths and direct students to courses and programs that directly support their career objectives (Addresses S&K I).
4. Provide global and cross-cultural perspectives through experiences that promote involvement with globally complex issues in unfamiliar environments, such as spending time abroad (Addresses S&K IV).
5. Build industry partnerships, add industrial projects to the research agenda, and utilize sabbaticals and other opportunities to provide faculty with exposure to the needs and challenges of non-academic organizations (Addresses S&K I, IV).

6. Promote a department and faculty culture that understands current and future trends in non-academic careers in ECE and the students that pursue them and which emphasizes innovation and an entrepreneurial mindset . (Addresses S&K IV)
7. Incorporate application-related topics and industry-standard software and tools in courses, exercise assignments and lab activities (Addresses I, II).
8. Collaborate with other academic departments (biology, medicine, chemistry, physics, business, environmental science, etc.) and campus offices to bring workplace-relevant topical content and experience to engineering students (Addresses S&K II, IV).
9. Expand written and oral communications content to address diverse, technical as well as non-technical audiences (Addresses S&K III).
10. Develop interdisciplinary research, projects, and teaching opportunities that feature authentic experiential learning with clients and mentors that include interdisciplinary experience in fields such as public policy, business, law, medicine, ethics, and communications. Leverage existing capabilities on campus (Addresses S&K I, II).
11. Develop social consciousness through service-learning such as problem-based community projects that foster an appreciation of the impact of engineering and its role in serving human welfare and the needs of society (Addresses S& K I, IV).
12. Emphasize, develop, facilitate, measure, and reward teaching excellence. Harvest research results in engineering education and online learning and make them available to the teaching faculty. Use experts in the UH College of Education as consultants. (Address S&K I, II)
13. Benchmark the universities that have achieved high female ECE graduation rates. Port tactics to UH where applicable. Conduct training of students during orientation on professional behavior and coping skills; refresh the training at the beginning of the Capstone Projects. Establish a vigorous outreach program that features female ECE students interacting with early middle school students. (Addresses S&K IV)

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