ATTACHMENT B

CURRICULUM CHANGE PROPOSAL

To: Curriculum Committee

From: Department of Electrical Engineering

Date Submitted: September 30, 2008

Type of Curriculum Change Requested: Addition of new option

Submitted By: Carl Greco

Approved By: Department Head: Matthew E. Nelson 10/1/08

Dean of School: Willy Haeffler

Reviewed By: Registrar: Tammy Quade

Vice-President for Academic Affairs: _____

I. Program or curriculum change as it will appear in the catalog.

(see page 3 of this Attachment)

11-24-08 KR

II. Course Information

A. *Rationale for the requested change.*

The Computer Engineering (CE) option in Electrical Engineering will provide the educational background for engineers to work in an integrated hardware and software design and development cycle in a variety of industries from aerospace to medical systems.

B. *What impact will the change have on staffing, on other programs, budget, and space allocation?*

1. *Within the department requesting the change.* The Computer Engineering option will require minimal additional resources. There are no additional courses, space allocation nor additional staffing required. The anticipated increased number of engineering students will produce a minimal increase in the class sizes which would be expected to be adequately accommodated within existing courses without any additional sections. The additional overhead required to administer the CE option will not be excessive.

2. *Outside the department.* The Computer Engineering students will increase the class sizes in the Computer Science courses in common with in the CE curriculum. These additional CE students are not anticipated to be sufficient to increase the staffing, space allocation nor number of sections offered in the required Computer Science courses within the CE curriculum.

app CC 10/24/08
app FS 11/12/08

C. *Effective date or term.* Fall 2009.

D. ***When applicable, state with which departments you have specifically coordinated this change? (If unable to identify coordinating departments that change affects, Academic Affairs can offer assistance in identifying course use.)*

List Department Head/ Program Director Consulted: (Add to list as needed)	Indicate Support for Proposal (yes/no)	Date:
1. Ron Robison, Computer and Information Science	yes	9/10/08

No new courses are required for the Computer Engineering option. The courses currently offered by the Electrical Engineering and the Computer and Information Science Departments meet the curriculum recommended by the Joint IEEE Computer Society / ACM Task Force [2].

Each new program proposal must include an assessment plan using the approved University Assessment Form.

A program outcomes and assessment plan is attached.

*Updated 8/1/04
**Updated 9/1/05

Outline in specific detail how your proposal will alter the program (include course number and title): The proposed Computer Engineering curriculum will not alter the courses currently offered in Electrical Engineering or Computer Science.

Catalog Statement for Department of Electrical Engineering:

The Department of Electrical Engineering offers a four-year program leading to the Bachelor of Science in Electrical Engineering (BSEE) degree. This program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET). The computer engineering option was added in 2009-2010.

The mission of the Department of Electrical Engineering at Arkansas Tech University is to maintain an accredited program leading to the Bachelor of Science degree. The Department is committed to providing its students with a positive atmosphere in which to learn the fundamentals of engineering practice including engineering science and design. In order to fulfill its mission, the Department has established the following educational objectives.

Engineers who graduate from Arkansas Tech University with a BSEE degree will be:

1. Intellectuals - with a commitment to ethics, social and environmental responsibility, and lifelong learning.
2. Team Players - communicating, planning, coordinating, and managing projects and personnel with efficiency and effectiveness.
3. Problem solvers - learning new concepts, techniques, skills, and tools to aid in analyzing and designing electrical and computer engineering systems.
4. Professionals - trained and competent in the fundamentals of engineering science, applied mathematics, laboratory practice, and principles of electrical and computer engineering.

The first two years of curriculum contain the needed mathematics, science and engineering science basics to prepare the student for the upper level electrical and computer engineering courses. The junior and senior years include 12 hours of electives (6 for the computer engineering option) which allow students to concentrate their studies in an area of specialization such as electric power, computers, robotics, or communications.

Prior to enrolling in any 3000 or 4000-level engineering courses, students must successfully complete a pre-professional curriculum containing preparatory courses normally taken during the first three semesters. The pre-professional curriculum is composed of the following courses:

- ENGL 1013 and ENGL 1023 (or equivalent)
- MATH 2914 and 2924
- CHEM 2124
- PHYS 2114

Satisfactory completion of the pre-professional curriculum is defined as a grade of "C" or better in each course. Students should meet with their advisor during the semester in which they anticipate completing the pre-professional curriculum to complete the procedure for admittance to upper-level engineering courses.

The following curriculum represents the program of study and a suggested sequence for the Bachelor of Science in Electrical Engineering degree. The student should be aware that not all courses are offered each semester and that the ordering of courses is subject to change. In order to minimize scheduling difficulties, each student should schedule a special session with their advisor at the beginning of their junior year to plan the remaining coursework.

The existing Bachelor of Science in Electrical Engineering curricula for Fall and Spring admittance will remain unchanged. The proposed additional Computer Engineering option Fall/Spring curricula follow:

FALL START

Course Name	Course Number	Credits		Course Name	Course Number	Credits	
First Semester				**Second Semester**			
Intro Engr	ELEG 1012	2		Digital Logic Des	ELEG 2134	4	
Foundations I (C++)	COMS 2104	4		Digital Logic Lab	ELEG 2130	0	
Engl Comp I	ENGL 1013	3		Engl Comp II	ENGL 1023	3	
Calculus I	MATH 2914	4		Calculus II	MATH 2924	4	
Biological Sci	-	4		Foundations II (C++)	COMS 2203	3	
			17	PE	-	1	15
Third Semester				**Fourth Semester**			
Elec Circuits I	ELEG 2103	3		Elec Circuits II	ELEG 2113	3	
Fine Arts	-	3		Elec Circuits Lab	ELEG 2111	1	
Social Science	-	3		Chem	CHEM 2124	4	
Diff Eq	MATH 3243	3		Calculus III	MATH 2934	4	
Phys I	PHYS 2114	4		Phys II	PHYS 2124	4	
			16	PE	-	1	17
Fifth Semester				**Sixth Semester**			
Electronics I	ELEG 3103	3		Electronics II	ELEG 4103	3	
MicroProc Sys Des	ELEG 3133	3		Electronics Lab	ELEG 3131	1	
Engr Modeling & Design	ELEG 3003	3		Computer Organization	COMS 2223	3	
Discrete Structures	COMS 2903	3		Signals and Systems	ELEG 3123	3	
Applied Statistics	MATH 3153	3		Data Structures	COMS 2213	3	
Humanities	-	3	18	Electromagnetics	ELEG 3143	3	16
Seventh Semester				**Eighth Semester**			
Engineering Design	ELEG 4202	2		Econ	ECON 2003	3	
Soc Sci	-	3		Operating Systems	COMS 3703	3	
Communications I	ELEG 4143	3		Social Science	-	3	
Digital Signal Proc	ELEG 4113	3		Senior Design Proj	ELEG 4193	3	
Control Systems	ELEG 4303	3		Engr Elective	-	3	
Adv Digital Design	ELEG 4133	3	17				15
					Total		131

SPRING START

Course Name	Course Number	Credits	
First Semester			
Intro Engr	ELEG 1012	2	
Fine Arts	-	3	
Engl Comp I	ENGL 1013	3	
Calculus I	MATH 2914	4	
Biological Sci	-	4	
			16
Second Semester			
Digital Logic Des	ELEG 2134	4	
Digital Logic Lab	ELEG 2130	0	
Engl Comp II	ENGL 1023	3	
Calculus II	MATH 2924	4	
Foundations I (C++)	COMS 2104	4	
PE	-	1	16
Third Semester			
Elec Circuits I	ELEG 2103	3	
Foundations II (C++)	COMS 2203	3	
Social Science	-	3	
Diff Eq	MATH 3243	3	
Phys I	PHYS 2114	4	
			16
Fourth Semester			
Chem	CHEM 2124	4	
Elec Circuits Lab	ELEG 2111	1	
Elec Circuits II	ELEG 2113	3	
Calculus III	MATH 2934	4	
Phys II	PHYS 2124	4	
PE	-	1	17
Fifth Semester			
Computer Organization	COMS 2223	3	
MicroProc Sys Des	ELEG 3133	3	
Signals and Systems	ELEG 3123	3	
Discrete Structures	COMS 2903	3	
Applied Statistics	MATH 3153	3	
Electromagnetics	ELEG 3143	3	18
Sixth Semester			
Electronics I	ELEG 3103	3	
Humanities	-	3	
Engr Modeling & Design	ELEG 3003	3	
Data Structures	COMS 2213	3	
Soc Sci	-	3	
Communications I	ELEG 4143	3	18
Seventh Semester			
Engineering Design	ELEG 4202	2	
Operating Systems	COMS 3703	3	
Econ	ECON 2003	3	
Electronics II	ELEG 4103	3	
Engr Elective	-	3	
Electronics Lab	ELEG 3131	1	15
Eighth Semester			
Digital Signal Proc	ELEG 4113	3	
Control Systems	ELEG 4303	3	
Social Science	-	3	
Senior Design Proj	ELEG 4193	3	
Adv Digital Design	ELEG 4133	3	
			15
		Total	131

1. Program Outcomes and Assessment

A joint task force formed by the IEEE Computer Society and the Association for Computing Machinery (ACM) defined Computer Engineering as follows:

> Computer engineering is concerned with the design and construction of computers and computer-based systems. It involves the study of hardware, software, communications, and the interaction among them. Its curriculum focuses on the theories, principles, and practices of traditional electrical engineering and mathematics and applies them to the problems of designing computers and computer-based devices.
> Computer engineering students study the design of digital hardware systems including communications systems, computers, and devices that contain computers. They study software development, focusing on software for digital devices and their interfaces with users and other devices. CE study may emphasize hardware more than software or there may be a balanced option. CE has a strong engineering flavor.
> Currently, a dominant area within computing engineering is embedded systems, the development of devices that have software and hardware embedded in them. For example, devices such as cell phones, digital audio players, digital video recorders, alarm systems, x-ray machines, and laser surgical tools all require integration of hardware and embedded software and all are the result of computer engineering. [1]

The IEEE Computer Society is the largest the society within the Institute of Electrical and Electronic Engineers with 85,000 world wide members, and the ACM is an educational and scientific society for computer professionals with more than 82,000 member world wide.

The joint IEEE Computer Society/ACM task force developed a recommended curriculum [2] which became the model for the Computer Engineering option in Electrical Engineering at Arkansas Tech University.

The level of success in reaching the Program Objectives for the Computer Engineering option is measured in the attainment of a set of Program outcomes. These outcomes serve to satisfy and support the achievement of the Program Objectives. An assessment plan has been developed to measure the level of attainment of these outcomes and has provisions for utilizing the assessment results for further improvements to the program.

The program outcomes were derived from the required outcomes stipulated by the Accreditation Board for Engineering and Technology, ABET, and additional Electrical Engineering Program criteria. The program outcomes listed in Table 2 serve as the basis for the program educational objectives in Table 1. Each program outcome in Table 2 supports the achievement of two or more program objectives and each objective is supported by several outcomes. Table 1 shows the interrelationships between program outcomes and the program educational objectives.

Table 1: Program outcomes related to program educational objectives. Outcomes are listed in Table 2.

Electrical and Computer Engineering Program Objectives	**Outcomes**	**Outcome Indicator**
Graduates from Arkansas Tech University with a BSEE degree will be:		
1. Intellectuals – with a commitment to ethics, social and environmental responsibility, and lifelong learning.	(f), (h), (i), (j)	• Employer/alumni survey • Exit interview
2. Team Players – communicating, planning, coordinating, and managing projects and personnel with efficiency and effectiveness.	(d), (g), (h), (i), (j)	• Capstone design course jury • Employer/alumni survey • Exit interview
3. Problem solvers – learning new concepts, techniques, skills, and tools to aid in analyzing and designing electrical and computer engineering systems.	(a), (b), (c), (e), (g), (k), (l), (m), (n)	• Individual course assessments • Capstone design course jury • Employer/alumni survey
4. Professionals – trained and competent in the fundamentals of engineering science, applied mathematics, laboratory practice, and principles of electrical and computer engineering.	(a), (b), (c), (e), (f), (k), (l), (m), (n)	• Individual course assessments • Professional Exam results • Employer/alumni survey

The program outcomes were established by the faculty of the Electrical Engineering Department based on the program educational objectives and input from the Engineering Advisory Board[1]. The achievement of each outcome is assessed by multiple methods under the department's assessment plan. A total of nine assessment methods have been identified by the department and each outcome is assessed by multiple methods. Table 3 shows the relationship of the assessment methods currently used by the Department for the existing program outcomes and extended to include the Computer Engineering option. Table 3 was originally developed by a committee consisting of faculty members from the Electrical Engineering Department.

1 The Engineering Advisory Board has received the a copy of the proposed Computer Engineering curriculum option.

Table 2: Electrical and Computer Engineering Program Outcomes

Electrical and Computer Engineering Program Outcomes	
The Electrical and Computer Engineering degree program will demonstrate that their graduates have:	
a.	An ability to apply knowledge of mathematics, science, and engineering.
b.	An ability to design and conduct experiments, as well as to analyze and interpret data.
c.	An ability to design a system, component, or process to meet desired needs including recognition of applicable codes and standards, economic and societal impact.
d.	An ability to function on multidisciplinary teams.
e.	An ability to identify, formulate, and solve engineering problems.
f.	An understanding of professional and ethical responsibility, including professional licensure.
g.	An ability to communicate effectively.
h.	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
i.	A recognition of the need for, and an ability to engage in lifelong learning.
j.	A knowledge of contemporary issues.
k.	An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.
l.	A knowledge of probability and statistics.
m.	A knowledge of basic sciences, computer science, and engineering sciences necessary for analysis and design of devices, software, and systems.
n.	A knowledge of advanced mathematics, including differential equations, linear algebra, complex variables and discrete mathematics.

Assessment Metrics

For each of the program outcomes in Table 2 a set of metric goals was established to allow the department to measure the level of attainment of each of the outcomes by the department's graduates. Not all assessment methods have metric goals for each outcome. The goals established are, primarily, external measures that are not directly related to a student's grade in a particular course. External measures used in establishing these assessment goals include such items as student scores on a professional certification exam, exit interviews conducted with graduating seniors, alumni and employer surveys and other statistics related to the program's graduates.

The computer engineering option students will be required to take the Fundamentals of Engineering practice exam which is administered by Professional Publications, Inc. (PPI) [3]. The content of the PPI exam is customizable and can be scheduled at any time during the year which is convenient for the student and the department. Students take the exam online with test results returned to the student and the department.

Exit interviews, conducted by the department head, are held with each graduating senior. These interviews take the form of a survey questionnaire, but are normally conducted orally with the student. In the past, greater than 90% participation rate has been achieved on the exit interviews.

Alumni and employer surveys are conducted on a regular basis in accordance with the assessment plan. The last such survey was mailed to students who had graduated since the establishment of concentration areas within the Bachelor of Science in Engineering degree.

Other internal measures used in establishing metric goals for the program outcomes include faculty ratings of achievement of course technical objectives and ratings on senior design project reports and presentations.

The achievement of these metric goals illustrates the level of attainment of the program educational objectives. Although a expected high success rate in achievement of the metric is the goal, it is realized that it may not be a practically obtainable result in any given year. However, setting the goals to this lofty level provides a target for improvement for the department and its programs.

Assessment Data

The assessment measures used by the department are listed in Table 3. Each of these measures is discussed together with the assessment data gained from each.

Fundamentals of Engineering (FE) Practice Exam – Unlike the Fundamentals of Engineering Exam administered biannually by the Arkansas Board of Registration for Professional Engineers and Land Surveyors, the FE Practice Exam from Professional Publications, Inc. [3] can be scheduled for the convenience of the student. The FE exam is voluntary and not all students choose to take it. The FE Practice exam administered by PPI will be require for all students in their senior year. The PPI exam results provide detailed performance scores for resolution down to the individual question level which are not available for the FE exam. In addition, the PPI exam content can be customized to include topics within a specific degree option. The target score for the assessment metric is 85 percent average exam score for all students with no individual student scores below 60%.

Coursework Technical Objectives – A list of technical objectives is maintained for each course taught in the Electrical Engineering and Computer and Information Science departments. At the end of each semester, faculty make an overall assessment of how well each class met the objectives for their individual courses. These scores, rated on a 1 (low) to 5 (high) scale, are recorded in a database for each course and semester. All course technical objectives are linked to departmental educational objectives. The target metric for assessment will be an average score of 4 for all courses with no individual course below a score of 3. As an example, see the objectives for ELEG 2134 and COMS 2213 in the appendices.

Team Projects – The assessment of student outcomes related to teamwork is carried out primarily by input from courses and projects that require teams of two or more students. The department continues to provide students with a number of team project opportunities. A project grade constitutes a major contribution to the overall course grade in a number of courses. The teamwork assessment will be developed at two levels. A comprehensive assessment will be comprised of both a self-assessment performed by each team member as well as a faculty supervisor assessment for each team. Since this level of assessment is not feasible or practical for each laboratory and project oriented course, it will be

applied to the senior design projects. The target metric will be an average rating of 4 for all teams. See attached self assessment teamwork questionnaire. Teamwork within other project and laboratory courses will be assessed under coursework objectives.

Laboratory Coursework – Assessment data from laboratory coursework is composed primarily of student performance in laboratory courses. Laboratory coursework will be assessed under the coursework objectives listed above.

Senior Design Projects – Assessment of Senior Design Projects is carried out in three levels. A committee composed of all available faculty members submits comments on project final reports and presentations to the faculty member assigned the Senior Design course. A Senior Design Committee reviews all projects and makes an assessment of the level of achievement of the technical objectives for each project. Finally, the faculty member responsible for the course assigns grades for the course, taking into account the above listed input from other faculty members. In addition to the assessment metrics already covered, the faculty review committee will find that 90% or greater of the projects met or exceeded their design goals.

Exit Interviews – The Electrical Engineering Department Head conducts Exit Interviews each semester with graduating seniors. These interviews are voluntary, but a 90% (or greater) participation rate has been achieved over the past several semesters in the electrical engineering program. A number of metric goals in the outcomes assessment (Table 3) are linked to this exit interview. Students are asked to rate the program and the knowledge they acquired on a scale of 1 to 5 where is strongly agree. The topic rated are listed in the appendices. The target metric for the exit interview is average rank of 4 for all students.

Enrollment in Graduate School – Enrollment in graduate school is another assessment method that is used sparingly as a metric goal. The department has established a goal that 10% of graduating students apply for graduate school and 100% of those applying will be accepted.

Alumni Surveys – Surveys will be sent to all program alumni who have graduated within the previous ten years. The assessment metric will be that 80% of the graduates will be employed in their discipline and of those graduates who are employed within their area of study 90% will indicate that their educational training provided the required training, information and knowledge for their jobs.

Employer Surveys – An employer survey will be included with each of the alumni surveys noted above. The assessment metric will be that 100% of all employers will, given the opportunity and need, hire another graduate from the computer engineering program.

Table 3: Methods used to assess student outcomes. The capital "X" represents a directly measurable results where the lower case "x" may be inferred.

	Methods Used to Assess Student Outcomes	Electrical and Computer Engineering Outcomes													
		a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**	**l**	**m**	**n**
1	F.E. Practice Exam [3]	**X**				**X**	**X**					x	**X**		**X**
2	Coursework Tec.nical Objectives	**X**	**X**	**X**		**X**		x				x	**X**		**X**
3	Team Projects	x		x	**X**			x							
4	Laboratory Coursework	x	**X**	**X**	x	x		**X**				**X**			
5	Senior Design Projects	**X**	**X**	**X**	**X**	**X**		**X**			**X**	x		**X**	x
6	Exit Interviews	x	x	**X**	x	**X**	**X**	x	**X**	**X**	**X**	x	x		
7	Enrollment in Graduate School	x	x	x		x		x		x		x		x	x
8	Alumni Surveys	**X**	**X**	**X**	**X**	x	x	x	**X**	**X**	**X**	**X**		**X**	
9	Employer Surveys	x	x	x	**X**	x	**X**	**X**	**X**	x	x	**X**	x	**X**	

2. Endorsement

Date: 9/11/08
From: Mike Hill (MikeHill@decraneaerospace.com)
Hello Carl,
Thank you for contacting me. I do see a need for this type of education and I encourage ATU to move forward with this degree. In my field of work, it would be very beneficial to have an engineer that could perform a design around a processor that can run open source Linux and allow development with the open source tools. ARM processors are the big thing now and many of the media processors are dual core with an ARM and a DSP. Most, if not all, of the processors from companies like Freescale, Texas Instruments, ADI, Atmel, etc. will have a Board Support Package for Linux.

uClinux has ports for Coldfire, DragonBall, Blackfin, ARM, etc. I can see these being very useful for a student design project. If you are interested, here is a link:

http://www.uclinux.org

I'm not just advocating Linux. Embedded platforms like WinCE, Windows Mobile, and Windows XP Embedded are also very pertinent to these applications, but these platforms can be cost prohibitive.

You can probably tell from my email that I'm focused mostly on Media processing and Operating Systems for smaller, mobile devices, but that is where processing is at in today's market. Ethernet, USB, and wireless interfaces are the big thing for portable media devices, and in the home, with the advent of digital television and shared media, media processing is huge. Consumers want to be able to take their media stored at a single location and distribute that to the whole house. Powerful processing, but small form factor is required.

I see us losing our competitive edge as a country, with a lot of engineering being outsourced to China and India. I would very much like to see this change and to see our students getting more involved in video processing, which is definitely an application related to computer engineering, because of the processors that must be used.

Please let me know if I can be of any assistance to you.

Best Regards,

Mike Hill
Electrical Engineering Group Leader
Decrane Aerospace - Audio International
501.801.8147 office
501.765.1120 cell

References:

1) Computing Curriculum 2005, The Overview Report, The Joint Task Force for Computing Curricula 2005, September 2005, [http://www.computer.org/portal/cms_docs_ieeecs/ieeecs/education/cc2001/CC2005-March06Final.pdf].
2) Computer Engineering 2004, Curriculum Guidelines for Undergraduate Degree Programs in Computer Engineering, Joint Task Force on Computer Engineering Curricula, December 2004, [http://www.computer.org/portal/cms_docs_ieeecs/ieeecs/education/cc2001/CCCE-FinalReport-2004Dec12-Final.pdf]
3) Professional Publications, Inc., Exam Cafe [http://ppi2pass.com/ppi/ECMain].

Appendix:

ELEG 2134/2130 Digital Logic Design Technical Objectives and Assessment Criteria:

1. Ability to use and convert between different number systems including binary, hexadecimal and octal. [1][2]
2. Ability to apply Boolean algebra to digital system.
3. Development of combinational design techniques at the gate and medium-scale integration (MSI) level. [1,3]
4. Development of sequential logic design techniques at the gate and MSI level. [1,3]
5. Introduce the student to digital electronic hardware design at the medium and large scale integrated circuit level using a Hardware Description Language, for example VHDL or Verilog. [1, 3]
6. Preparation of formal written lab reports. [1,2,3]

COMS 2213 Data Structures

At the conclusion of the course the student will be able to:

1. Design, write and test programs using lists, stacks, queues, and binary search trees.
2. Employ advanced features of programming languages such as templates, classes, inheritance, polymorphism and operator/function overloading.
3. Analyze the running time of typical O(n) and O(n**2) algorithms.

Team self assessment topics rated from 1 to 5 with 1 – disagree and 5 – full agreement.

1. Team mission and purposes are clear and consistent; attainable.
2. Team mission addresses the customer's needs.
3. Respect has been built within the team for diverse points of view.
4. Team environment is characterized by honesty, trust, mutual respect, and team work.
5. Team objectives are challenging and the work is necessary.
6. Team climate is comfortable and relaxed; there are no obvious tensions or signs of boredom.
7. There is little evidence of conflict between team members.
8. Team treats every member's ideas as having potential value.
9. Team encourages individual differences.
10. Conflicts within the team are dealt with swiftly and resolved to satisfaction of those involved.
11. Team members are open and non-confrontational when communicating among themselves.
12. Team process stimulates creativity and brings fresh perspectives to problems.
13. Team takes time to develop consensus by discussing the concerns of all members to arrive at an acceptable solution.
14. Other class members (outside of my team) have a high level of trust and confidence in the team.
15. Team performance is evaluated fairly and on an ongoing timely basis.
16. Our team has a cooperative climate – team members supporting each other and working together to pursue mutual goals and also confident about speaking their minds and expressing opinions.
17. The Team Director provides clear roles and work assignments.
18. Team Director deals with dysfunctional behavior in an appropriate manner.

Exit interview questions used in assessment rated from 1 to 5 with 1 – strongly disagree and 5 – strongly agree:

1. I feel that my Tech education has been sufficiently broad to allow my understanding of the impact of engineering solutions on society.
2. I feel that I can design a component or system.
3. My engineering education has provided me an understanding of professional ethics and responsibility.

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2 Refers to the number of the educational objective(s) of the program leading to the BSEE degree at Arkansas Tech University that applies to course objective.

4. As my career develops, I recognize a need to continue my education through professional development courses or advanced studies.
5. I feel that my education has given me an appreciation for contemporary issues.
6. I feel that my education has prepared me to be able to formulate and solve problems as needed for my job.
7. I am familiar with professional engineering registration (EIT and PE license).
8. Overall, I am pleased with the quality of education provided in Electrical Engineering.