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

Summary

South Carolina State University (SCSU) requests approval to transition the B.S. in Civil Engineering Technology into a B.S. in Civil Engineering, to be implemented in Fall 2016. 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 of review for the proposal; the Committee on Academic Affairs and Licensing (CAAL) voted to recommend approval of the proposal. The full program proposal, supplemental material about student recruitment as requested by ACAP, and a letter of support from the current Board of Trustees and Interim President as requested by CAAL are attached.

Stages of Consideration	Date	Comments
Program Modification Proposal Received	5/1/15	Not Applicable
ACAP Consideration	6/11/15	University representatives explained the need for the proposed program. The representative from Orangeburg-Calhoun Technical College expressed support for the proposed program. The representative from USC requested additional data/information to support the claim that the proposed program will recruit from a different pool of students than the existing civil engineering programs in the state. SCSU representatives stated that the University mainly recruits minority students and agreed to provide additional information about student recruitment.
Comments and suggestions from CHE staff sent to the institution	6/15/15	Staff requested the proposal be revised to: • Clarify that the existing Civil Engineering Technology program is transitioning to a Civil Engineering program and explain the overall transition or phase-out plan of the existing program. • Separate the program objectives from the need/reasons to change the program from Civil Engineering Technology to Civil Engineering. • Provide the growth rate for SC referenced in the proposal.

Stages of Consideration	Date	Comments
		• Present a stronger justification of the need for the program. • Connect and explain the examples used to support the modification. • Provide a context for the chart showing the enrollment in the civil engineering technology program. • Include information to support the statement made at the ACAP meeting about the program being one that will help grow enrollment at the University. • Provide evidence to support the claim that the University attracts a different pool of students than the other institutions that offer civil engineering programs in the state.
Revised Program Proposal Received	6/24/15	The revised proposal and additional supplemental material provided satisfactorily addressed all of the requested revisions.
CAAL Consideration	7/15/15	The University's representative explained the need to transition the program from an engineering technology program to an engineering program. Commissioners asked about access and equity and the University's representative described the institution's recruitment strategies to attract diverse students. While the administration's recruitment strategies do not exclude any race, the representative stated that the institution primarily attracts African-American students. He also informed Commissioners that the institution has had an increase in the number of white students enrolled in the past five years and that some programs attract a better mix of students. He then cited the example of the speech pathology program for which 50% of the students enrolled are white. Commissioners also applauded the institution's efforts to recruit females to its engineering programs. The University's representative then responded to a question about ABET accreditation by explaining the accreditation process, informing the Commissioners that two current faculty members are ABET evaluators, and identifying the programs at

Stages of Consideration	Date	Comments
		the institution that are ABET accredited. Commissioners asked about equipment needed to support the transition to an engineering program and the University's representative assured the Committee that the institution has the equipment necessary to support the program. Commissioners also noted that the modification proposal was approved by the previous President and Board of Trustees and asked whether the new Board and Interim President supported the program. The University representative provided a letter of support as requested (attached).

Recommendation

The Committee on Academic Affairs and Licensing recommends the Commission approve the program modification to transition the B.S. in Civil Engineering Technology into a B.S. in Civil Engineering, to be implemented in Fall 2016.

Name of Institution

South Carolina State University

Name of Program (include concentrations, options, and tracks)

Civil Engineering

Program Designation

- ☐ Associate's Degree
- ☒ Bachelor's Degree: 4 Year
- ☐ Bachelor's Degree: 5 Year
- ☐ Master's Degree
- ☐ Specialist
- ☐ Doctoral Degree: Research/Scholarship (e.g., Ph.D. and DMA)
- ☐ Doctoral Degree: Professional Practice (e.g., Ed.D., D.N.P., J.D., Pharm.D., and M.D.)

Does the program qualify for supplemental Palmetto Fellows and LIFE Scholarship awards?

- ☒ Yes
- ☐ No

Proposed Date of Implementation
Fall 2016

CIP Code
150612

Delivery Site(s)
Traditional

Delivery Mode

- ☒ Traditional/face-to-face*
  *select if less than 50% online
- ☐ Distance Education
  - ☐ 100% online
  - ☐ Blended (more than 50% online)
  - ☐ Other distance education

Program Contact Information (name, title, telephone number, and email address)
Dr. Kenneth Lewis, Dean
College of Science, Mathematics, Engineering & Technology
803-536-8860; klewis31@scsu.edu

Institutional Approvals and Dates of Approval

Department of Civil & Mechanical and Nuclear Engineering:	September 03, 2014
Dean (CSMET):	September 03, 2014
Dean, Library & Information Services:	September 04, 2014
Registrar:	September 09, 2014
Provost's Office:	September 18, 2014
Educational Policies Council:	September 25, 2014
Faculty Senate:	October 7, 2014
President:	October 14, 2014
Board of Trustees:	December 4, 2014

Background Information

Provide a detailed description of the proposed modification, including its nature and purpose and centrality to institutional mission. (1500 characters)

South Carolina State University (SCSU) requests approval of a Bachelor of Science degree in Civil Engineering (BSCE). The objective of this proposal is to modify the existing ABET-accredited Civil Engineering Technology (CET) program at SCSU to Civil Engineering (CE) and to offer a BSCE to students at SCSU. In this modification, a total of 21 semester hours are removed from the current CET curriculum and a total of 24 semester hours of new courses are added.

With the need to expand our civil engineering infrastructure (roads, bridges, utilities, buildings, etc.) in order to accommodate the growing population both at the state and national levels as well as maintain our deteriorating infrastructure, the need for civil engineers and civil engineering technologists could not be higher. The proposed Civil Engineering program is designed to contribute to the amelioration of the shortage of qualified civil engineers and thus satisfy the quest for licensure of many civil engineering technologists in the State who find the current pathway to professional licensure difficult.

The mission of the College of Science, Mathematics, Engineering and Technology (CSMET) is to "…produce scientists, mathematicians, engineers and engineering technologists who are highly skilled, competent, and well prepared to enter professional careers in the public and private sector and to pursue degrees beyond the baccalaureate level in professional or graduate school". The mission of SCSU is to prepare "highly skilled, competent, economically and socially aware graduates to enable them to work and live productively in a dynamic, global society."

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

The CE program is expected to be put into place in the fall of 2016. At that time all incoming students will be placed in the BSCE program and none will be allowed into the BSCET program as it will be in the process of phasing out. Students who are Juniors and Seniors in the BSCET program will graduate in that program; however, if they choose too, they will be allowed to change to the BSCE program. It will be fully explained to them that if they choose to change to the BSCE program that they may have to extend their time at SCSU. Students who are

freshmen or sophomores in the BSCET program at that time will be transferred to the BSCE program. The existing BSCET program will be closed by the end of the 2018/2019 year.

List the objectives of the modified program. (1500 characters)

The objectives 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 the South Carolina state law regarding professional licensure of engineers will become effective that will prohibit B.S. Engineering Technology graduates from becoming licensed as Professional Engineers in this state, unless they receive an ABET-EAC accredited degree.

2. To provide students with enhanced employment opportunities after graduation, both inside and outside of South Carolina.

3. To address the persistent demand for Civil Engineering graduates.

4. To provide continuing education opportunities for locally employed engineering graduates with the necessary education to prepare them for post graduate education (that insist on EAC of ABET accredited undergraduate degrees) in civil engineering or related fields.

5. To provide the technical manpower to the region, especially of minorities.

The CE program is scheduled to begin in the fall of 2016. The proposed program will admit only students who have the necessary prerequisites to meet the challenge of a rigorous program.

Assessment of Need

Provide an assessment of the need for the program modification for the institution, the state, the region, and beyond, if applicable. (1500 characters)

Civil Engineers have an incredibly diverse range of career options. Career opportunities can be found in many areas such as the geotechnical field, transportation, geomatics, structures, construction, water resources, environmental studies, site civil design, etc. Graduates from the Civil Engineering program at South Carolina State University will be qualified to meet the needs of the local as well as national civil engineering firms, municipalities, counties, state and federal governments. Moreover, as part of a Historically Black College or University (HBCU), this program would contribute to addressing issues of diversity in the Civil Engineering community while continuing to foster excellence in education for both the minority and majority populations of the State of South Carolina. The CET program has been accredited by ABET/ETAC since 1983 and SCSU is the only public HBCU in the state that offers an accredited Bachelor of Science degree in Civil Engineering Technology (BSCET). Demands placed on CE professions have increased dramatically as the need for construction of new as well as maintenance and rehabilitation of infrastructure have increased.

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 SCSU will attract federal and foundation support not available to other universities in the state of South Carolina. The national Bureau of Labor Statistics projects 53,700 new jobs for Civil Engineers between 2012 and 2022 and a job growth rate of about 20% nationally for all engineers. This is higher than the average for all engineering disciplines. The growth rate and demand for Civil Engineers in South Carolina is higher because of the influx of new as well as maintenance and rehabilitation of infrastructure such as bridges, roads, and other civil engineering projects. A diverse work force is demanded in the profession, and some civil engineering entities will not hire Engineering Technology graduates at all especially in South Carolina.

The projected percentage change for Civil Engineering employment is 20% nationally. In addition, according to “recruiter.com”, the overall outlook for civil engineer careers has been positive since 2004. Vacancies for this career have increased by 14.16% nationwide in that time, with an average growth of 2.36% per year. Demand for civil engineers is expected to go up, with an expected 96,780 new jobs filled by 2018. This represents an annual increase of 4.86% over the next few years.

In recent years, Civil Engineers have the highest job vacancies and job growth rate in the State of South Carolina is 18.7%, and is ranked #7 in the nation (source: recruiter.com).

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 that degree. This change in policy will greatly disenfranchise CET graduates who are often equally qualified and deserving of being able to earn a professional engineering license as their CE graduate contemporaries. The CET 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 CET program at SCSU to an CE program be allowed so that future high quality

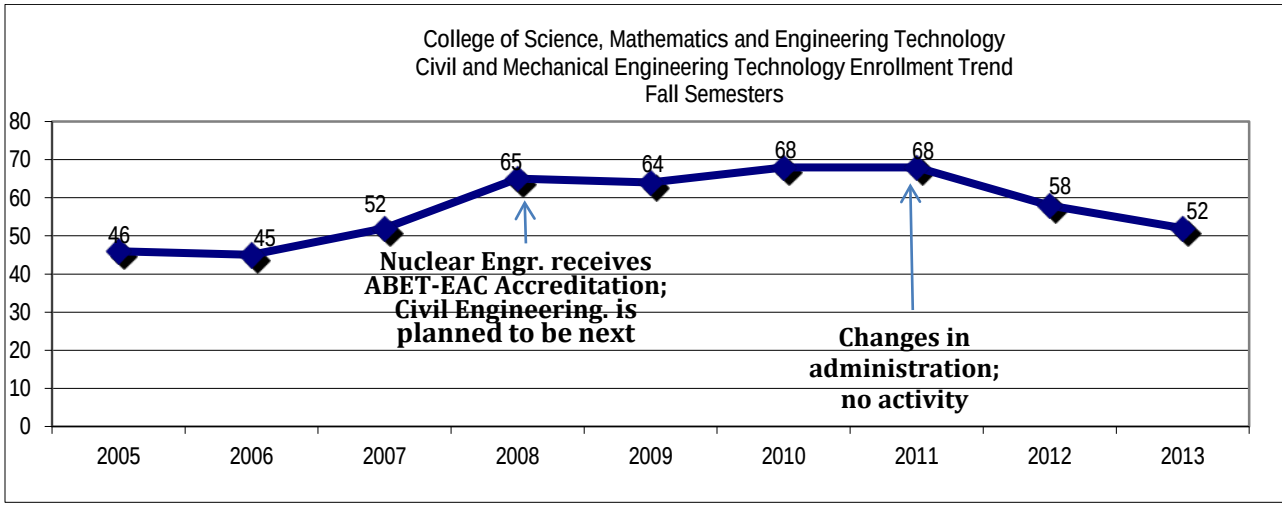
engineering professionals who are graduates will have a fair opportunity to attain professional advancement and professional licensure if they so desire.

The 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

As explained in additional supplementary Targeted Pools for Recruiting Students to Engineering Programs at South Carolina State University (attached), one of the major arguments made by "legacy" students and native African American South Carolina students who would otherwise attend South Carolina State is that a full Engineering program (other than Nuclear) did not exist at this university. With the recent approval to offer Industrial Engineering, the inclusion of a Civil Engineering program at South Carolina State will undoubtedly reverse the trend of native students seeking to major in Engineering from selecting North Carolina A & T, Florida A & M, and Tuskegee Universities. African American students opting to attend these out-of-state schools generally do not desire to attend either Clemson or South Carolina, even though they may have been recruited and/or admitted to these schools. Thus, South Carolina State University would now provide the in-state alternative for such students. In recent experience, this amounts to 2-3 well-qualified students per year from Orangeburg-Wilkinson High School alone.

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.



Considering the low enrollment at SCSU, in general, the increase should be looked at percentage wise. From 45 students to 68, the percentage increase is 51%. The enrollment increase is indeed 23 students that translate to 51%. The decrease as shown in the diagram is due to the "Changes in administration" and the publicity of the whole school in general.

Both the Nuclear and Civil Engineering Technology Programs enrollment examples indicate a clear student demand and interest in engineering at this university. The implementation of the Civil 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 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 as well the number of out-of-state students.

Will the proposed modification impact any existing programs and services at the institution?

☐ Yes

☒ No

If yes, explain. (1000 characters)

List of Similar Programs in South Carolina

Program Name	Institution	Similarities	Differences
Civil Engineering	Clemson University	Both universities offer the same program.	[1](1) Geographic distance between the two institutions indicates that they serve different regions of the state. (2) SCSU's emphasis on minority recruitment
Civil Engineering	USC	Both universities offer the same program.	[1](1) SCSU's emphasis on minority recruitment
Civil Engineering	Citadel	Both universities offer the same program.	[1](1) SCSU's emphasis on minority recruitment (2) Distinctly different recruitment & different student populations
		[1]While SCSU recruits and serves all students, as an HBCU, its student body is predominantly African American. The University serves a different geographical region when compared to Clemson University, and does not compete for students with USC or the Citadel even though all three universities are within one and one-half hours away from each other. Further, the great need for civil engineers in the state and nation as noted in the data from the Bureau of Labor Statistics, indicates that the state's public higher education institutions need to produce many graduates to fill the civil engineering needs that currently exist and those that will exist in the future. Please see additional supplementary Targeted Pools for Recruiting Students to Engineering Programs at South Carolina State University (attached).	

Description of the Program

Projected New Enrollment						
Year	Fall		Spring		Summer	
	Headcount	Credit Hours	Headcount	Credit Hours	Headcount	Credit Hours
2015-2016	5	75	5	75	0	0
2016-2017	10	150	10	150	0	0
2017-2018	15	225	15	225	0	0
2018-2019	20	300	20	300	0	0
2019-2020	21	315	21	315	0	0

Curriculum

Attach a curriculum sheet identifying the courses required for the program.

Curriculum Changes

Note: Complete this table only if there are changes to the curriculum.

Courses Eliminated from Program	Courses Added to Program
M 152 Pre-Calculus (3 cr)	[1]PSC 202 – Physical Geology (3 cr)
CS 150 – Computer Technology (3 cr)	[1]M 237 – Calculus III (3 cr)
M 250 – Linear Algebra (3 cr)	[1]M 403 – Differential Equations (3 cr)
CET 312 – Route Surveying (3 cr)	[1]CET 318 – GPS & Control Survey. (3 cr)
CET 412 – Codes & Regulations (3 cr)	[1]CET 428 – Hydrology & Drainage (3 cr)
CET 420 – Water & Sewage (3 cr)	[1]CET 419 – Foundation Engineering (3 cr)
Open Elective (3 cr)	[1]CET 424 – Elements of GIS (3 cr)
	[1]TRP 530 – Transportation Planning (3 cr)

[1]Courses already in the SCSU's catalog

CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING AT SOUTH CAROLINA STATE UNIVERSITY
134 CREDIT HOURS

FRESHMAN

First Semester	Credits	Status	Second Semester	Credits	Status
E-150 English I (NP)	3	_____	E-151 English II (E 150)	3	_____
M 153 Calculus I (M 152)	3	_____	M 163 Calculus II (M 153)	3	_____
ET 150 Basic Cad (NP)	3	_____	CET 205 Com. Aided Draft. (ET 150)	3	_____
ENGR 170 Intro. Engr. (NP)	3	_____	C-150 Chemistry (NP)	3	_____
UNIV-101 Intro. to Univ. Comm. (NP)	2	_____	C-151 Chemistry Lab (NP)	1	_____
PE-150 or HED-151 (NP)	2	_____	PSC 202 Physical Geology (NP)	3	_____
	16			16	

SOPHOMORE

First Semester	Credits	Status	Second Semester	Credits	Status
E 250 or E 251 Literature (M 153)	3	____	P 255 Physics II (P 254)	3	_____
M 237 Calculus III (M 153)	3	____	P 253 Physics Lab.(P 254/251)	1	_____
P-254 Physics I (M 153)	3	____	ET 250 Tech. Comm. (E 150/E 151)	3	_____
P-251 Physics I Lab. (M 153)	1	____	M 403 Diff Equ (M 237)	3	_____
ET 255 Engr. Econ. (M 152)	3	____	ENGR 213 Str of Mat. (ENGR 212)	3	_____
ENGR 212 Statics (M 152)	3	____	A 250 or MU 250 or Drama 254 (NP)	3	_____
	16			16	

JUNIOR

First Semester	Credits	Status	Second Semester	Credits	Status
Soc-250 or Psy 250 (NP)	3	_____	EET 230 Circuit Ana. (M 153)	3	_____
ET 310 Engr. Computing (NP)	3	_____	ETS 250 or HHU 250 (NP)	3	_____
H 250 of H 251 History (NP)	3	_____	ENGR 313 Dynamics (ENGR 212)	3	_____
CET 319 Theo. of Struc.(ET 213/M153)	3	_____	CET 320 Highway Engr. (CET 311)	3	_____
CET 311 Plane Survey. (M 152)	3	_____	CET 315 Construction (JST)	3	_____
ET 421 Thermo. (M 163/P254/P251)	3	_____	CET 318 GPS & Contr Surv (CET 311)	3	_____
	18			18	

SENIOR

First Semester	Credits	Status	Second Semester	Credits	Status
CET 413 Struc. Design (CET 319)	3	_____	CET 414 Struc. Design (CET 319)	3	_____
ENGR 417 Mat. Test. Lab. (ET 213)	3	_____	CET 419 Foundation Engr (CET 418)	3	_____
CET 418 Soil Mechanics (ET 213)	3	_____	CET 428 Hydrology & Drainage (CET 415)	3	_____
CET 415 Fluid Mech. (ET 313)	3	_____	CET 460 Sr. Project (SST)	3	_____
CET 459 Sr. Proj. Prop. (SST)	1	_____	TRP 530 Transp. Planning	3	_____
Restricted Elective (Select One)	3	_____	CET 424 Elements of GIS	3	_____
EAET 410 Engineering Ethics OR					
EAET 411 Role of Engineers (SST)					
	16			18	

LEGEND: TFD – Transferred, CE – Credit By Examination, E- Exempt
NB Students who are exempt from any course must take other approved course(s) in order to complete total credit hour requirement.
( ) Prerequisites / NP- No Prerequisites/ COR-Co-requisites / SST-Senior Standing / JST-Junior Standing

Faculty

Provide a brief explanation of any additional institutional changes in faculty and/or administrative assignment that may result from implementing the proposed program modification. (1000 characters)

The existing faculty of the current CET program at SCSU will be used to implement the program modification for the CE program.

Faculty Rank	Degrees
Associate Professor	PhD Civil Engineering: GeoMatics & Geotechnical M.A.Sc. Civil Engineering B.Sc. Civil Engineering
Associate Professor	PhD Civil Engineering: Geotechnical M.Sc. Civil Engineering B.Sc. Civil Engineering
Assistant Professor	PhD Civil Engineering: Structural M.Sc. Civil Engineering B.Sc. Civil Engineering
Assistant Professor	PhD Civil Engineering: Transportation M.Sc. Civil Engineering B.Sc. Civil Engineering

Resources

Identify any new library/learning resources, new instructional equipment, and new facilities or modifications to existing facilities needed to support the modified program. (2000 characters)

There are no additional requirements on the physical plant since there is adequate space and facilities to support the Civil Engineering program in its current location in Engineering & Computer Science Complex. The $4,000 annually designated for library as shown in the Financial Support table is needed keep abreast of new publications in the field.

Financial Support

Estimated New Costs by Year						
Category	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Total**
Program Administration						
Faculty and Staff Salaries (Overload or Adjunct)						
Graduate Assistants						
Equipment						
Facilities						
Supplies and Materials	3,000	3,000	3,000	3,000	3,000	15,000
Library Resources	4,000	4,000	4,000	4,000	4,000	20,000
Other*						
Total	7,000	7,000	7,000	7,000	7,000	35,000
Sources of Financing						
Category	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Total**
Tuition Funding	50,440	100,880	151,320	201,760	211,848	716,248
Program-Specific Fees						
State Funding (i.e., Special State Appropriation)*						
Reallocation of Existing Funds*						
Federal Funding*						
Other Funding*						
Total						
Net Total (i.e., Sources of Financing Minus Estimated New Costs)	50,440	100,880	151,320	201,760	211,848	716,248

[1]The tuition (and fees) is calculated at the rate of $5,044 per student per semester.

Budget Justification

Provide a brief explanation for the other new costs and any special sources of financing (state funding, reallocation of existing funds, federal funding, or other funding) identified in the Financial Support table. (1000 characters)

Note: Institutions need to complete this budget justification *only* if any other new costs, state funding, reallocation of existing funds, federal funding, or other funding are included in the Financial Support table.

The existing faculty, staff, and infrastructure of the current BSCET program at SCSU will be used to implement the new BSCE program. There will be no required additional costs in terms of faculty, buildings, or other resources in order to create the new BSCE program at SCSU. The funds for supplies and upkeep of library resources have been included in the budget to ensure that the program keeps abreast of trends in the field.

Evaluation and Assessment

Will any the proposed modification impact the way the program is evaluated and assessed?

☐ Yes

☒ No

If yes, explain. (1000 characters)

Will the proposed modification affect or result in program-specific accreditation?

☒ Yes

☐ No

If yes, explain; if the modification will result in the program seeking program-specific accreditation, provide the institution's plans to seek accreditation, including the expected timeline for accreditation. (500 characters)

The current program has been and is currently accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET. After the modification is implemented, the accrediting body will switch from ETAC of ABET to Engineering Accreditation Commission (EAC) of ABET. ABET accreditation will be pursued. The BSCE program is expected to be EAC of ABET accredited within four years of CHE approval.

Will the proposed modification affect or lead to licensure or certification?

☒ Yes

☐ No

If yes, explain how the program will prepare students for licensure or certification. (500 characters)

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 workshops which will aid the students in passing the FE exam.

Teacher or School Professional Preparation Programs

Is the proposed modified program a teacher or school professional preparation program?

☐ Yes

☒ No

If yes, complete the following components.

Area of Certification

Attach a document addressing the South Carolina Department of Education Requirements and SPA or Other National Specialized and/or Professional Association Standards.

Targeted Pools

for

Recruiting Students

to

Engineering Programs

at

South Carolina State University

CHE-ACAP Responses

Considerations of the applicant pool that will be targeted by South Carolina State University in implementing a Civil Engineering program can be seen based on the Nuclear Engineering program data below. Nuclear Engineering is the lone active engineering program at South Carolina State University at this time (the B.S. in industrial Engineering is scheduled for implementation in Fall 2015). Based on data from this program, as shown below, it is clear that a key targeted applicant pool is ***females***, with emphasis on African American females. These young women are primarily drawn from the immediate service area of the university and from surrounding states, particularly Georgia. Approximately nine percent (9%) of South Carolina State's female Nuclear Engineering graduates are white. A second major targeted group consists of African Americans in the immediate service area of the university (i.e. Orangeburg and nearby counties); and a third targeted group is "legacy" students, i.e. those students whose relatives, teachers, or friends have previously attended this university, and have inspired/encouraged them to attend this institution.

The proposed Civil Engineering program at South Carolina State University will continue to target females, especially African Americans. It will also target "legacy" students, and those capable African American students seeking to earn an Engineering degree but who desire to study Engineering at an HBCU rather that at Clemson University or at the University of South Carolina. Typically, such students elect to attend North Carolina A &T or Florida A & M. We have lost many high performing graduates from Orangeburg-Wilkinson High school to these institutions because we do not currently offer full Engineering programs (other than Nuclear Engineering). A review of the three highest ranked Civil Engineering Technology graduates in the class of 2015 illustrates this point well: Hirut Kollech , who lives with a North Carolina family, chose South Carolina State because a member of her host family attended here; Deondre Glover, an Orangeburg native with very high test scores and class rank, chose to stay close to home; and Deja Jackson, a South Carolinian from the low country who scored in excess of 1200 (M/V) on the SAT, was heavily recruited by Clemson, but preferred the size, social climate, and opportunity to play multiple sports at South Carolina State.

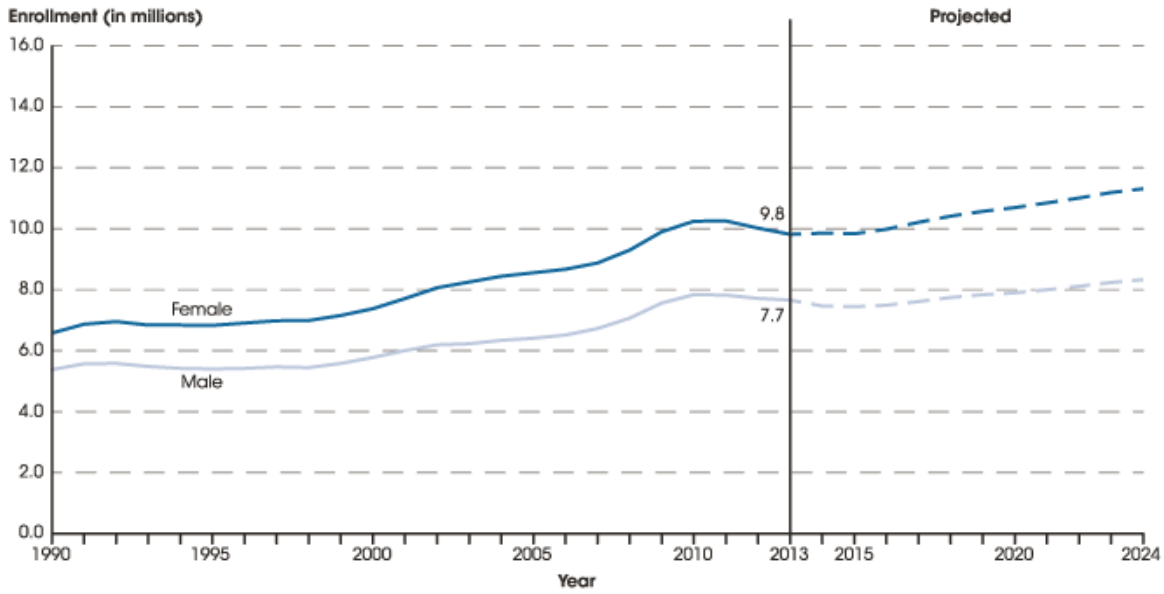
Rationale for Targeting Females

Females make up more than half of the US population, more than half of the college and university population (see Figure 1), but have (only recently) accounted for about 19.1% of all students receiving Engineering degrees in the United States in 2014 ("Engineering by the Numbers", by Brian L. Yoder, ASEE website at www.asee.org/colleges). If the United States is to remain competitive globally, this nation must now utilize every segment of its population to buttress its Engineering ranks. Women of all ethnic and racial groups now comprise the largest segment of the population. This demographic must be targeted for the sake of preserving this country's place in the world technologically. Importantly, the focus must be on recruiting women specifically into Engineering disciplines.

In a recent paper by Randal S. Olson of the University of Pennsylvania, he cites that most STEM majors **do not** exhibit severe gender disparity: in 2012, 40-45% of all degrees conferred in Math, Statistics, and the Physical Sciences were earned by women. In Biology, women earned 58% of all degrees conferred in 2012. The real gender disparity, then, is not in STEM in general, but rather in Engineering and

Technology disciplines. This is borne out by just looking at the ASEE graduation rate data by Yoder, previously cited.

Figure 1. Actual and projected undergraduate enrollment in degree-granting postsecondary institutions, by sex: Fall 1990–2024



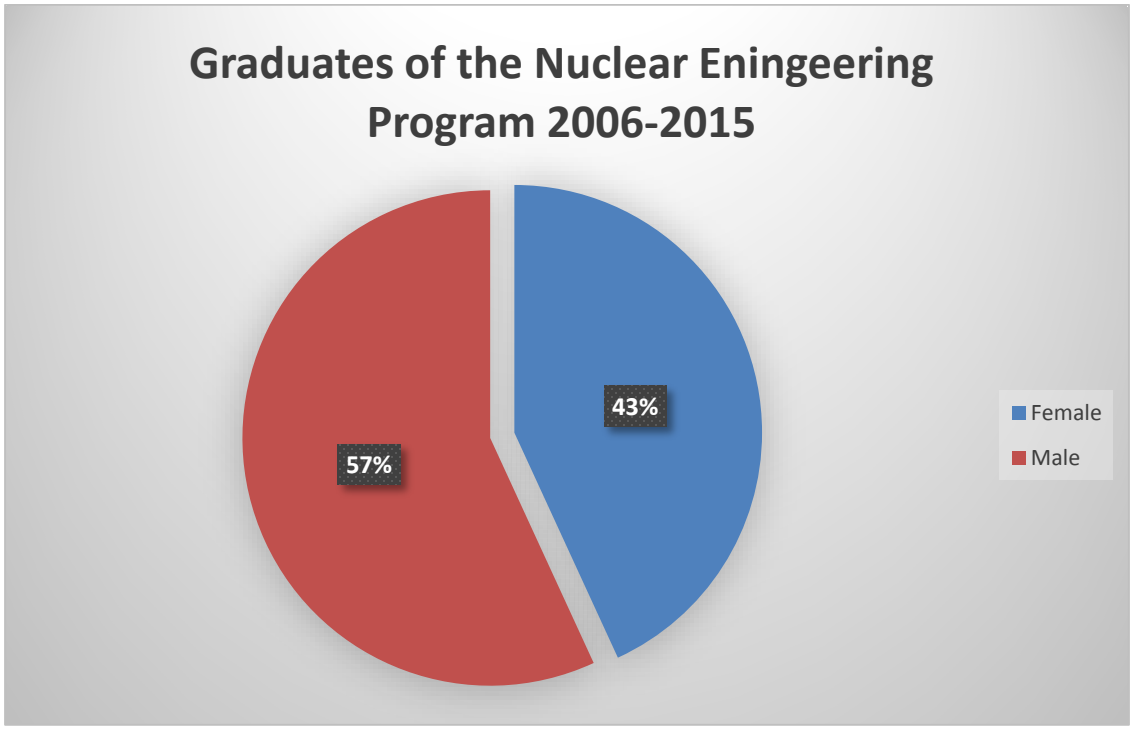
NOTE: Data include unclassified undergraduate students. Data through 1995 are for institutions of higher education, while later data are for degree-granting institutions. Degree-granting institutions grant associate's or higher degrees and participate in Title IV federal financial aid programs. The degree-granting classification is very similar to the earlier higher education classification, but it includes more 2-year colleges and excludes a few higher education institutions that did not grant degrees. Projections are based on data through 2013. Some data have been revised from previously published figures.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), "Fall Enrollment Survey" (IPEDS-EF:90-99); IPEDS Spring 2001 through Spring 2014, Enrollment component. See *Digest of Education Statistics 2014*, table 303.70.

Based on information obtained from the WEB pages of Clemson University and University of South Carolina Colleges of Engineering, each school ***enrolls*** about 23% females in their respective colleges of Engineering. However from its lone Engineering program, South Carolina State University has ***graduated*** over 43% females in its classes since 2006, and about one third of these continue on to advanced degree programs in Engineering. Photos 1 and 2 below show the two largest graduating classes in Nuclear Engineering to date. In the class of May 2011, one third of the graduates (including the top graduate) were females; in the class of May, 2014, two thirds of the class were females, three of whom graduated with highest honors.

Photo1. SC State Nuclear Engineering Graduating Class, May 2011.
Class composition: five African American males, three African American females. One female is from Atlanta, one is from Maryland, and the third is from Orangeburg, S.C.

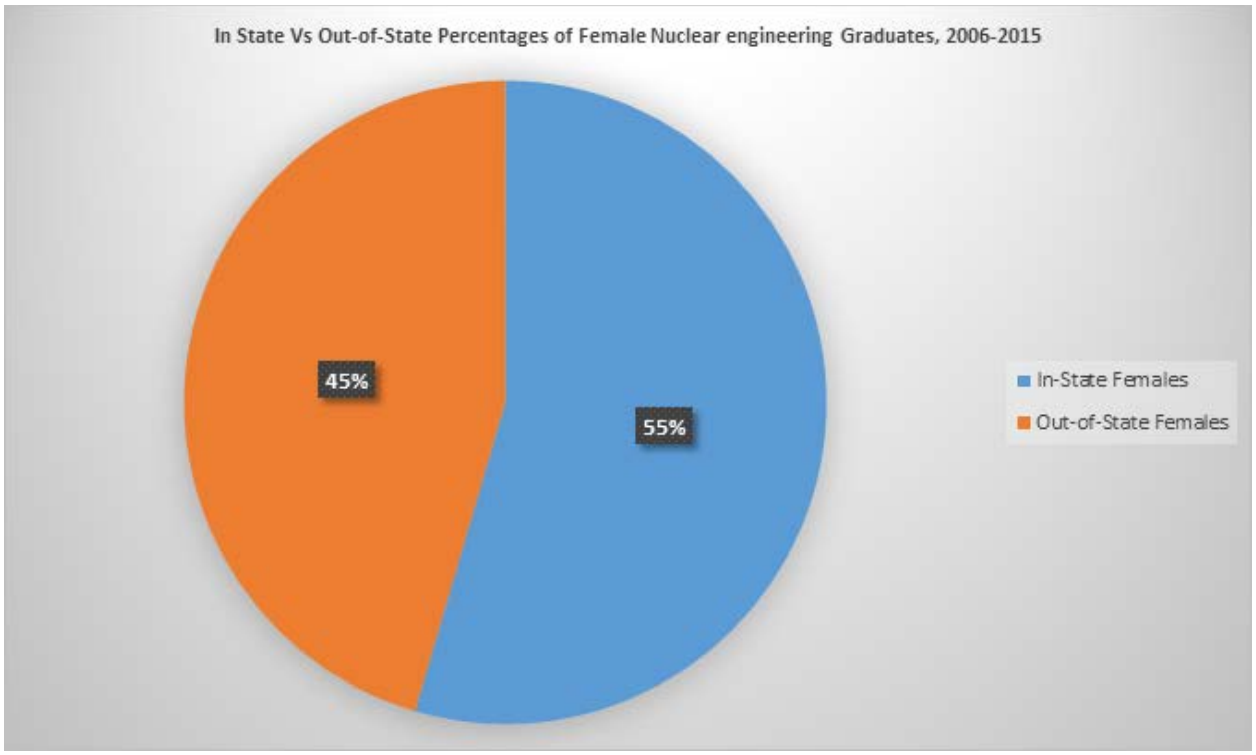
Photo 2. SC State Nuclear Engineering Graduating May, 2014
Class Composition: 6 African American Females, 2 foreign nationals, 1 African American Male.
3 of these females are from the state of Georgia, 2 from South Carolina, 1 from North Carolina.

The chart below shows the overall percentage of female and male graduates since the Nuclear Engineering program produced its first graduate in 2006. Males did not outnumber Females until the class of 2015.



A deliberate effort is made by the Nuclear Engineering program to recruit women with high math aptitudes into the Nuclear Engineering program, and this same effort will be made to recruit women into the Civil Engineering program. In fact, in recent years, the top performing students in the Civil Engineering Technology program have been females (2006, 2008, 2010, 2011, 2014).

The chart below shows the relative percentages of in-state female Nuclear Engineering graduates to those from out-of state. The largest out-of-state group of female graduates is from the state of Georgia (4), mainly from the Augusta area. SC State participates in Augusta's CSRA College Night event every year. This major recruiting event typically draws 6000-8000 high school seniors and juniors, and has been fertile ground for garnering very strong students. The second largest out-of-state group is from the state of North Carolina (2). SC State has a yearly presence at the Campus Connections pre-college program, which is held in late summer in Charlotte, North Carolina.



Recruiting "Legacy" Students and African American Students from South Carolina Who Are Choosing to Study at NC A & T, FAMU, or Tuskegee University over South Carolina Universities

One of the major arguments made by "legacy" students and native African American South Carolina students who would otherwise attend South Carolina State is that a full Engineering program (other than Nuclear) did not exist at this university. With the recent approval to offer Industrial Engineering, the inclusion of a Civil Engineering program at South Carolina State will undoubtedly reverse the trend of native students seeking to major in Engineering from selecting North Carolina A & T, Florida A & M, and Tuskegee Universities. African American students opting to attend these out-of-state schools generally do not desire to attend either Clemson or South Carolina, even though they may have been recruited and/or admitted to these schools. Thus, South Carolina State University would now provide the in-state alternative for such students. In recent experience, this amounts to 1-2 well-qualified students per year from Orangeburg-Wilkinson High School alone.

| a new state of mind

Office of the Provost

July 14, 2015

Dr. Bettie Rose Horne, Chair
Committee on Academic Affairs and Licensing
SC Commission on Higher Education
1122 Lady Street, Suite 300
Columbia, SC 29201

Dear Dr. Horne,

This correspondence certifies that the President and the Board of Trustees approves the Program Modification transitioning the Civil Engineering Technology Program at SC State University to a baccalaureate degree in Civil Engineering. The University is appreciative of the support given by the Commission on Higher Education for the recent modification of the Industrial Engineering Technology Program to a baccalaureate degree in Industrial Engineering.

Thank you for your continued support of South Carolina State University.

Sincerely,

Learie Luke

Learie Luke, Ph.D.
Acting Provost

Approved:

W Franklin Evans

W. Franklin Evans, Ph.D.
Acting President

Charles S. Way Jr.

Charles S. Way, Jr.
Chairman, Board of Trustees

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