

Program Planning Summary

1. COVER PAGE

a) Name of Institution - University of South Carolina Aiken

b) Name of Degree – Industrial Process Engineering

c) Date of Submission – January 27, 2014

d) Institutional Signatures

Harris Pastides, President

Date

Sandra Jordan, Chancellor

Date

e) Contact – Dr. Jeffrey M. Priest
Executive Vice Chancellor for Academic Affairs
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2. **CLASSIFICATION**

- a) Program Title** – Bachelor of Science in Industrial Process Engineering
- b) Concentrations/Options/Tracks** – None
- c) Designation, Type, and Level of Degree** – 4-year, Baccalaureate
- d) Proposed Date of Implementation** – Fall 2015
- e) Program Qualifications** – Qualifies for supplemental Fellows Scholarship and Life Scholarship
- f) CIP Code** – 14.3501
- g) Delivery Mode** – Traditional

3. **JUSTIFICATION**

a) Need

Over the past several years Aiken County has developed into a technology center for business and government. The listing of businesses in the area that depend on technology include Savannah River National Laboratory, Savannah River Nuclear Solutions, Savannah River Remediation, Tognum America Inc., BAE Systems, South Carolina Gas and Electric; Kimberly-Clark's Consumer Health Services; Bridgestone Passenger and Truck Tire Facility; AGY Materials Corporation; Shaw Industries; Washington Safety Management Solutions Corporation; and Hubbell Power Systems. Collectively these industries employ over 16,000 individuals and each industry is driven by its technology innovations, which come from the employment of its engineering and scientific staff. Governor Haley has made preparing students for careers in the STEM fields, particularly engineering a priority.

In fall 2012, the University of South Carolina Aiken (USCA) conducted a visioning process that involving over 700 stakeholders in the region. Through this process every constituent group (students, faculty, administrators, business/industry, community leaders) identified engineering as a priority for a new degree program. Businesses and individuals have already pledged more than \$500,000 to support the program.

b) Relationship Existing Programs Within the Institution:

For the past 25 years USC Aiken has offered the freshman and sophomore years of a general engineering program that enabled students to transfer to USC Columbia or other engineering programs throughout the state. The proposed program will allow those students who so choose to complete an engineering degree at USC Aiken or transfer as in the past. Therefore the proposed program is adding the junior and senior years to an already existing program.

c) Assessment of the extent proposed program duplicates existing programs within the state:

Currently Clemson University is the only ABET accredited institution in the state that offers Industrial Engineering. Francis Marion University was just approved for an Industrial Engineering program this past year. Of the two programs, Francis Marion's program is of similar size and scope. However because of the geographic distance between our campuses and the emphasis of regional recruitment, we don't believe we will be in direct competition. There are no other similar programs in the state.

4. **PROGRAM DEMAND AND PRODUCTIVITY**

a) Anticipated Enrollment

Currently there are approximately 100 pre-engineering majors attending USC Aiken. This number has been consistent over the past five years. Although we believe once a major is approved the numbers will increase, for cost estimates, we conservatively have estimated that the number in the program from year to year will remain approximately 100 students.

b) Anticipated Annual Completions

It is anticipated that by the end of year 4, twelve (12) students will graduate from the proposed engineering program. We conservatively estimate that this number will remain constant into the future.

5. EMPLOYMENT OPPORTUNITIES FOR GRADUATES

In the fall 2012, USCA hired Carnegie Communications to do a productivity demand study and an environmental scan for a series of possible degree programs, one of which was engineering. According to the study, which drew heavily from the Bureau of Labor Statistics Occupational Employment Statistics Classification system, over the next 10 years, 68,000 new engineering jobs and 38,000 replacement jobs will become available. In the Central Savannah River Area, the Carnegie study indicates that there will be an estimated 333 engineering job openings (114 new, 219 replacement). Potential employers for our graduates will be URS Corporation, Savannah River Remediation, Energy Solutions, BUNTY LLC Engineered Solutions, Savannah River Nuclear Solutions, Southeastern Clay Company, Kimberly Clark, Bridgestone Tire, AGY Materials, Shaw Industries, and Tognum America, to name a few.

A job search conducted on November 8, 2013 through Careerbuilder.com indicates more engineering related job openings as predicted by the Bureau of Labor Statistics. A search on that website yielded the following results:

Job Prompt	CSRA	South Carolina	Georgia	North Carolina
Industrial Engineer	8	181	270	171
Process Engineer	39	415	879	466
Mechanical Engineer	19	211	269	173

6. CURRICULUM

General Education Requirements

- English 101, 102 (6 credits)
- Math 141, 142, 241, 242 – Calculus I, II, III, Differential Equations (16 credits)
- Chemistry 111, 112 – General Chemistry I & II (8 credits)
- Physics 211, 212 – Physics I & II (8 credits)
- Humanities – PHIL 325 Engineering Ethics (3 credits), electives (6 credits)
- COMM 241 or 201 – Public Speaking or Interpersonal Communication (3 credits)
- Social/Behavioral Sciences - ECON 421 – Engineering Economics & Finance (3 credits)
Elective (3 credits)
- APLS 201 or HIST 201/202 – American Institutions (3 credits)
- HIST 101/102 – World Civilization (3 credits)
- AFCI 101 – Critical Inquiry (1 credit)

ENGINEERING Requirements

- ENCP 101, 200, 210, 290,260 – Intro to Engineering, Statics, Dynamics, Thermodynamic Fundamentals, Intro to the Mechanics of Solids (15 credits)
- ELCT 101 – Intro to Electrical Engineering (3 credits)
- EMCH 327, 345, 354, 360 – Design of Mechanical Elements; Instrumentation, Measurement, & Statistics; Heat Transfer; Fluid Mechanics (12 credits)
- ESYS 3XX – Introduction to Systems Engineering (3 credits)

ENGR 30x, 31x, 32x, 4xx, 498, 499 – Engineering Business Tools and Quality Engineering; Instrumentation and Control Systems; Materials Science; Unit Operations; Capstone Design I & II (24 credits)

BADM 371 – Principles of Management and Leadership (3 credits)

MGMT 475, 494 – Production/Operations Management; Project Management (6 credits)

Starting with the summer after the freshman year and continuing through the summer of the junior year, to provide real world experience, internships will be made available through our local business and industry partnerships. As per ABET accreditation guidelines, USC Aiken will pursue ABET accreditation once it graduates its first students.

7. ARTICULATION AND INTER-INSTITUTIONAL COOPERATION

Because of the general nature of the first two years of the program, students who successfully complete the program will be able to transfer, as they have for the past 25 years, into one of the engineering programs at USC Columbia. USC Aiken is pursuing a MOU with Aiken Technical College to enable those students in their engineering program to transfer into the proposed program.

8. ESTIMATE OF COSTS

ESTIMATED COSTS BY YEAR					
CATEGORY	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Program Administration	45,720	47,090	48,500	49,960	51,460
Faculty Salaries*	407,250	544,560	560,470	577,470	594,830
Part-Time Faculty Salaries	15,000	15,480	15,960	16,440	16,920
Clerical/Support Personnel	14,980	15,430	15,890	16,370	16,860
Supplies and Materials	100,000	125,630	128,770	131,990	135,290
Library Resources	66,350	68,010	69,710	71,450	73,230
Equipment	345,000	51,250	52,530	53,840	55,190
Facilities	50,000	50,000	-	-	-
TOTALS	1,044,300	917,450	891,830	917,520	943,780
SOURCES OF FINANCING BY YEAR					
Tuition Funding	765,720	897,400	928,000	958,600	990,220
Program-Specific Fees	27,750	35,850	35,850	35,850	35,850
State Funding*	-	-	-	-	-
Reallocation of Existing Funds**					
Federal Funding	-	-	-	-	-
Other Funding (Specify)***	250,830				
TOTALS	1,044,300	933,250	963,850	994,450	1,026,070
FUND BALANCE IMPACT	-	15,800	72,020	76,930	82,290

Includes a new faculty line for 2015-2016 and another new faculty in 2016-2017