NEW PROGRAM PROPOSAL

Name of Institution
University of South Carolina Beaufort

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

Program Designation

- ☐ Associate's Degree
- ☒ **Master's Degree**
- ☐ Bachelor's Degree: 4 Year
- ☐ Specialist
- ☐ Bachelor's Degree: 5 Year
- ☐ 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 2018** CIP Code **30.3001**

Delivery Site(s)
Historic Beaufort Campus (HB) - 50901
Hilton Head Gateway Campus (HHG) - 50903

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. Yiming Ji, Professor and Program Coordinator, 843-208-8216, yimingji@uscb.edu

Institutional Approvals and Dates of Approval

Evaluating Unit	Approval Date
Department Chair	8-1-2016
Academic Affairs Council – Executive Vice Chancellor for Academic Affairs	8-24-2016
USCB Courses & Curricula Committee	9-2-2016
USCB Faculty Senate Chair	9-23-2016
USCB Chancellor	
USC system President	
USC Board of Trustees	

NEW PROGRAM PROPOSAL

Background Information

State the nature and purpose of the proposed program, including target audience and centrality to institutional mission. (1500 characters)

The goal of the proposal is to develop a Master of Science degree program in Computational Science (CSci) at the University of South Carolina Beaufort (USCB). The program is designed to respond to regional needs, to train students with an advanced knowledge in CSci, and to prepare them to contribute to various science research and industry fields locally and nationally.

CSci is a field of applied Computer Science (CS) in which computing theories and software techniques are used to serve and advance many diverse fields, including science, engineering, social science and business. CSci is considered to be "central to the Nation's long-term technical leadership" (Computational Science: Ensuring America's Competitiveness, President's Information Technology Advisory Committee, 2005). CSci is also one of the most critical science fields for the High Performance Computing ecosystem (National Strategic Computing Initiative Strategic Plan, The National Strategic Computing Initiative Executive Council, July 2016).

The program will draw students from the Lowcountry, across the state of South Carolina, from around the country, and from around the world. It will continue with the success of the current baccalaureate degree in CSci—which has grown to over 100 students in only six years—and serve a racially and culturally diverse student body, including military personnel, veterans and their dependents. The program will spur the creation and deployment of cutting edge computing technology in the region; the program will also produce graduates who not only have a broad foundation in the advanced computing concepts and methods but who will possess the cutting-edge computational and quantitative skills that will allow them to participate in the extension of scientific thought and knowledge.

The program will increase the number and diversity of scientists and technicians well trained for careers in new technologically oriented industries in South Carolina.

List the program objectives. (2000 characters)

1) Develop and offer modern curricula for a master's degree program in CSci,
    a. Offer students with advanced training in the CSci and significant exposure to other science and engineering fields.
    b. Prepare students for careers in broad areas that require extended proficiency in programming, modeling, computing, and software system management.
    c. Foster a cutting-edge practice for the process of how the Mathematics, Computer Science and other areas of science and engineering would integrate meaningfully and impact our everyday lives and the future of the natural world.
    d. Provide much needed opportunities for interaction with the local citizenry concerning advancing computer and/or computing technologies through formal classroom instruction, internships, seminars and informal educational opportunities at local events.
2) Enhance research infrastructure and develop state-of-the-art research opportunities in CSci at USCB, and engage students in graduate research programs in order to prepare them for careers in CSci fields.
3) Implement a degree program that will, by Fall 2021, have at least 18 students enrolled to be trained in CSci.

Assessment of Need

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

The need for a M.S. Computational Science program is driven by two main factors, including:

1) Science leadership and national security. According to the reports "Computational Science: Ensuring America's Competitiveness" by the President's Information Technology Advisory Committee (June, 2005) and the "National Strategic Computing Initiative Strategic Plan" (NSCISP) by the National Strategic Computing Initiative Executive Council (July, 2016), CSci is "critical to scientific leadership, economic competitiveness, and national security" and it is "one of the most important technical fields of the 21st century". Unfortunately, "only a small fraction of the potential of CSci is being realized, thereby compromising U.S. preeminence in science and engineering". In fact, according to the Association of American Geographers, and Society for Industrial and applied Mathematics, only five (5) (or 50%) of the southeastern ten (10) states offer graduate programs in CSci, and only two (2) (or 20%) of them offer undergraduate program in CSci (including USCB). Our existing undergraduate program at USCB has been very successful to train students to understand basic computing technologies and to work in software engineering fields; however, it is not yet ready for them to lead the field at the forefront. For this reason, the proposed M.S. program is specially designed to enable those students who have already hold a B.S. degree in a science or engineering discipline to gain advanced knowledge and research experience that are much needed for them to become successful computational scientists outlined by the NSCISP. Consequently, the CSci M.S. program is a decisive step toward the realizing of the potential of computing, the advancing of the science leadership, and the ensuring the national security at the state of South Carolina.
2) Promote science education and increase the number and diversity of scientists and technicians in the state of South Carolina and especially the Lowcountry region. The development of the graduate Computational Science proposal has been steadily focusing on how changes and growth are centrally related to the USCB mission statement, including 1) public service to the region, the state and the globe, 2) promoting knowledge, and 3) diversity. Our present CSci undergraduate program serves many students from rural, impoverished homes, and among them, 20% of them are female and collectively 40% are underrepresented minorities (specifically 12% Hispanic, 2% American Indian, and 26% African American, based on fall 2015 statistics). We expect the diversity of the graduate program will be similar to that of the current undergraduate program.

Employment Opportunities

Is specific employment/workforce data available to support the proposed program?

☒**Yes**

☐No

If yes, complete the table and the component that follows the table on page 4. If no, complete the single narrative response component on page 5 beginning with "Provide supporting evidence."

Employment Opportunities			
Occupation	**Expected Number of Jobs**	**Employment Projection (by 2024)**	**Data Source**
Computer and Information Research Scientists*	25,600	28,300 (or 11% ↑)	US Bureau of Labor Statistics * typical entry-level education requires doctoral or professional degree
Software developers, applications	718,400	853,700 (or 19% ↑)	
Computer systems analysts	567,800	686,300 (or 21% ↑)	
Database administrators	120,000	133,400 (or 11% ↑)	
Information security analysts	82,900	97,700 (or 18% ↑)	
Web developers	148,500	188,000 (or 27% ↑)	

Provide additional information regarding anticipated employment opportunities for graduates. (1000 characters)

In addition to the exceptional employment opportunities itemized in the above table, the state of South Carolina, especially the Lowcountry area, also offers tremendous employment opportunities for CSci graduates. According to the SC Works Online Services, increase of CSci related occupations in "*Software developers, applications*" in Lowcountry area is projected to grow by 37% from 2012-22 (https://lmi.dew.sc.gov/lmi%20site/CommunityProfiles.html, community profile, page 24), which is much higher than the national projection (19%, 2014-24, see also the above table) in the same category (US Bureau of Labor Statistics). It is true that typical entry-level education required for most computer and computational science and information technology occupations is a bachelor's degree; a master's degree does make positive impact on careers, especially for high technology companies including Apple, IBM, and Microsoft. Most importantly, a master's degree generally helps graduates get a boost in salary, according to ConcordiaOnline "benefits and statistical trends in master degree programs" and Quartz "why all programmers should earn their master's", starting salaries "*with a master's degree can be as much as $17,000 more a year compared to those with a bachelor's degree"*.

The current economy of the Lowcountry region is based heavily on agriculture and the hospitality/tourism industry, both of which rely primarily on low paying jobs. The average income in Jasper, Colleton and Hampton counties ($34,840, year 2014) is well below both the state ($45,033) and national averages ($53,482) (US Census Bureau). Among many possible parameters that would influence the economy, it is not difficult to identify one particular parameter – education – that plays a critical role for the economy's performance. In fact, the percent of persons at age 25 years and above who own a bachelor's degree or higher is very low in these districts (i.e., Colleton – 14.1%, Hampton – 11.1%, and Jasper – 13.0%, while the state is 25.3% and the nation is 29.3%, 2010-2014, US Census Bureau). Consequently, as a senior public university in one of the fastest job growth states in US (http://www.kiplinger.com/), the development of a new graduate program in CSci at USCB will provide many fellow citizens the opportunity to receive advanced education, to pursue high paying jobs in the state, and to help revitalize Lowcountry economy.

Provide supporting evidence of anticipated employment opportunities for graduates, including a statement that clearly articulates what the program prepares graduates to do, any documented citations that suggests a correlation between this program and future employment, and other relevant information. Please cite specific resources, as appropriate. (3000 characters)

Note: Only complete this if the Employment Opportunities table and the section that follows the table on page 4 have not previously been completed.

Will the proposed program impact any existing degree programs and services at the institution (e.g., course offerings or enrollment)?

☒**Yes**

☐No

If yes, explain. (500 characters)

The proposed graduate Computational Science program will be an independent, and one of the first graduate, program(s) of study at USCB. It will further integrate and advance interdisciplinary research and collaboration between CSci and other programs in the institution. First, it will definitely enhance our current undergraduate CSci program because it will open a door for many undergraduate students to participate in research projects with graduate students, and it will also provide great opportunities for undergraduate students to select more advanced courses during their senior years. Second, due to the interdisciplinary nature of CSci, this graduate program will expand its present interaction with Mathematics, Biology, Finance, Information Management, and other science fields in the institution. It would not be a surprise that a variety of graduate programs would be developed in the near future because of the interdisciplinary collaborations with this proposed program.

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List of Similar Programs in South Carolina

Program Name	Institution	Similarities	Differences
M.S. Computer and Information Sciences	Citadel/College of Charleston	1. 30~33 credit-hour program that focuses on theory and application aspects of computer science, information technology, software engineering, and cybersecurity 2. Offer three degree options, including non-thesis, project thesis, and research thesis	Proposed M.S. Computational Science at USCB focuses more on the applied side of computer science. i.e., CSci concentrates on computational methods, modeling and simulation, applied statistics, data analytics, visualization systems, and database techniques. More importantly, CSci integrates these computing theories and techniques with software engineering applications and solves problems in other science and engineering fields.
M.S. Computer Science	Clemson	1. 30 credit-hour program that focuses on theory and application aspects of computer science, computing, visualization, information technology, and software engineering 2. Require M.S. thesis research	
M.S. Computer Science	Charleston Southern University	1. 33 credit-hour program that focuses on theory and application aspects of computer science 2. offer both thesis track and non-thesis track	
M.S./M.S.E. Computer Science and Engineering	USC-Columbia	1. 30 credit-hour program that focuses on theory and application aspects of computer science and/or software engineering 2. M.S. in Computer Science requires a thesis	
M.S. Information Systems Technology	Coastal Carolina University	1. 33 credit-hour program that focuses on information security and data analytics 2. offer both thesis track and non-thesis track	
M.S. Information Systems	South University	1. interdisciplinary field of study that integrate Business Management and Information systems	1. MS Information Systems at South University requires 48 credit-hour of study.

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Description of the Program

Projected Enrollment						
Year	Fall		Spring		Summer	
	Headcount	Credit Hours	Headcount	Credit Hours	Headcount	Credit Hours
2018-19	6	54	8	72	8	24
2019-20	14	126	14	126	12	36
2020-21	18	162	18	162	12	36
2021-22	20	180	20	180	14	42
2022-23	20	180	20	180	14	42

Besides the general institutional admission requirements, are there any separate or additional admission requirements for the proposed program?

☒Yes

☐No

If yes, explain. (1000 characters)

Besides the general institutional admission requirements, application will also require:

1) Scores from the general Graduate Record Examination (GRE), with Quantitative scores of 155 or higher and verbal of 145 or higher;
2) Transcripts of all prior academic work, with a GPA of at least 3.0 on a 4.0 scale;
3) Two letters of recommendation, preferably from prior professors;
4) A resume listing relevant work experience, publications, and projects; and
5) For candidates from non-English speaking countries who have not studied in the United States for at least one year, the scores from the Test of English as a Foreign Language (TOEFL) (80 or higher) or the International English Language Testing Systems (IELTS) (6.5 or higher).

Are there any special articulation agreements for the proposed program?

☐Yes

☒**No**

If yes, identify. (1000 characters)

NEW PROGRAM PROPOSAL

Curriculum

Select one of the following charts to complete: Curriculum by Year **or Curriculum by Category**

Curriculum by Year					
Course Name	**Credit Hours**	**Course Name**	**Credit Hours**	**Course Name**	**Credit Hours**
Year 1					
Fall		**Spring**		**Summer**	
Total Semester Hours		Total Semester Hours		Total Semester Hours	
Year 2					
Fall		**Spring**		**Summer**	
Total Semester Hours		Total Semester Hours		Total Semester Hours	
Year 3					
Fall		**Spring**		**Summer**	
Total Semester Hours		Total Semester Hours		Total Semester Hours	
Year 4					
Fall		**Spring**		**Summer**	
Total Semester Hours		Total Semester Hours		Total Semester Hours	

NEW PROGRAM PROPOSAL

Curriculum by Year					
Course Name	**Credit Hours**	**Course Name**	**Credit Hours**	**Course Name**	**Credit Hours**
Year 5					
Fall		**Spring**		**Summer**	
Total Semester Hours		Total Semester Hours		Total Semester Hours	

NEW PROGRAM PROPOSAL

Curriculum by Category*			
Mathematics and Statistics (3 hrs required)			
Choose one:	CSCI 540/STAT 540	Advanced Statistical Methods	3 hrs
	OR		
	CSCI 580/MATH 580	Applied Mathematics for Computational Scientists	3 hrs
Core Courses (12 hrs required)			
Required courses:	CSCI 526	Computational Methods for Scientists	3 hrs
	CSCI 550	Computational Modeling for Scientists	3 hrs
	CSCI 566	Data Visualization	3 hrs
	CSCI 569	High Performance Computing	3 hrs
Electives (9 hrs required)			
	CSCI 515	Topics in Computational Science	3 hrs
	CSCI 516	Data Communications and Networking	3 hrs
	CSCI 520	Advanced Topics in Database Systems	3 hrs
	CSCI 522	Data Mining	3 hrs
	CSCI 567	Computational Imaging	3 hrs
	CSCI 570	Software Systems Design and Implementation	3 hrs
	CSCI 599	Independent Study	1-3 hrs
	CSCI 601	Principles of Computer Security	3 hrs
	CSCI 622	Data Management and Analytics	3 hrs
	CSCI 699	Industrial or research Internship	3 hrs
Thesis or Research Option (6 hrs required)			
Choose one:	CSCI 797	Research	3-6 hrs
	OR		
	CSCI 799	Thesis or Project	3-6 hrs
TOTAL PROGRAM HOURS			30 hrs

* Add category titles to the table (e.g., major, core, general education, concentration, electives, etc.)

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Total Credit Hours Required

Course Descriptions for New Courses

Course Name	Description
CSCI/STAT 540 Advanced Statistical Methods	Methods of data description and analysis, regression and spectral techniques, graphical presentation, estimation and forecasting. Statistical software will be used throughout the course.
CSCI 580/MATH 580 Applied Mathematics for Computational Scientists	Application of tools and techniques to algorithmic problems arising in discrete applied math. Topics include probabilistic methods, entropy, linear algebra methods, risk analysis, approximation and optimization techniques, and performance analysis.
CSCI 515 Topics in Computational Science	Selected topics in computational science.
CSCI 526 Computational Methods for Scientists	Application of mathematical, science, and engineering problems to software engineering. Introduction of computing systems including UNIX/LINUX.
CSCI 550 Computational Modeling for Scientists	Introduction of computational tools, models, system dynamics, input and output analysis, and performance analysis.
CSCI 566 Data Visualization	Advanced techniques and algorithms for creating effective visualizations based on principles from graphic design, visual art, perceptual psychology, and cognitive science.
CSCI 469/569 High Performance Computing	Introduction of the design, analysis, and implementation of high performance computational science and engineering applications using advanced computer architectures, parallel algorithms, parallel languages, and performance-oriented computing facilities.
CSCI 416/516 Data Communications and Networking	Advanced topics in data communications, architecture, communication protocols, topologies, network access control, LANs, MANs, and WANs; internetworking.
CSCI 520 Advanced Topics in Database Systems	Advanced data-processing techniques, software, database design, implementation, and manipulation.
CSCI 422/522 Data Mining	Concepts, issues, tasks and techniques of data mining. Topics include data preparation, feature abstraction, association, classification, clustering, evaluation and validation, scalability, spatial and sequence mining, and data mining applications.
CSCI 567 Computational Imaging	Computational techniques in image processing and analysis.
CSCI 470/570 Software Systems Design and Implementation	Techniques involved in the planning and implementation of real-life software systems. Topics include software planning, design, implementation, testing, and documentation.
CSCI 601 Principles of Computer Security	Principles and practices of computer system security including operating system security, network security, software security and web security.
CSCI 622 Data Management and Analytics	Foundations of data analytics. Concepts and skills for relational data modeling, querying, and management.
CSCI 797 Research	Research in computational science.
CSCI 799 Thesis or Project	Preparation of a project or thesis for the master's degree.

NEW PROGRAM PROPOSAL

Faculty

Faculty and Administrative Personnel				
Rank	**Full- or Part-time**	**Courses Taught or To be Taught, Including Term, Course Number & Title, Credit Hours**	**Academic Degrees and Coursework Relevant to Courses Taught, Including Institution and Major**	**Other Qualifications and Comments (i.e., explain role and/or changes in assignment)**
Professor	Full-time	• Computer Science • Computational Science • Computational Engineering	• Ph.D. in Computer Science and Engineering • M.S. in Engineering	Taught CS/CSci courses since spring 2006
Associate Professor	Full-time	• Computer Science • Computational Science • Computational Engineering	• Ph.D. in Integrative Biosciences • Graduate minor in Computational Science	Taught CS/CSci courses since spring 2011
Associate Professor	Full-time	• Computer Science • Computational Science • Applied Statistics	• Ph.D. in Computer Science • M.S. in Applied Statistics • M.E. in Computer Engineering	Taught CS/CSci courses since fall 2011
Associate Professor	Full-time	• Mathematics	PhD in Applied Mathematics	Taught Math courses since fall 2013
Assistant Professor	Full-time	• Computer Science • Computational Science	• Ph.D. in Computer Science and Engineering	Taught CS/CSci courses since fall 2016
Assistant/Associate Professor*	Full-time	Computational Science	• Ph.D. in Computational Engineering	To be hired in fall 2017
Assistant/Associate Professor*	Full-time	Computational Science	• Ph.D. in Computer/Computational Science	To be hired in fall 2018
Assistant/Associate Professor*	Full-time	Computational Science	• Ph.D. in Computer/Computational Science	To be hired in fall 2020

Note: Individuals should be listed with program supervisor positions listed first. Identify any new faculty with an asterisk next to their rank.

Total FTE needed to support the proposed program (i.e., the total FTE devoted just to the new program for all faculty, staff, and program administrators):

Faculty	2.16	Staff	0.25	Administration	0.33

Faculty /Administrative Personnel Changes

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

There will be three new faculty hires for the program. Assistant/Associate Professor 6 will be hired in fall 2017, Assistant/Associate Professor 7 will be hired in fall 2018, and Assistant/Associate Professor 8 will be hired in fall 2020. Assistant/Associate Professors 6 and 7 will devote 2/3 of their time to teaching in the MS program and Assistant/Associate Professor 8 will devote 1/3 of his/her time to teaching in the MS program, with the remaining portions of their time dedicated to the undergraduate Computational Science program. All other CSci courses will be taught by qualified, existing full-time faculty who already teach in the B.S. in CSci program—approximately .5 FTE total commitment to the MS program. As the program grows, adjunct and full-time faculty will be added. All new adjunct and instructor hires will have, at a minimum, a Master's degree in CS, CSci, or a closely related field. Tenure-track faculty will be terminally degreed.

The Program Coordinator for the B.S. in CSci, reporting to the Chair of the Department of Mathematics and Computational Science, will be appointed to manage the day-to-day operations of the M.S. in CSci degree program. The Program Coordinator will serve in a 1/3 administration and 2/3 teaching role.

Library and Learning Resources

Identify current library/learning collections, resources, and services necessary to support the proposed program and any additional library resources needed. (1000 characters)

USCB offers a rich array of resources, including 91,000+ books on campus, 500,000+ E-books, subscriptions to over 100 databases, and the availability of 200,000+ online journals in all discipline areas. Also through comprehensive interlibrary loan services and delivery systems through regional consortia, USCB provides access to rich resources available nationwide. In SC alone, by being a member of PASCAL, students and faculty have access to over 9 million books and other academic materials. USCB also is a member of KUDZU, a group of 17 southeastern university research libraries that shares resources among its members. Specifically relating to the proposed degree track, USCB has over 4,457 monographs with titles in mathematics/computer science [LC call number range QA1-939], cybernetics/information theory [Q300-390] and mathematical geography [GA1-116]. The USCB Library also provides full-text access (either online, in print or both) to all of the professional journals recommended by Magazines for Libraries (23rd ed.) as basic core serials specific to the needs of mathematics, and 83% specific to computers and information technology. Additional resources will be purchased to broaden and deepen the libraries holdings in these areas.

Student Support Services

Identify academic support services needed for the proposed program and any additional estimated costs associated with these services. (500 characters)

Student support services, programs, and activities are available to students taking courses on the Historic Beaufort (HB) campus, on the Hilton Head Gateway (HHG) campus, and via distance education. Because the services are already in place, there are no other associated costs. These services include computer support, Career Services, Counseling and Disability Services, libraries, and the Student Success Center (academic advising, tutoring, and the Writing Center).

Physical Resources

Identify any new instructional equipment needed for the proposed program. (500 characters)

Startup equipment for new faculty in fall 2017, 2018 and 2020 will be needed. Colfax CX2455i-X5 2U Rackmount Server with 4x Inter Xeon Processors E5-4600 series and a Dell PowerVault MD 3860f storage server are planned to build research infrastructure in year 2 (2019-20). Upgrades of already existing faculty/student research and/or lab computers is planned in year 3 (2020-21), year 4 (2021-22), and year 5 (2022-23). Computer maintenance, research and general supplies, library materials, and software purchases and licenses will be purchased as needed.

Will any extraordinary physical facilities be needed to support the proposed program?

☐Yes

☒**No**

Identify the physical facilities needed to support the program and the institution's plan for meeting the requirements, including new facilities or modifications to existing facilities. (1000 characters)

No additional physical plant requirements or modifications to existing facilities are needed.

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Financial Support

Estimated New Costs by Year						
Category	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Total**
Program Administration	-	-	-	-	-	-
Faculty and Staff Salaries	70,877	135,504	135,504	167,818	167,818	677,522
Graduate Assistants	19,200	19,200	28,800	28,800	28,800	124,800
Equipment	12,000	90,000	28,000	18,000	8,000	156,000
Facilities	-	-	-	-	-	-
Supplies and Materials	12,000	12,000	12,000	12,000	12,000	60,000
Library Resources	2,000	2,000	2,000	2,000	2,000	10,000
Other*	-	-	-	-	-	-
Total	116,077	258,704	206,304	228,618	218,618	1,028,322
Sources of Financing						
Category	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Total**
Tuition Funding	79,988	158,112	203,400	233,964	240,798	976.952
Program-Specific Fees	-	-	-	-	-	-
State Funding (i.e., Special State Appropriation)*	-	-	-	-	-	-
Reallocation of Existing Funds*	-	-	-	-	-	-
Federal Funding*	131,268	155,542	138,857	95,972	-	521,639
Other Funding*	-	-	-	-	-	-
Total	211,256	313,654	342,257	329,936	240,798	1,437,901
Net Total (i.e., Estimated New Costs Minus Sources of Financing)	95,178	54,950	135,953	101,318	22,180	449,579

*Provide an explanation for these costs and sources of financing in the budget justification.

NEW PROGRAM PROPOSAL

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.

There are no plans for "other new costs".

In addition, USCB is a member in the South Carolina EPSCoR (Track 1 RII) grant application to the National Science Foundation, and it is expected that the proposed CSci program will receive about $180,000 per year from year 1 to year 4 (2018-22). Only direct costs associated with the MS CSci program have been included in the Sources of Financing. Other funding will be generated through tuition and fees.

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Evaluation and Assessment

Programmatic Assessment: Provide an outline of how the proposed program will be evaluated, including any plans to track employment. Identify assessment tools or software used in the evaluation. Explain how assessment data will be used. (3000 characters)

Achievement of student learning outcomes will be assessed using a number of measurable assessments:

1) Direct assessment methods, which include critiques, project evaluations, research papers, assignments, oral exams, grading rubrics, and standardized tests, will be used to assess student learning outcomes.

- Students in the program must maintain a GPA of 3.0 or higher to remain in good academic standing.
- Semester and annual reviews of students' academic progress, which include course theory, assignments, projects, thesis research, and/or internship programs.

2) Indirect assessment methods, which include focus groups, exit and other interviews, graduation rates, transfer rates, interviews, written surveys and questionnaires to include student perception, the Rising Junior Survey, graduating student survey and alumni survey.

- Student satisfaction with the program will be surveyed every semester.
- Students will be tracked in terms of the successfulness in obtaining (or enhancing) employment.

Program evaluation is an important aspect of USCB's ability to communicate to various constituencies that its academic programs are strong, relevant to the mission, continuously improving, and performing at a level worthy of institutional, state and regional support. To accomplish this, USCB implemented an Institutional Effectiveness & Strategic Planning Framework (IESPF) that includes a series of activities and a timeline to ensure a continuous planning process and a feedback loop in regard to the desired outcomes of its educational programs and its academic and educational support services. Part of this framework is the annual Institutional Effectiveness and Outcomes Assessment (IE-OA) process where program objectives and student learning outcomes are assessed and results are used for program improvement. The IE-OA Plans articulate the programs purpose, goals, student learning outcomes, program objectives and action plans with budget implications for the coming year. The IE-OA Close Reports are due at the end of each academic year and include findings based on assessment activities The reports are reviewed by the Institutional Effectiveness Council and a final report is sent to the Chancellor, Cabinet, and Budget Committee for review.

Students evaluate the course and course instructor both qualitatively and quantitatively each semester. Faculty and their Department Chair use the data to assess the strengths and weaknesses of the course both in terms of course content and teaching approach. The department Chairs is required to evaluate faculty in the classroom. After the in-class evaluation, the Department Chair meets with the instructor to offer feedback and discuss continuous improvement strategies.

Beginning with the first class of graduates from the program, the Department, in collaboration with the Director of Career Services will develop, administer, and evaluate surveys to gauge graduate employment rates, student satisfaction, and employer satisfaction. The Department will survey field placement sites where CSci majors intern. Lastly, an external advisory board will be developed to provide guidance in program development and improvement, to identify ways to enhance USCB's service to private and non-profit sectors and impart a competitive advantage to the state of SC. CSci faculty will routinely review feedback from the above

assessments and surveys, and revise policies, curriculum, and recruitment efforts accordingly.

NEW PROGRAM PROPOSAL

Student Learning Assessment

Expected Student Learning Outcomes	Methods of/Criteria for Assessment
Proficiency with the knowledge in algorithms, programming languages, and computational methods	Completion of relevant courses (selected from CSCI 540, 580, 515,526, 550) with a grade of C or above
Proficiency with the knowledge in at least one computational science field	Completion of relevant courses with a grade of C or above
Ability to apply reasoning, problem solving, and technical skills to solve a problem with minimal guidance	Thesis research, project, or industrial/research internship
Ability to communicate technical concepts and results to audiences in the form of a technical report and/or an oral presentation to a review committee	Thesis research, project, or industrial/research internship

Will the proposed program seek program-specific accreditation?

☐Yes

☒**No**

If yes, provide the institution's plans to seek accreditation, including the expected timeline for accreditation. (500 characters)

Will the proposed program lead to licensure or certification?

☐Yes

☒**No**

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

NEW PROGRAM PROPOSAL

Teacher or School Professional Preparation Programs

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

☐Yes

☒**No**

If yes, complete the following components.

Area of Certification

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