

Program Modification Proposal

Proposing Institution: South Carolina State University

Program Title: Bachelor of Science in Electrical Engineering Technology
at Aiken Technical College

Date of Submission: April 30, 2008

Program Contact Information:

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Leonard McIntyre
President

April 30, 2008
Date

Classification

Program Title: Bachelor of Science in Electrical Engineering Technology (BSEET) at Aiken Technical College

Academic unit involved: Department of Industrial and Electrical Engineering Technology
College of Science, Mathematics and Engineering Technology

Designation, type, and level of degree: Bachelor of Science in Electrical Engineering Technology (4 year program) awarded by South Carolina State University at Aiken Technical College, Graniteville, South Carolina 29829.

Proposed date of implementation: Fall 2008

CIP Code: 150303

Program type: Program Modification

Site: Aiken Technical College, Graniteville, South Carolina 29829

Program Qualifies for Supplemental Palmetto Fellows Scholarship and LIFE Scholarship Awards Yes: X No: _____

Delivery mode: Traditional in the evening

Justification

The objective of this program is to offer a Bachelor of Science degree in Electrical Engineering Technology to students from Aiken Technical College (ATC) through a comprehensive transfer program. This transfer program will allow the students who complete their Associate degree in Engineering Technology majoring in Electronics Engineering at ATC to transfer a majority of their courses into the matching South Carolina State University (SCSU) Electrical Engineering Technology degree, provided the university and the program guidelines are satisfied.

There is a shortage of engineers in the state and in the nation as a whole. According to the Department of Labor's Bureau of Labor Statistics' (BLS) 10-year (2002-2012) employment forecast, the demand for technical workforce and engineering managers is expected to grow by 13.4% and 13% respectively. These numbers will increase, without any doubt, due to declining enrollment in Engineering Technology programs nationwide. This initiative will help meet the growing demand for technical workforce as well as the growing interest among two-year technical college graduates across the State of South Carolina to pursue a BS degree in Electrical Engineering Technology—a lack of which will hinder their upper mobility.

Implementing this program in response to professional and technological demands is consistent with the institutional goals of SCSU. South Carolina State University currently offers similar programs at the University Center, Greenville, South Carolina and at Piedmont Technical College, Greenwood, South Carolina. The institutions geographically closest to South Carolina State University that offer similar programs are: Georgia Southern University, Georgia; Savannah State University, Georgia; Southern Polytechnic State University, Georgia; University of North Carolina at Charlotte, North Carolina and Western Carolina University, North Carolina. South Carolina State University is the only tertiary level institution in the state of South Carolina that offers a BSEET.

Enrollment

Entry into this program will require the completion of an Associate degree in Engineering Technology from Aiken Technical College or equivalent degree from another technical college. The students interested in the BSEET degree will be accepted through a comprehensive transfer program per the transfer credit course guide on page 4.

PROJECTED TOTAL ENROLLMENT						
Year	Fall		Spring		Summer	
	Headcount	Credit Hours	Headcount	Credit Hours	Headcount	Credit Hours
2008-2009	5	30	5	30	5	30
2009-2010	10	90	10	90	10	60
2010-2011	15	150	15	150	15	90
2011-2012	18	180	18	180	18	108
2012-2013	20	200	20	200	20	120

This program will start with 5 students. We have documented interest from these students. The program is expected to grow to 15-20 students per year. Initially, interested graduating seniors, in Electronics Engineering Technology from ATC are expected to enroll in the program. In addition, professionals currently employed by ASCO Valve in Aiken, South Carolina, have shown interest in the program. The proposed program may also be of future interest to employees of other agencies in close proximity to ATC.

ESTIMATED NEW ENROLLMENT						
Year	Fall		Spring		Summer	
	Headcount	Credit Hours	Headcount	Credit Hours	Headcount	Credit Hours
2008-2009	5	30	0	0	0	0
2009-2010	5	60	0	0	0	0
2010-2011	5	60	0	0	0	0
2011-2012	3	30	0	0	0	0
2012-2013	2	20	0	0	0	0

**BSEET TRANSFER CREDIT COURSE GUIDE
(131 Semester Credit Hours)**

SCSU Course	Aiken Tech Equivalent
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Freshman

First Semester		Cr.	
E 150	English Composition I	3.0	ENG 101
M 152	Pre-Calculus	3.0	(MAT 110 and MAT 111) or MAT 112
CS 150	Computer Technology	3.0	CPT 101 or EGR 112
PE 150/ MS 101/ HED 151		2.0	SFT 109 (new)
ET 170	Intro. Eng. Tech.	3.0	
UNIV 101	Intro. Univ. Comm.	2.0	COL 103
Second Semester		Cr.	
E 151	English Composition II	3.0	ENG 102
M 153	Calculus I	3.0	MAT 140
C 150	General Chemistry	3.0	CHM 110
C 151	Gen. Chemistry Lab	1.0	CHM 110
ET 150	Mech. Draw/Basic CAD		(EGT 110 and EGT 151) or EGT 152

Sophomore

First Semester		Cr.	
ARTS 250/MU 250/D 254		3.0	ART 101 or MUS 105
M 163	Calculus II	3.0	MAT 141
P 254	General Physics	3.0	PHY 221
P 251	Gen. Physics Lab	1.0	PHY 221
EET 230	Circuit Analysis	3.0	EET 111
ET 212	Statics	3.0	
E 250/251	World Literature	3.0	ENG 208 or ENG 209
Second Semester		Cr.	
EET 232	Elec. Network Analysis	3.0	
EET 233	Circuit Lab	1.0	EET 111 and EET 112
P 255	General Physics	3.0	PHY 222
P 253	Gen. Physics Lab	1.0	PHY 222
EET 275	Engineering Mathematics	3.0	
ET 250	Tech. Communications	3.0	SPC 205
H 250/251	History	3.0	HIS 101 or HIS 102
SCSU Course		Aiken Tech Equivalent	

Junior

First Semester		Cr.	
EET 320	Intro. Comp. Program.	3.0	CPT 266
EET 330	Electronics I	3.0	EET 131
ETS 250	African-American Hist.	3.0	ENG 236
EET 374	Electrical Machines	3.0	

EET 381	Dig. Sys. Design & Anal.	3.0	EET 210
SOC 250/PSY 250		3.0	SOC 101 or PSY 201
Second Semester		Cr.	
EET 332	Electronics II	3.0	
EET 375	Electronics Comm.	3.0	EET 241
EET 382	Intro. to Microprocessor	3.0	EET 251 and EET 253
EET 383	Dig. & Micro. Lab	1.0	EET 210, EET 251 and EET 253
EET 392	Intro. PLC & Virtual Instr.	3.0	EET 235
Elective		3.0	

Senior

First Semester		Cr.	
EET 333	Electronics Lab	1.0	
EET 450	Intro. Elect. Power Sys.	3.0	
EET 453	Mach. & Power Lab	1.0	
EET 459	Senior Project Proposal	1.0	
EET 470	Automatic Control Sys.	3.0	
ET 255	Engg. Econ. Analysis	3.0	
Elective		3.0	
Second Semester		Cr.	
EET 443	PLC & Virt. Intr. Lab	1.0	
EET 460	Senior Project	3.0	
EET 475	Comp. Aided Design	3.0	
EET 480	Introduction to Robotics	3.0	
EET 483	Control & Robotics Lab	1.0	
Elective		3.0	

Curriculum

The curriculum for the BSEET program is shown on page 6. The level of achievement of the program's learning outcomes will be assessed by conducting a comprehensive examination which is called Fundamentals of Engineering Technology Examination (FETE). This examination will be offered twice a year and administered by the College of Science, Mathematics and Engineering Technology. The topics in this examination cover sciences and engineering technology subject areas, and are, in most part, identical to the National Fundamentals of Engineering (FE) Examination.

**CURRICULUM LEADING TO THE DEGREE
OF BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING TECHNOLOGY
(131 Credits)**

Freshman			
First Semester	Credits	Second Semester	Credits
E 150 Eng. Comp. I	3	E 151 Eng. Comp. II	3
M 152 Pre-calculus	3	M 153 Calculus I	3
CS 150 Comp. Tech.	3	M 155 Intro. Math Mod.	3
PE 150/MS 101.		C 150 Gen. Chem.	3
or HED 151 Personal & Comm. Health.	2	C 151 Gen. Chem. Lab	1
ET 170 Intro. to Eng. Tech.	3	ET 150 Mech. Draw/Basic CAD	3
UNIV 101 Intro. Univ. Comm.	2		
	16		16

Sophomore			
First Semester	Credits	Second Semester	Credits
ARTS 250/MU 250/D 254.	3	EET 232 Elect. Network Anal.	3
M 163 Calculus II	3	EET 233 Circuit Lab.	1
P 254 Gen. Physics	3	P 255 Gen. Physics	3
P 251 Gen. Physics Lab	1	P 253 Gen. Physics Lab	1
EET 230 Circuit Analysis I.	3	EET 275 Eng. Math	3
ET 212 Statics	3	ET 250 Tech. Comm.	3
E 250 or 251 World Lit.	3	H 250 or 251 History	3
	19		17

Junior			
First Semester	Credits	Second Semester	Credits
EET 320 Intro. Comp. Prog.	3	EET 332 Electronics II	3
EET 330 Electronics I.	3	EET 375 Electro. Comm.	3
ETS 250 African-Amer. Hist.	3	EET 382 Intro. To Microproc.	3
EET 374 Elect. Machines	3	EET 383 Dig. & Microproc. Lab.	1
EET 381 Dig. Sys. Design & Anal.	3	EET 392 Intro. PLC & Virt. Instr	3
SOC 250 or PSY 250.	3	Elective	3
	18		16

Senior			
First Semester	Credits	Second Semester	Credits
EET 333 Electronics Lab	1	EET 443 PLC & Virt. Lab	1
EET 450 Intro. To Elect. Pow. Sys.	3	EET 460 Senior Proj	3
EET 453 Mach. & Pow. Lab	1	EET 475 Comp. Aided Desig.	3
EET 459 Senior Proj. Prop.	1	EET 480 Into to Robotics	3
EET 470 Auto. Ctrl. Sys.	3	EET 483 Ctrl. & Rob. Lab.	1
ET 255 Eng. Econ. Anal	3	Elective	3
Elective	3		
	15		14

Faculty

Faculty Rank	Highest Degree Earned	Field of Study	Teaching in Field (Y/N)
Adjunct	Ph.D.	Electrical Engineering	Y
Adjunct	MS	Electrical Engineering	Y

Qualification of new faculty: This proposed program will use Aiken Technical College faculty as adjunct professors along with successfully trained educators to teach the courses. Instructors will have a minimum of a Masters degree in Electrical Engineering with at least 1 year of teaching experience.

UNIT ADMINISTRATION/FACULTY/STAFF SUPPORT						
YEAR	NEW		EXISTING		TOTAL	
	Headcount	FTE	Headcount	FTE	Headcount	FTE
Administration: <i>At SCSU this person is the Off-Campus Engineering Technology Program Coordinator</i>						
2008-2009			1	0.125	1	0.125
2009-2010			1	0.125	1	0.125
2010-2011			1	0.125	1	0.125
2011-2012			1	0.125	1	0.125
2012-2013			1	0.125	1	0.125
Faculty						
2008-2009	1 (adjunct)	0.5			1	0.5
2009-2010	1 (adjunct)	0.5	1 (adjunct)	0.5	2	1.0
2010-2011	0		2 (adjunct)	1.0	2	1.0
2011-2012	0		2 (adjunct)	1.0	2	1.0
2012-2013	0		2 (adjunct)	1.0	2	1.0
Staff						
2008-2009						
2009-2010						
2010-2011						
2011-2012						
2012-2013						

At South Carolina State University, 1 Faculty full-time equivalents (FTE) = 12 credit hours, and 1 credit hour = .083 FTE or 1 contact hour = .083 FTE. FTE status may be determined by credit hours or contact hours or a combination of the two.

Physical Plant

The existing facilities at Aiken Technical College will be used for classroom and labs, no additional building will be necessary.

Equipment

This program will use the instructional and laboratory facilities of Aiken Technical College. The equipment such as Electrical Measuring Tools, Oscilloscope, Digital Electronics Trainer, Process Control Trainer, Microprocessor Trainer, Electrical Machines, and Programmable Logic Controller are being used to conduct laboratory experiments in Electrical Engineering Technology courses. These equipment are available at Aiken Technical College. No additional equipment purchases will be necessary.

Library Resources

South Carolina State University's Miller F. Whittaker Library exceeds the 10,000 volumes required in Electrical Engineering Technology by the Association of Colleges and Research Libraries "Standards for College Libraries." In addition, the library provides a subscription to 7 major full-text electronic databases for current and retrospective information in electrical engineering technology. These are Academic OneFile, Dialog, Academic Search Premier, General OneFile, ACM Digital Library, Applied Science and Technology Index and III All Society Package (ASPP). These databases include millions of peer-reviewed journals and other reference sources for research and study. These documents provide authoritative, scientific, technical, practical, theoretical and experimental coverage.

These databases will:

- a) supplement the existing print materials for currency
- b) enhance the acquisition of new materials
- c) provide library and remote access
- d) improve the overall quality of the electrical engineering technology collection

Other library services used to support access and quality of the electrical engineering technology collection include:

- **Statewide library borrowing card** - available to students and faculty. It allows the individual check-out privileges at more than 55 public, private, and technical colleges and universities in South Carolina
- **PASCAL Delivers** – allows users to request rapid book delivery using interlibrary loan services from any member library by submitting an electronic

request for delivery of a book to their home institution, and receiving the books within a 48 hour period

- **Interlibrary loan services** - available from more than 58,000 libraries of all types in 115 countries and more than 88 million bibliographic records when materials are not owned by the library

It is projected that an additional 273 Electrical Engineering Technology books will be needed each year. The average cost of a book in electrical engineering technology is \$100.00. Therefore, funding for new books for five years ($\$27,300 \times 5$ years) will be \$136,500.00

ACCREDITATION

This program is an extension of the BSEET program at South Carolina State University's main campus, which is accredited by the Accreditation Board for Engineering and Technology (ABET). The BSEET program at Aiken Technical College will also be guided by the requirements of ABET. The next ABET cycle will occur in 2010, at which time, the program will be reviewed by ABET for Accreditation. Graduates of this program will not be subject to licensure.

Articulation

An initial Articulation Agreement was developed between SCSU and ATC in 2006. In 2008 the Articulation Agreement was revised to include the responsibilities of both institutions (see attached agreement). This agreement allows a smooth transition for students pursuing an Associates Degree at Aiken Technical College into the BSEET program at South Carolina State University.

Estimated New Costs

Over a five year period, the program is expected to cost \$242,100.00 (see charts on page10). The program will be administered by the College of Science, Mathematics and Engineering Technology. Since all the courses necessary for the program are already in place, no additional expenditure will be required to develop courses. A small number of adjunct faculty will be needed to teach courses. There is a very small rental fee and the regular cost for supplies and travel along with the aforementioned cost of new library books.

ESTIMATED NEW COST BY YEAR						
CATEGORY	1st	2nd	3rd	4th	5th	TOTALS
Program Administration	0	0	0	0	0	0
Faculty Salaries	\$9,000	\$18,000	\$18,000	\$18,000	\$18,000	\$81,000
Graduate Assistants	0	0	0	0	0	0
Clerical/Support Personnel	0	0	0	0	0	0
Supplies and Materials	\$3,000	\$3,000	\$3,500	\$3,500	\$4,000	\$17,000
Library Resources	\$27,300	\$27,300	\$27,300	\$27,300	\$27,300	\$136,500
Equipment	0	0	0	0	0	0
Facilities	\$120	\$120	\$120	\$120	\$120	\$600
Other (Identify) (Travel)	\$1,000	\$1,000	\$1,500	\$1,500	\$2,000	\$7,000
TOTALS	\$40,420	\$49,420	\$50,420	\$50,420	\$51,420	\$242,100
SOURCES OF FINANCING BY YEAR						
CATEGORY	1st	2nd	3rd	4th	5th	TOTALS
Estimated FTE Revenue Generated from the State	0	0	0	0	0	0
Tuition Funding (New Students only)	\$29,250.00	\$51,188.00	\$53,625.00	\$29,153.00	\$20,280.00	\$183,496.00
Other State Funding (Legislative Approp.)	0	0	0	0	0	0
Reallocation of Existing Funds	11,170.00	0	0	21,268.00	31,140.00	63,578.00
Federal Funding	0	0	0	0	0	0
Other Funding (Endowment, Auxiliary etc.)	0	0	0	0	0	0
TOTALS	\$40,420	\$51,188	\$53,625	\$50,421	\$51,420	\$247,074

Institutional Approval

The following internal bodies have approved the proposed Bachelor of Science in Electrical Engineering Technology at Aiken Technical College and associated Articulation Agreement between South Carolina State University and Aiken Technical College.

The Office of the Vice President for Academic Affairs
Education Policies Council
Faculty Senate
The Office of the President
SCSU Board of Trustees

February 5, 2008
February 14, 2008
April 8, 2008
April 29, 2008
April 29, 2008

ATTACHMENT

Articulation Agreement Between Aiken Technical College and South Carolina State University