

**Program Modification Proposal
 Bachelor of Science in Industrial Engineering
 South Carolina State University**

Summary

South Carolina State University requests approval to transition the B.S. in Industrial Engineering Technology into a B.S. in Industrial Engineering, to be implemented in Fall 2015. The proposed program is to be offered through traditional instruction. The South Carolina Code of Laws currently contains a provision which states that the Category B licensure for Professional Engineers for which engineering technology graduates are currently eligible will cease to exist as of July 1, 2020. As a result, graduates of Engineering Technology programs will no longer be able to become licensed as Professional Engineers. South Carolina State University is modifying its program so that graduates remain eligible for licensure. The following chart outlines the stages for approval of the proposal; the Advisory Committee on Academic Programs (ACAP) voted to recommend approval of the proposal. The full program proposal is **attached**.

Stages of Consideration	Date	Comments
Program Planning Summary received and posted for comment	Not Applicable	Not Applicable
Program Proposal Received	9/15/14	
ACAP Consideration	10/16/14	ACAP members expressed support for the proposed program. Dr. W. Franklin Evans from SCSU and Dr. Jeffrey Priest from USC Aiken described the ways in which they might collaborate such as sharing courses and faculty working on joint projects.
Comments and suggestions from CHE staff sent to the institution	10/28/14	Staff requested several revisions, including the following: <ul style="list-style-type: none"> • A clear statement describing the impetus for the change (i.e., that the existing law contains a provision which states that the Category B licensure for which engineering technology graduates are currently eligible will cease to exist as of July 1, 2020). • An explanation of the overall transition or phase-out plan of the existing program. • Additional information about why the proposed modification is expected to create an increase in enrollment and a smoother connection to the examples provided for Nuclear Engineering and Civil Engineering Technology

Stages of Consideration	Date	Comments
		<ul style="list-style-type: none"> • A discussion of the curricular changes necessary to move the program from Industrial Engineering Technology to Industrial Engineering. • The identification of any library resources required as a result of the proposed modification. • An explanation as to why no new faculty are needed for the proposed modification. • A brief description of the licensure process and a discussion about how the proposed program will prepare graduates for licensure. • An explanation of how existing funds are being reallocated as well as which federal funds support the program. • A discussion about possible articulation with the technical colleges. • A discussion of potential collaboration with USC Aiken.
Revised Program Proposal Received	12/1/14	The revised proposal satisfactorily addressed all of the requested revisions except for the discussion about possible articulation and potential collaboration. The University and USC Aiken submitted a letter to Commission staff addressing collaboration.

Recommendation

The staff recommends that the Committee on Academic Affairs and Licensing commend favorably to the Commission the program modification to transition the B.S. in Industrial Engineering Technology into a B.S. in Industrial Engineering, to be implemented in Fall 2015.

Proposing Institution

South Carolina State University

Title of Proposed Program

Bachelor of Science in Industrial Engineering

Submission Date

November 14, 2014

Mr. Thomas J. Elzey, President

South Carolina State University

300 College Avenue

Orangeburg, South Carolina 29117

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Program Modification Proposal Classification

Program Title:	Bachelor of Science in Industrial Engineering
Concentrations, Options, and Tracks:	None
Academic Unit Involved:	Department of Industrial and Electrical Engineering Technology, College of Science, Mathematics, Engineering and Technology
Designation, Type, and Level of Degree:	Bachelor's, Industrial Engineering, Four-year undergraduate
Proposed Date of Implementation:	Fall Semester, 2015
CIP Code:	150612
Site:	South Carolina State University, Orangeburg, SC
Program Designation:	Program Modification
Program Qualifies for Supplemental Palmetto Fellows and Life Scholarship Awards:	Yes
Delivery Mode:	Traditional
Area of Certification	N/A

Institutional Approval

Department of Industrial and Electrical Engineering Technology:	February 19, 2014
Dean:	February 20, 2014
Educational Policies Council:	February 27, 2014
Faculty Senate:	March 12, 2014
Board of Trustees:	April 3, 2014
President:	April 3, 2014

Purpose

South Carolina State University (SCSU) requests approval of a Bachelor of Science in Industrial Engineering degree (BSIE). The objective of this program is to modify the existing ABET-accredited Industrial Engineering Technology (IET) program at South Carolina State University (SCSU) to Industrial Engineering (IE) and to offer a BSIE to students at SCSU. In this modification, a total of 38 semester hours are removed from the current IET curriculum and a total of 39 semester hours of new courses are added. The courses that are added to the proposed IE curriculum are listed here. 1) M 237 Calculus III, 2) M 403 Differential Equations, 3) C 152 General Chemistry II, 4) C 153 General Chemistry II Lab, 5) EE 230 Circuit Analysis, 6) EE 233 Circuits Laboratory, 7) ENGR 213 Strength of Materials, 8) ENGR 313 Dynamics, 9) S 250 Public Speaking, 10) MGT 316 Database Management Systems, 11) IE 201 System Design I, 12) IE 368 Professional Practice in Industrial Engineering, 13) IE 440 Decision Support Systems, 14) IE 454 Industrial Operations Research II, and 15) IE 457 Facility Location. All these courses already exist in the university catalog except IE 201, IE 368, IE 440 and IE 457 which are developed for the IE program.

According to the Institute of Industrial Engineers's official definition, IE is concerned with the design, improvement, and installation of integrated systems of people, materials, information, equipment and energy. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems. Industrial Engineers apply engineering design to creating and improving systems that deliver products or services. For instance, an Industrial Engineer may be involved in designing a new production plant for a car manufacturer (a product), or in designing an effective emergency room for a hospital (a service). In designing these systems, an Industrial Engineer integrates equipment, materials, energy, information, and people together to meet business objectives, while insuring product/service quality and reliability, the safety and satisfaction of customers and employees, and the effective and productive use of resources.

The purposes of this proposed program are:

1. To provide students with opportunities to become licensed as Professional Engineers (PE) in the state of South Carolina. After June, 2020, a provision in South Carolina state law regarding professional licensure of engineers will become effective that will prohibit Engineering Technology graduates from becoming licensed as Professional Engineers in this state.
2. To provide students with enhanced employment opportunities after graduation, both inside and outside of South Carolina. Many employers will not hire Engineering Technology graduates; this is especially true in the state of South Carolina. For many existing and developing job opportunities in South Carolina, graduation from an Engineering Accreditation Commission of ABET (EAC of ABET) accredited institution (as opposed to an Engineering Technology Accreditation Commission (TAC of ABET) accredited institution) is a requirement for employment. Many institutions of higher learning also require this designation for those graduates who desire to pursue graduate degrees in engineering. Jobs with the US government may permit Engineering Technology graduates to be hired in engineering classifications *provided* they have passed the Fundamentals of Engineering (FE) examination. However, by extension, Engineering Technology graduates will most probably not be allowed to sit for this exam in the state of South Carolina after June 2020, since it is the preliminary and necessary step towards PE licensure.
3. To address the persistent demand for IE graduates.
4. To provide continuing education opportunities for locally employed engineering graduates who desire to do so, (e.g. admission to M.B.A. programs, distance education degree programs, and other similar programs that insist on EAC of ABET accredited undergraduate degrees).

5. To provide the technical manpower to the region that will ensure retention of existing industry and promote industry expansion within the local region.
6. To foster improved relationships between industry partners and SCSU through providing them with qualified employees.

The IE program is expected to be put into place in the fall of 2015. At that time all incoming students will be placed in the BSIE program and none will be allowed into the BSIET program as it will be in the process of phasing out. Students who are Juniors and Seniors in the BSIET program will graduate in that program; however, if they choose too, they will be allowed to change to the BSIE program. It will be fully explained to them that if they choose to change to the BSIE program that they may have to extend their time at SCSU. Students who are freshmen or sophomores in the BSIET program at that time will be transferred to the BSIE program. The existing BSIET program will be closed by the end of the 2017/2018 year.

Justification

To survive and prosper in today's global markets, companies must constantly improve the quality of their products and services, the productivity of their organizations, and how quickly they can respond to changing customer needs/wants. This is what Industrial Engineers do. Industrial Engineers have an incredibly diverse range of career options. Career opportunities can be found in traditional manufacturing, such as automotive and electronics manufacturing, and the aviation and ship-building industries; process industries such as chemical, steel, pharmaceuticals, and paper manufacturing; construction industries ; and service-oriented industries such as financial institutions, hospitals and health care, transportation and logistics, government, and business systems consulting. As firms facing global competition seek new ways to improve productivity, they will increasingly turn to industrial engineers to achieve these improvements. SCSU implemented its IET program in the fall of 1985 to take steps to remedy the lack of modern industrial engineers in the state. The IET program has been accredited by ABET/TAC since 1992 and SCSU is the only institution in the state that offers an accredited Bachelor of Science in Industrial Engineering Technology (BSIET) degree program. Demands placed on IE professions in industry have increased dramatically as manufacturing and the associated supply process have become increasingly complex.

There is a shortage of engineers nationally and in South Carolina. South Carolina State University, with its deep roots in the African-American community, is certain to attract and nurture to graduation young people who would otherwise not have considered a career in engineering. It is highly probable that the university will attract federal and foundation support not available to other universities in the state of South Carolina. The national Bureau of Labor Statistics projects 10,100 new jobs for Industrial Engineers between 2012-2022 and a job growth rate of about 5% nationally for all engineers. It also projects that the number of Industrial Engineers is expected to grow by 6 percent between 2010-2020. This is higher than the average for all engineering disciplines. The growth rate and demand for Industrial Engineers in South Carolina is higher because of the influx of new industries such as Boeing, Amazon, and BMW. New Industries are demanding a diverse work force. Experience has shown that industry prefers engineering graduates. In fact, some industries will not hire Engineering Technology graduates at all especially in South Carolina. Nonetheless, demand for IET graduates from SCSU remains high even during the current economic downturn, and over the past three years over 80% of IET graduates had either accepted a job offer or been admitted to a graduate program at the time of graduation. Several companies, who hired IET graduates of

SCSU, have been demanding qualified IE graduates based upon the quality of performance of our graduates. For example, Boeing Company in North Charleston, which has already recruited four IET graduates (two with M.S. degrees) and presented a seminar Spring Semester 2012-13 and Fall Semester 2013-2014 at SCSU, expressed their interest in recruiting IE graduates from SCSU rather than IET graduates. In addition, employed IET graduates consistently asked to change the IET program to an IE program.

The existing IET faculty is comprised of two Ph.Ds. in the IE discipline and one MS degree holder in IE with extensive industrial experience. The area coordinator was designated as a Governor's Distinguished Professor several years ago. Over the last two years the faculty has published twelve (12) articles in conference proceedings and professional journals. In addition the faculty currently has four (4) active federal grants. This faculty has demonstrated that it already produces IET graduates who are equal to IE graduates. Our recent IET graduates who have attended graduate programs have earned M.S. degrees from various prominent institutions such as Virginia Polytechnic Institutes and State University, Clemson University, and Florida International University. This is a clear demonstration of the fact that our IET graduates can compete successfully with graduates of IE programs anywhere. The proposed program will be able to satisfy the need for industrial engineers demanded by the local businesses and industries.

After June, 2020, a provision in South Carolina state law regarding professional licensure of engineers will become effective that will prohibit Engineering Technology graduates from becoming licensed as Professional Engineers in this state. This implies that any Engineering Technology major who graduated with a B.S. degree after 2012 cannot ever become licensed as a PE in this state with just this degree. The educational requirements for being allowed to qualify to take the professional engineering licensing exam in the state of South Carolina will exclude Engineering Technology graduates as of 2020. This change in policy will greatly disenfranchise IET graduates who are often equally qualified and deserving of being able to earn a professional engineering license as their IE graduate contemporaries. The IET program at SCSU has a history of producing high quality engineering professionals who are a credit to their organizations and to the engineering profession. It is imperative that the modification of the existing IET program at SCSU to an IE program be allowed so that future high quality engineering professionals who are graduates will have a fair opportunity to attain professional advancement and professional licensure if they so desire.

The mission of the College of Science, Mathematics, Engineering and Technology (CSMET) is to "produce scientists, mathematicians, engineers and engineering technologists who are ..." and the mission of SCSU encompasses the following benefits for successful students: "... prepares highly skilled, competent, economically and socially aware graduates to meet life's challenges and demands that enable them to work and live productively in a dynamic, global society." The proposed program is aligned to the missions of the University and CSMET in its goals to produce engineers and meet the needs of local business and industry.

The proposed program does not duplicate any of the existing programs currently offered by the university. The curriculum for the proposed IE program shares a common foundation with mathematics, chemistry, physics, and common engineering subjects.

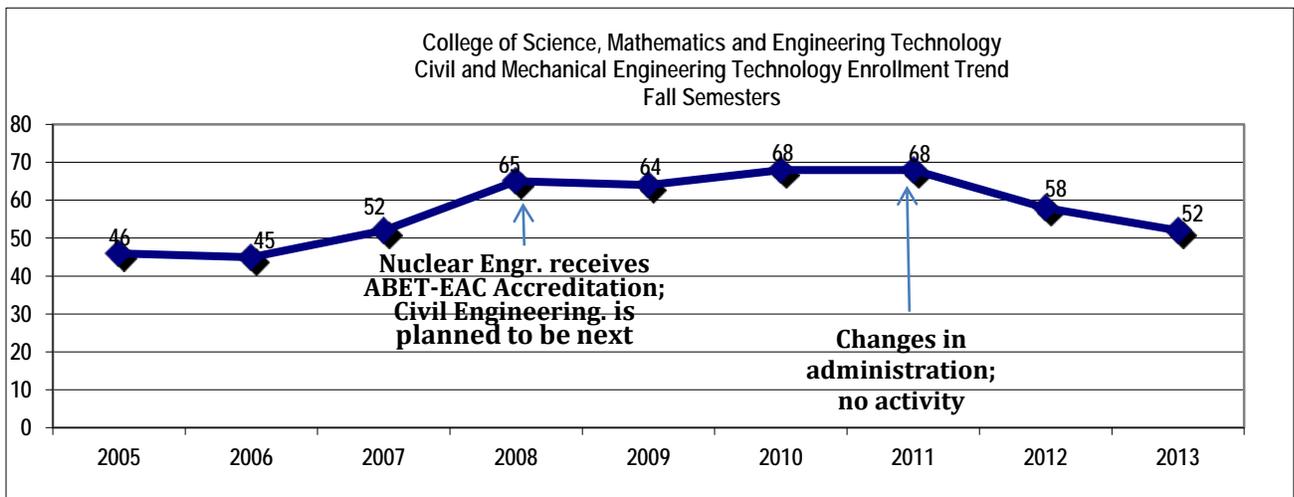
Enrollment

a)

The proposed modification is expected to create an increase in enrollment. South Carolina State University’s internal data strongly shows that the university will experience increased enrollment in engineering disciplines as shown in the existing Nuclear Engineering program at SCSU. The table below shows how the Nuclear Engineering Program at SCSU increased its enrollment between 2008 and 2012 even as the overall university’s enrollment decreased during that time.

Year	SC State Fall Enrollment	Nuclear Enrollment
2008	4888	30
2009	4538	36
2010	4362	49
2011	4326	53
2012	3807	55
2013	3461	55

The diagram below shows the increase in enrollment for the Civil Engineering Technology Program after an announcement was made that there was a plan to offer Civil Engineering at SCSU.



Both the Nuclear and Civil Engineering Programs enrollment examples indicate a clear student demand and interest in engineering at this university. The implementation of the Industrial Engineering program at SCSU should create the same trend in enrollment increases.

The alignment of academic training with current and predicted market demands in the areas related to this discipline (such as: logistics management, supply chain management, manufacturing processes, product/process efficiency, product layout, facilities layout, etc.) will attract many high performing students that are interested in pursuing careers in science and mathematics. This increase in enrollment should be visible in both the number of in-state

students who are present in this program as well the number of out-of-state students. This is due to the regional and national nature of market demands for an increased number of trained industrial engineers to fill modern and predicted workforce needs.

b)

Year	Estimated New Enrollment					
	Fall		Spring		Summer	
	Headcount	Credit Hours	Headcount	Credit Hours	Headcount	Credit Hours
2015-16	6	96	10	160	0	0
2016-17	16	256	20	320	0	0
2017-18	30	480	32	512	0	0
2018-19	38	608	40	640	0	0
2019-20	40	640	42	672	0	0

Curriculum

- a) Below is the IE curriculum. The courses removed from the existing IET curriculum include M 152 Pre-calculus, PE 150 Physical Education, CS 150 Computer Technology, M 250 Linear Algebra for Science and Engineering, MET 221 Machine Tool Lab, ET 250 Technical Communication, IET 350 Industrial Safety Engineering, ET 421 Thermodynamics, IET 450 Project Planning and Control, MET 427 NC Machinery, EAET 410 Engineering Ethics, and two 3 semester hour electives. The courses added include S 250 Public Speaking, M237 Calculus III, C 152 General Chemistry II, C 153 General Chemistry II Lab, IE 201 System Design I, ENGR 213 Strength of Materials, EE 230 Circuit Analysis, IE 368 Professional Practice in Industrial Engineering, EE 233 Circuits Laboratory, M 403 Differential Equations, IE 440 Decision Support Systems, IE 454 Industrial Operations Research II, IE 457 Facility Location, MGT 316 Database Management Systems, and ENGR 313 Dynamics. Four new courses: IE 201, IE 368, IE 440 and IE 457 (which are represented in the curriculum) have been developed specifically for the program and are described in section b. The curriculum is designed to meet the existing EAC of ABET criteria for the Industrial Engineering program.

South Carolina State University Industrial Engineering Program (Total Credits: 129)			
Freshman Year - First Semester		Freshman Year -Second Semester	
Course	Credit	Course	Credit
E 150 English Composition & Comm.	3	E 151 English Composition & Comm.	3
M 153 Calculus I	3	M 163 Calculus II	3
ENGR 150 Mech. Drawing & Basic CAD	3	S 250 Public Speaking	3
ENGR 170 Intro. to Eng. Technology	3	C 150 General Chemistry I	3
PSY 250/SOC 250	3	C 151 General Chemistry I Lab	1
UNIV 101 Intro. to Univ. Comm.	2	H 250/H 251 World History	3
Total	17	Total	16
Sophomore Year - First Semester		Sophomore Year -Second Semester	
Course	Credit	Course	Credit
M 237 Calculus III	3	C 152 General Chemistry II	3
P 254 General Physics I w/Calculus	3	C 153 General Chemistry II Lab	1
P 251 General Physics I Lab	1	P 255 General Physics II w/Calculus	3
ARTS 250/MU 250	3	P 253 General Physics II Lab	1
E 250/E 251 World Literature	3	IE 201 System Design I	3
ETS 250 African American History	3	IE 252 Industrial Statistics I	3
ENGR 212 Statics	3	ENGR 213 Strength of Materials	3
Total	19	Total	17
Junior Year - First Semester		Junior Year - Second Semester	
Course	Credit	Course	Credit
EE 230 Circuit Analysis	3	IE 355 Simulation Modeling	3
IE 368 Professional Practice in Industrial Engineering	1	IE 353 Intro. To Mfg. Systems Eng.	3
ENGR 255 Engineering Economic Analysis	3	IE 357 Industrial Operations Research I	3
ENGR 310 Engineering Computing	3	IE 356 Plant Layout and Material Handling	3
IE 352 Industrial Statistics II	3	EE 233 Circuits Laboratory	1
IE 354 Motion and Time Study	3	M 403 Differential Equations	3
Total	16	Total	16
Senior Year - First Semester		Senior Year - Second Semester	
Course	Credit	Course	Credit
IE 440 Decision Support Systems	3	IE 460 Technical Project	3
IE 452 Statistical Quality Control	3	MGT 316 Database Management Systems	3
IE 458 Human Factors Engineering	3	ENGR 313 Dynamics	3
IE 454 Industrial Operations Research II	3	IE 456 Production and Inventory Control	3
IE 457 Facility Location	3		
IE 459 Technical Project Proposal	1		
Total	16	Total	12

b) List of new courses to be added to the existing BSIET curriculum for modification into a BSIE program curriculum:

The courses listed in this section will be added to the existing courses within the current BSIET program at SCSU in order to modify the current program curriculum into the BSIE program curriculum at SCSU. These courses have been created and approved by the university.

1. IE 368 Professional Practice in Industrial Engineering {1 credit}

Description: This course is conducted as a seminar to orient students to issues of professional practice as an industrial engineer, through a discussion of design cases, industrial problems, and professional situations, led by South Carolina State University faculty and staff, and by practicing professionals.

2. IE 201 System Design I {3 credits}

Description: This course is an introduction to the design of industrial engineering systems. Emphasis is placed on design methodologies in the context of a design process including the user or stakeholder needs identification, the design specification development, the design concept generation, evaluation and selection, design development, the prototype development and refinement, and the product delivery to the customers. A series of projects are used to apply the knowledge to real life cases.

3. IE 457 Facilities Location {3 credits}

Description: This course is designed to teach students techniques used in finding a location for a new manufacturing facility. Topics discussed are transportation, work force, tax base, educational facilities, real estate availability, recreation and others. Upon completion of the course the student should be able to use the above techniques to select a suitable location for a new facility.

4. IE 440 Decision Support Systems {3 credits}

Description: This course is an application of Decision Support Systems arising in Industrial Engineering (IE). Emphasis is placed on the study of the design of design of Decision Support Systems for production and service systems based on operations research models. It includes methods of decision-making and problem solving, use of spreadsheet with VBA applications, databases, and integrated VBA development environments to implement Decision Support Systems.

Faculty

The existing faculty of the current IET program at SCSU will be used to implement the program modification for the IE program. There will be no required additional costs in terms of faculty in order to create the new BSIE program at SCSU.

The existing IET faculty is comprised of two Ph.Ds. in the IE discipline and one MS degree holder in IE with extensive industrial experience. The area coordinator was designated as a

Governor's Distinguished Professor several years ago. Over the last two years the faculty has published twelve (12) articles in conference proceedings and professional journals. In addition the faculty currently has four (4) active federal grants. This faculty has demonstrated that it already produces IET graduates who are equal to IE graduates. Our recent IET graduates who have attended graduate programs have earned M.S. degrees from various prominent institutions such as Virginia Polytechnic Institute and State University, Clemson University, and Florida International University. This is a clear demonstration of the fact that our IET graduates can compete successfully with graduates of IE programs anywhere. The proposed program will be able to satisfy the need for industrial engineers demanded by the local businesses and industries.

Physical Plant

- a) The existing plant infrastructure of the current IET program at SCSU will be used to implement the proposed program modification. There will be no required additional costs in terms of buildings or other plant infrastructure in order to complete this modification. The new Engineering and Computer Science Complex at SCSU (constructed in 2013), as well as the other existing buildings at this University, contain all of the necessary classroom and lab space for housing the proposed modification.
- b) There will not be any additional physical plant requirements resulting from this proposed modification.

Equipment

There are not any major equipment items that will need to be purchased in order to perform the proposed modification. All of the equipment being used by the current program are appropriate and necessary to be applied to the modified program.

Library Resources

- a) The library has the ability to support the BSIET program. The close proximity between the existing BSIET program and the modified program with the proposed changes, will allow for the library to continue to support the necessary library related activities. There should be no diminishing effects to the overall ability of the library to function as a vital support tool for academics due to the implementation of the proposed modifications.
- b) New course proposals (requiring new textbooks) at SCSU are approved by the Dean of the Library only after the needed references or materials are acquired. The Dean of the Library has approved each of the four new courses that have been created for the new BSIE program. For this program, the acquisition cost for the needed references for all new courses was covered by the grant or SCSU Foundation.

IE 457 – Facilities Location

The acquisition cost for the needed references was covered by the grant funded by the US Department of Agriculture

IE 201 – System Design I

The order for the needed references was paid for through the SCSU Foundation.

IE 368 – Professional Practice in Industrial Engineering

Neither text nor reference is required.

IE 440 – Decision Support Systems

The acquisition cost for the needed references was covered by the grant funded by the US Department of Agriculture.

The library's existing books, journals, and electronic databases should be able to fulfill the requirements for this program. Therefore the estimated costs are nonexistent.

c) PASCAL is one of the tools that are currently available for use for the IET program. The availability and use of PASCAL will continue with the implementations of the proposed modifications.

Accreditation, Approval, Licensure, or Certification

The current program has been and is currently accredited by the Technology Accreditation Commission (TAC) of ABET. After the modification is implemented, the accrediting body will switch from TAC of ABET to the Engineering Accreditation Commission (EAC) of ABET. ABET accreditation will be pursued. The BSIE program is expected to be EAC of ABET accredited within four years of CHE approval. In South Carolina graduates of an ABET EAC accredited program may apply for licensure from the State Board of Professional Engineers and Land Surveyors. The graduates do this by first taking the Fundamentals of Engineering exam (FE) either during their last semester before graduating or very shortly after. Then they work in the field for a minimum of four years and apply to take the Professional Engineering (PE) exam. After successful completion of these requirements they may become licensed as Professional Engineers. The engineering department at SCSU is planning on creating a series of courses which will aid the students in passing the FE exam.

Estimated Costs and Source of Financing

The existing faculty, staff, and infrastructure of the current BSJET program at SCSU will be used to implement the new BSIE program. There will be no required additional costs in terms of faculty, buildings, or other resources in order to create the new BSIE program at SCSU.

ESTIMATED COSTS BY YEAR						
CATEGORY	1st	2nd	3rd	4th	5th	TOTALS
Program Administration ¹	18,264	18,629	19,002	19,382	19,770	95,047
Faculty Salaries ²	164,761	168,056	171,417	174,845	178,343	857,422
Graduate Assistants	0	0	0	0	0	0
Clerical/Support Personnel	6,000	6,000	6,000	6,000	6,000	30,000
Supplies and Materials	2,000	2,000	2,000	2,000	2,000	10,000
Library Resources	0	0	0	0	0	0
Equipment	0	0	0	0	0	0
Facilities	0	0	0	0	0	0
Other (Identify)	0	0	0	0	0	0
TOTALS	191,025	194,686	198,419	202,227	206,112	992,469

SOURCES OF FINANCING BY YEAR						
Tuition Funding ³	58,320	131,220	225,990	284,310	298,890	998,730
Program-Specific Fees	0	0	0	0	0	0
State Funding*	0	0	0	0	0	0
Reallocation of Existing Funds**	191,025	194,686	198,419	202,227	206,112	992,469
Federal Funding ⁴	43,448	0	0		0	43,448
Other Funding (Adjunct faculty salary, etc.)	0	0	0	0	0	0
TOTALS	292,793	325,906	424,409	486,537	505,002	2,034,647

¹This figure includes 25% release time for the Academic Program Coordinator (APC) of the Industrial Engineering Program. A salary increase of 2% is assumed in subsequent years.

²These are salaries of the faculty of the existing Industrial Engineering Technology program and are paid from E&G budget. This includes 75% of the salary of the APC. The faculty salary raise is assumed to be 2% in each subsequent year.

³The tuition is calculated at the rate of \$3,645 per student per semester.

⁴This figure includes the release time money of one of the IET faculty (Co-PI) and students' stipend from a research project. The Industrial Engineering Technology faculty members have several pending grants amounting about \$1M that are not included here since results will not be made known until January 2015.