NEW PROGRAM PROPOSAL FORM

Name of Institution: **Clemson University**

Name of Program (include degree designation and all concentrations, options, or tracks):
PhD Construction Science and Management

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.)

Consider the program for supplemental Palmetto Fellows and LIFE Scholarship awards?

☐ Yes
☒ No

Proposed Date of Implementation: **August 2023**

CIP Code: **15.1001**

Delivery Site(s): **Clemson University (Main Campus) (50104)**

Delivery Mode:

☒ Traditional/face-to-face   ☐ Distance Education
*select if less than 25% online   ☐ 100% online

                                                              ☐ Blended/hybrid (50% or more online)

                                                              ☐ Blended/hybrid (25-49% online)

                                                              ☐ Other distance education (explain if selected)

Program Contact Information (name, title, telephone number, and email address):

- **Mike Jackson, Ph.D., P.E.; Department Chair and Professor, Nieri Department of Construction, Development and Planning; 904.307.0845; nmjacks@clemson.edu**

- **Jeremy King, Associate Provost for Institutional Effectiveness; jking2@clemson.edu ; 864.934.3554**

Institutional Approvals and Dates of Approval (include department through Provost/Chief Academic Officer, President, and Board of Trustees approval):
Graduate Curriculum Committee: 13 December 2021
Provost: 14 December 2021
Board of Trustees: 2 February 2022

Background Information

State the nature and purpose of the proposed program, including target audience, centrality to institutional mission, and relation to the strategic plan.

South Carolina currently does not offer a PhD program in Construction Science and Management (CSM). The research-based 60-credit hour PhD degree program proposed here will prepare students for scholarly research to advance the body of knowledge in CSM and for knowledge- and scholarship-based careers in academia, construction industry, and government.

The PhD CSM program will contribute to Clemson's mission, R1 ranking and research goal, and advance the our strategic priorities of the University's ClemsonFORWARD strategic plan in the following ways:

Research: The CSM PhD program is strongly aligned with the pursuance of Clemson academic's aim to solve real world problems locally, nationally, and globally. PhD program students and faculty will apply scientific methodology to the latest construction industry challenges to advance the body of construction science and management knowledge.

Engagement: The PhD CSM program will provide students and faculty with the platform to engage with the construction industry to enhance the built environment and to strengthen partnerships while increasing Clemson's national and international visibility and reputation.

Academic Core: The aim of the PhD CSM program is to fuel growth and achievement in scholarly research and graduate education to rise to national and international prominence.

Living Environment: The PhD CSM program will aim to create an environment of inclusiveness through student and faculty recruitment to enhance diversity and improve workplace quality of life.

The target audience will be from three main student populations. The first target will be students enrolled in a bachelor's program wishing to pursue a graduate degree. The second target will be students in a master's program wishing to pursue a PhD degree. The third target will be industry practitioners wishing to either pursue a career in academia and/or develop an expertise/crendentials to pursue a career in the construction industry and government.

Assessment of Need

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

South Carolina currently does not offer a PhD program in Construction Science and Management (CSM). The CSM PhD program will graduate students with a terminal degree, the highest degree that can be achieved in the field of construction science and management. There are no PhD programs in the US in CSM. Currently there are 5 MCSM students and 4 PDBE students that will pursue the PhD in CSM once approved. There are two CSM Industry Advisory Board (IAB) members that would like to pursue the PhD in CSM. Once the PhD in CSM program is approved and can be marketed, the numbers will increase significantly.

Transfer and Articulation

Identify any special articulation agreements for the proposed program. Provide the articulation agreement or Memorandum of Agreement/Understanding.
N/A

Employment Opportunities

Occupation	State		National		Data Type and Source
	Expected Number of Jobs	Employment Projection	Expected Number of Jobs	Employment Projection	
Faculty/ Teaching	2 per year	10%	5800	13%	https://www.bls.gov/ooh/education-training-and-library/postsecondary-teachers.htm#tab-6
Construction Industry	825 per year	8% in 10 yrs.	300,000	8%	https://www.indeed.com/q-Construction-Manager-l-South-Carolina-jobs.html?vjk=2a84f816215f1ea5

Supporting Evidence of Anticipated Employment Opportunities
Provide supporting evidence of anticipated employment opportunities for graduates.

Large-scale secular economic factors are positive for employment within and across the diverse construction industry. Construction is a dominant growth industry in the US and abroad—driven by both population growth in select regions/countries and by organic per capita economic growth that results in concomitant demand for new roads, transportation systems, buildings (particularly those associated with healthcare, education, and other forms of social infrastructure), and other structures/systems.   BLS statistics project near 10% growth in domestic construction occupations from 2018 to 2028. Seasonally adjusted construction spending in the US topped $1.3 *trillion* in the US in 2018 according to the Associated General Contractors of America. Price Waterhouse Cooper forecasts construction output volume growing 85% by 2030 to $15.5 trillion worldwide.   This 3.9% annual growth rate exceeds estimates of global GDP growth by a full percentage point as emerging economies, and their growing populations, industrialize and develop.

Currently, there are 75 construction management bachelor's degree programs accredited by the American Council for Construction Education (ACCE), each with an ongoing need for appropriate PhD-credentialed faculty to teach in their programs. With tyical faculty sizes of 10 and typical turnover rates of 5-10% per annum, this represents an annual need of 38-75 PhD faculty to fulfill needs in the postsecondary market alone.   The most closely related program in Clemson's current doctoral portfolio is the PhD in Planning, Design, and the Built Environment (PDBE). In the most recent cohort of this programs five PhD graduates, four went into private industry to work and one went into academia to teach as a tenure-track Assistant Professor at LSU. Of the four that went into private industry, three started their own consulting firms and one works as a project manager for a national construction firm. These actual graduate trajectories are consistent with our experience of the professional orientation of the program's students, who are less interested in pursuing academic careers.   One of the goals of the PhD Construction Science and Management program is to attract a population of students who can both meet workforce needs in the postsecondary sector and follow the successful private-sector trajectories of the PhD PDBE program graduates.

Description of the Program

The proposed PhD CSM program requires a minimum of 60 credit hours beyond the bachelor's degree or 30 credit hours beyond the master's degree, including 18 credit hours of dissertation research, and a dissertation acceptable to the advisory committee and the Graduate School. There will be overlap of CSM PhD coursework with extant CSM graduate course offerings utilized, e.g., for the Master of Construction Science and Management degree program. CSM 8520-Construction Management Research covers qualitative, quantitative, and mixed research methods that prepare students for dissertation and other scholarly activities. The proposed PhD program requires students to take four

additional graduate courses beyond the master's degree. In consultation with their research advisor and Graduate Advisory Committee, this allows the student to take additional courses on research methods that best fit their individual needs and interests.

Additional requirements include a comprehensive examination and a dissertation defense. The PhD comprehensive examination will be administered after all coursework has been completed and the dissertation proposal is ready for approval by the student's graduate committee. The examination will consist of two parts: (1) a written and/or oral examination by the advisory committee on the student's preparation to complete the proposed research and (2) presentation of the proposed research. The written and/or oral examination may include consideration of graduate coursework, preliminary research and/ or other demonstration of the ability to conduct the proposed research. After passing this examination, the student is officially admitted to candidacy for the PhD degree. The candidate for the Doctor of Philosophy degree must pass a final oral examination (dissertation defense). The examination will consist of a presentation of the student's doctoral research and an assessment by the committee of the research approach, the significance of the findings and the contribution to the advancement of the construction science and management profession.

Projected Enrollment- Detailed Model											
Year	Fall Headcount				Spring Headcount				Summer Headcount			
	New	Continuing	Lost	Graduate	New	Continuing	Lost	Graduate	New	Continuing	Lost	Graduate
2023/24	9	0	0	0	2	9	0	2	0	9	0	1
2024/25	2	8	1	1	1	8	0	1	0	8	0	0
2025/26	2	8	0	1	2	9	0	1	0	10	0	2
2026/27	2	8	0	0	2	10	1	2	0	9	0	0
2027/28	3	9	0	0	2	12	0	2	0	12	0	2

Projected Enrollment			
Year	Fall Headcount	Spring Headcount	Summer Headcount
2023/24	9	11	9
2024/25	10	9	8
2025/26	10	11	10
2026/27	10	12	9
2027/28	12	14	12

Explain how the enrollment projections were calculated.
There are 8 students currently enrolled in the PhD in PDBE at Clemson who are anticipated to change their major to the PhD in CSM. This will result in an initial enrollment bolus that will persist for a handful of years. Since they are each at different parts of the program, they will graduate as they complete the requirements.

Over the past several years, students in the PDBE program supported by CSM faculty have expressed the desire for a PhD in CSM. As such, there is an active group of students to serve as the source of these projections. This is evidenced by 8-10 students currently enrolled in the PDBE program who anticipate

changing their major once the program is approved. It is anticipated this will translate into approximately 2-5 new students enrolling in the new program over the course of the year.

In each of the past 5 fall semesters (fall 2018-fall 2022), enrollment in the PhD PDBE program has ranged from 25-30 students. The loss of 8-10 students that may prefer to be in the proposed PhD Construction Science and Management program will not affect the former's compliance with CHE program productivity standards—enrollment would remain in the 15-22 student range, and completions would proceed at a rate of 3-5 per year based on historical time to graduation data.

It should also be stressed that the two PhD programs are not zero sum in terms of enrollment. This year, in anticipation of a possible approval of the PhD CSM program, we have increased marketing, outreach, and acceptances of students into the Master of CSM program. This has simultaneously allowed the PDBE program to accept more students; indeed, Fall 2023 applications for the PhD PDBE program have reached a healthy level of 64 at the current time. Additionally, based on discussions with our Master of CSM students, we are certain that we have 5 enrollees that will continue on in the proposed PhD CSM program. We also continue to receive an average of 5-10 inquiries per month from prospective students who inquire about doctoral opportunities in CSM. In sum, while the proposed PhD CSM program enrollment will have an initial modest enrollment from students transferring from the PhD PDBE program, the PhD CSM enrollment will not be built on the back of the PhD PDBE program, but will be self-sufficient.

The proposed CSM PhD program will have no effect on faculty teaching loads; the current teaching loads for tenured and tenure-track faculty will be maintained. As the number of students in our increasingly popular undergraduate program increases, additional faculty/lecturers are being hired; these faculty also contribute to our Master's (and proposed PhD) program. The CSM undergraduate program coordinator will continue to advise all undergraduate CSM students while the director of CSM graduate programs will continue to serve as the academic advisor for master's degree students in concert with tenured and tenure-track faculty who also advise their own thesis master's degree and PhD students.. Since the proposed CSM PhD students will be taking some of the same CSM graduate courses as the master's degree students, we foresee no impact on classroom scheduling as the University maintains (and strategically adds to) ample classroom capacity.

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

☐Yes
☒No

Curriculum

There will be overlap of PhD CSM coursework with the current CSM graduate course offerings utilized in the Master of Construction Science and Management program. A primary difference is that the PhD students will have to take doctoral dissertation research coursework and directed studies courses. Two new courses will be added to the current CSM graduate course offerings: CSM 9900-Directed Studies and CSM 9910-Doctoral Dissertation Research.

Existing CSM Graduate Courses:
- CSM 6300 - Residential Construction Management
- CSM 6310 - Residential Construction Practices
- CSM 6400 - Principles of Roofing from Design to Installation and Beyond
- CSM 6410 - Principles of Roofing II
- CSM 6420 - Roofing Business
- CSM 6550 - Reducing Adversarial Relations in Construction
- CSM (ARCH) 8330 - Fundamentals of Integrated Project Delivery Systems

- [CSM (ARCH) 8340 - Team Building, Communication and Collaboration for Integrated Project Delivery Systems](#)
- [CSM (ARCH) 8350 - Integrated Project Delivery Case Studies](#)
- [CSM (ARCH) 8360 - Managing Integrated Project Delivery](#)
- [CSM 8520 - Construction Management Research](#)
- [CSM 8600 - Construction Financial Planning and Analysis](#)
- [CSM 8610 - Construction Control Through CII Best Practices](#)
- [CSM 8620 - Personnel Management and Negotiations](#)
- [CSM 8630 - Advanced Planning and Scheduling](#)
- [CSM 8640 - Construction Business Strategy and Marketing](#)
- [CSM 8650 - Project Management](#)
- [CSM 8660 - Contractor Role in Development](#)
- [CSM 8670 - Green Building Delivery](#)
- [CSM 8680 - Emerging Technologies in the Built Environment](#)
- [CSM 8690 - Advanced Drone Mapping and Modeling](#)
- [CSM 8810 - Professional Seminar](#)
- [CSM 8890 - Special Problems](#)
- [CSM 8900 - Directed Studies](#)
- [CSM 8910 - Master's Thesis Research](#)
- [CSM 9900 - Directed Study](#)
- [CSM 9910 - Doctoral Dissertation Research](#)

New Courses
List and provide course descriptions for new courses.

CSM 9900 – Directed Study
Comprehensive studies and research of special topics not covered in other courses. May be repeated for a maximum of 12 credits

CSM 9910 – Doctoral Dissertation Research
Doctoral dissertation research. May be repeated for a maximum of 60 credits. To be taken Pass/No Pass only.

Total Credit Hours Required: 60

Curriculum by Year					
Course Name	**Credit Hours**	**Course Name**	**Credit Hours**	**Course Name**	**Credit Hours**
Year 1					
Fall		**Spring**		**Summer**	
CSM 8520 Constr Mgt Research	3	CSM 8650 Project Mgt	3	Research	0
CSM 8610 Constr Control	3	CSM 8680 Emerging Technologies	3	Publications	0
CSM Elective Course	3	CSM Elective Course	3	Internship	0
Total Semester Hours	**9**	Total Semester Hours	**9**	Total Semester Hours	**0**
Year 2					
Fall		**Spring**		**Summer**	
CSM 8900 Directed Studies	3	CSM 8900 Directed Studies	3	Research	0
CSM 8910 Master's Thesis Research	3	CSM 8910 Master's Thesis Research	3	Publications	0
CSM 8000 level Elective Course and/or Advisor approved 8000/9000 level Graduate Course outside CSM	3	CSM 8000 level Elective Course and/or Advisor approved 8000/9000 level Graduate Course outside CSM	3	Internship/Teaching	0
Total Semester Hours	**9**	Total Semester Hours	**9**	Total Semester Hours	**0**

CSM Elective Courses: CSM 6300, CSM 6310, CSM 6400, CSM 6410, CSM 6420, CSM 6550, CSM 8330, CSM 8340, CSM 8350, CSM 8360, CSM 8600, CSM 8620, CSM 8630, CSM 8640, CSM 8660, CSM 8670, CSM 8690, and CSM 8810.

Advisor approved 8000/9000 level Graduate Courses outside CSM: including but not limited to STAT 8010, STAT 8020, STAT 8050, PRTM 8130, PDBE 8080, PDBE 8150, PDBE 8160, PDBE 8200, EF 8190, MATH 8050, ME 8190, CRP 8010-8080, 8120-8150, 8170, 8200, 8220, 8340, 8350, 8400, 8420, 8440, 8450, 8580, 8720, and 8730, and RED 8000-8030, 8090, 8100-8130, 8150, and 8160.

Course Name	Credit Hours	Course Name	Credit Hours	Course Name	Credit Hours
Year 3					
Fall		Spring		Summer	
CSM 9900 Directed Study	3	CSM 9900 Directed Study	3	Research	0
CSM 9910 Doctoral Dissertation Res	6	CSM 9910 Doctoral Dissertation Res	6	Publications	0
				Internship/Teaching	0
Total Semester Hours	**9**	Total Semester Hours	**9**	Total Semester Hours	**0**
Year 4					
Fall		Spring		Summer	
CSM 9910	6				
Total Semester Hours	**6**	Total Semester Hours		Total Semester Hours	
Year 5					
Fall		Spring		Summer	
Total Semester Hours		Total Semester Hours		Total Semester Hours	

Similar Programs in South Carolina offered by Public and Independent Institutions

Identify the similar programs offered and describe the similarities and differences for each program.

Program Name and Designation	Total Credit Hours	Institution	Similarities	Differences

There are no similar PhD Programs currently offered in SC

Faculty

Rank and Full- or Part-time	Courses Taught for the Program	Academic Degrees and Coursework Relevant to Courses Taught, Including Institution and Major	Other Qualifications and Relevant Professional Experience (e.g., licensures, certifications, years in industry, etc.)
Professor #1, Full-time	CSM 8660, CSM 8900, CSM 8910, CSM 9900 & CSM 9910	Ph.D. Construction Management – Heriot Watt University	26 years on CSM faculty at Clemson
Professor #2, Full-time	CSM 8330, CSM 8350, CSM 8360, CSM 8900, CSM 8610, CSM 9900, & CSM 9910	Ph.D. Civil Engineering – University of Tennessee	24 years on CSM faculty at Clemson
Associate Professor #1, Full-time	CSM 6300, CSM 6310, CSM 8680, CSM 8900, CSM8910, CSM 9900, & CSM 9910	Ph.D. Architecture – Virginia Tech	10 years on CSM faculty at Clemson
Associate Professor #2, Full-time	CSM 8670, CSM 8690, CSM 8900, CSM 8910, CSM 9900, & CSM 9910	Ph.D. Building Construction – University of Florida	9 years on CSM faculty at Clemson
Associate Professor #3, Full-time	CSM 8520, CSM 8900, CSM 8910, CSM 9900, & CSM 9910	Ph.D. Construction Engineering and Management – University of Nebraska	6 years on CSM faculty at Clemson, 7 plus years of international construction industry experience.
Assistant Professor #1, Full-time	CSM 6400, CSM 6410, CSM 6420, CSM 8650, CSM 8900, CSM 8610, CSM 9900, & CSM 9910	Ph.D. Construction Management – Arizona State University	4 years on CSM faculty at Clemson, 5 plus years of construction industry experience.
Assistant Professor #2, Full-time	CSM 8600, CSM 8610, CSM 8900, CSM 8610, CSM 9900, & CSM 9910	Ph.D. Civil Engineering – University of Texas	3 years on CSM faculty at Clemson, 5 plus years of construction industry experience.
Professor #3, Full-time	CSM 8900, CSM 8610, CSM 9900, & CSM 9910	Ph.D. Civil Engineering – Oregon State University	5 years as Department Chair at Clemson & over 30 years of higher education experience.

Total FTE (full-time equivalent) needed to support the proposed program
Faculty: 7.5
Staff: 2
Administration: 1

Faculty, Staff, and Administrative Personnel
Discuss the Faculty, Staff, and Administrative Personnel needs of the program.

No new Faculty or Staff will be required to support the program; current faculty and staff are already fully engaged in the delivery of the required non-dissertation courses.

<center>**Resources**</center>

Library and Learning Resources
Explain how current library/learning collections, databases, resources, and services specific to the discipline, including those provided by PASCAL, can support the proposed program. Identify additional library resources needed.

The Clemson University Libraries' resources required for the proposed program are already in place and available online; therefore, there is no need for additional library resources. All major journals in the discipline are available online or through open access. The Clemson University Libraries hold more than 1.8 million items including books, periodicals, electronic resources, digital media collections, government publications and patents, musical recordings, maps and microforms. Over 4,000 print journal titles, 49,000 e-journals, 170,000 e-books, and 480 online databases are available. Cooper Library is linked electronically to the On-line Computer Library Center Inc. and WorldCat database providing access to more 71,000 libraries worldwide for interlibrary loan services. The PASCAL and Kudzu Consortium(s) provide access to 12 million volumes held by academic libraries in SC and 30 million volumes by 17 southeastern universities.

Students request journal articles through interlibrary loan and are emailed in 2-3 days. Reference librarians assist students by telephone, text, instant message and in-person consultation 79 hours per week; the College of Architecture, Arts and Humanities and the field of construction science and management already have dedicated research librarians. In addition to annual expenditures, current Library policy allocates additional funds for the exclusive purchase of materials for newly approved programs, if needed. No new funding is required to support the library and learning resources.

My Library Account: Students enrolled in off-campus, distance education, and online programs can log in to their My Library Account to search the Clemson Libraries catalog and request the delivery of print books. In addition to print books, Clemson affiliates have access to 458,239 electronic books via individual subscriptions, aggregator databases, and consortial agreements.

Books and Articles not owned by Clemson University Libraries: Students may use the PASCAL Delivers service to borrow books from any college or university in South Carolina. Requests are made through the Clemson University Libraries home page and delivered to a participating library. Students can borrow up to 25 books for six weeks, with an additional three-week renewal period.

If a book is not owned by the Clemson University Library and is not available via PASCAL Delivers, students may directly request the item from the Reference Librarian. Approved books will be rush ordered/cataloged and sent to the requesting patron, who will be responsible for returning them to Cooper Library (via either mail or return to a PASCAL Delivers library.)

Articles owned by Clemson University Libraries: Students requiring articles from print journals owned by the Library may request a scanned copy via http://www.clemson.edu/culib/forms/secure/ill/emp/dd-rp.php. Articles not available from Clemson University Libraries: Students also have free access to interlibrary loan to request copies of articles from journals not available at Clemson. Students must create an account prior to borrowing via the following website: http://libguides.clemson.edu/ill.

Reference Assistance: Students encountering difficulties finding resource materials may contact the Reference Librarian, who will respond to requests often immediately or within 24 hours. Students also have access to the Ask a Librarian service to request immediate assistance via phone/chat /text/ or email during normal Reference Desk hours.

Student Support Services
Explain how current academic support services will support the proposed program. Identify new services needed and provide any estimated costs associated with these services.

In addition to library and learning resources, a number of academic and student support services are available to all graduate students—including online students—at Clemson University:

- **Clemson Computing and Information Technology (CCIT) –** Provides a leading-edge integrated information environment integral to learning and research. Graduate students may (but are not limited to) take advantage of services such as Clemson email account, emergency text messages, mobile guidebooks, video conferencing, web development, and data storage. Help services are available via phone, email, or online chat.
- **Student Accessibility Services** – Graduate Students may register with Student Accessibility Services to use services such as academic access letters, assistive technology, communication services, test proctoring center and electronic textbooks.
- **Center for Career and Professional Development** – Clemson University is dedicated to engaging students in career development that will empower them to successfully pursue their educational and professional goals. Services provided by the career center include career workshops, resume writing, career development, job search assistance, and networking.
- **GRAD 360°** – A professional development program affiliated with The Graduate Scholl that provides students with a structured way to develop and track their proficiency in the academic, personal, and professional focus areas known as "The Tiger 9": career development; personal health, wellness and financial literacy; research and innovation; professionalism and ethics; leadership and management; teamwork and collaboration; teaching and learning; oral, written and intercultural communication; and social and global responsibility. Each student's development program can be tailored to meet their unique needs and interests. Students can identify their skills, interests, and values throughout their Clemson experience; engage their advisors in holistic advising and mentoring; acquire and develop specific skills necessary for postgraduate professional practice; and track their transformation by recording their experience in an online portfolio.
- **International Services** – The Office of Global Engagement's International Services area works with incoming international students to provide valuable information, service and advice to meet their unique needs. International Services is a valuable resource for international students' immigration, employment, and support needs, and works to create a welcoming, positive environment for Clemson's international student population to help them meet their academic and research goals while making sure their personal goals are taken into consideration.
- **Counseling and Psychological Services (CAPS)** – Counseling and Psychological Services (CAPS), the mental health department of Student Health Services, offers a wide array of services along a continuum of intensity for various psychological issues.
- **Graduate Student Life** – Operating under the Division of Student Affairs, this is a central body that collaborates with the Graduate School and Graduate Student Government to enhance the overall graduate student life experience.
- **Clemson University Writing Center** – The goal of the writing center is to help all members of the Clemson community become more confident and effective writers.
- **The Harvey and Lucinda Gantt Multicultural Center** – The Harvey and Lucinda Gantt Multicultural Center is committed to creating diverse learning environments that enhance the intercultural competence of our students. The center supports and advocates for the needs of all students, challenges students to think critically about themselves and their communities, provides engaging experiential learning opportunities and empowers students to be positive change agents.
- **Clemson Online** – Clemson Online staff are here to ensure that all online students have access to the same resources and support that a first-class Clemson education comprises for students enrolled in programs having in-person modalities. Clemson University is devoted to ensuring an innovative and substantive educational experience for all students.

There are no new services need to support the proposed program.

Physical Resources/Facilities

Identify the physical facilities needed to support the program and the institution's plan for meeting the requirements.

All physical facilities (e.g., offices, classrooms, computing/IT equipment) needed to support the program are already in existence and associated with the current degree programs in the Nieri Department of Construction, Development and Planning.

Equipment

Identify new instructional equipment needed for the proposed program.

All instructional equipment needed to support the program are already in existence and associated with the current degree programs in the Nieri Department of Construction, Development and Planning.

Impact on Existing Programs

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

☐Yes

☒No

We provide explanation and comments regarding potential impact on the PhD Planning, Design and Built Environment in the ***Explain how the enrollment projections were calculated*** section on pp 4-5.

Financial Support

Sources of Financing for the Program by Year												
	1st		2nd		3rd		4th		5th		Grand Total	
Category	New	Total	New	Total	New	Total	New	Total	New	Total	New	Total
Tuition Funding	$140,166	$140,166	$133,805	$133,805	$155,177	$155,177	$160,187	$160,187	$198,403	$198,403	$787,738	$787,738
Program-Specific Fees	$190,620	$190,620	$217,746	$217,746	$223,860	$223,860	$230,146	$230,146	$283,933	$283,933	$1,146,305	$1,146,305
Special State Appropriation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Reallocation of Existing Funds	$183,610	$183,610	$189,117	$189,117	$194,793	$194,793	$200,644	$200,644	$206,675	$206,675	$974,839	$974,839
Federal, Grant, or Other Funding	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$514,396	$514,396	$540,667	$540,667	$573,829	$573,829	$590,978	$590,978	$689,012	$689,012	$2,908,882	$2,908,882
Estimated Costs Associated with Implementing the Program by Year												
	1st		2nd		3rd		4th		5th		Grand Total	
Category	New	Total	New	Total	New	Total	New	Total	New	Total	New	Total
Program Administration and Faculty/Staff Salaries	$509,146	$509,146	$535,312	$535,312	$568,367	$568,367	$585,406	$585,406	$683,329	$683,329	$2,881,560	$2,881,560
Facilities, Equipment, Supplies, and Materials	$5,250	$5,250	$5,355	$5,355	$5,462	$5,462	$5,571	$5,571	$5,683	$5,683	$27,321	$27,321
Library Resources	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other (specify)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$514,396	$514,396	$540,667	$540,667	$573,829	$573,829	$590,978	$590,978	$689,012	$689,012	$2,908,882	$2,908,882
Net Total (Sources of Financing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Minus Estimated Costs)												

Note: New costs - costs incurred solely as a result of implementing this program. Total costs - new costs; program's share of costs of existing resources used to support the program; and any other costs redirected to the program.

Budget Justification

Provide an explanation for all costs and sources of financing identified in the Financial Support table. Include an analysis of cost-effectiveness and return on investment and address any impacts to tuition, other programs, services, facilities, and the institution overall.

The Ph.D. in Construction Science and Management will be funded and supported by reallocation of resources within the College of Architecture, Arts and Humanities, program specific fees, and by minimal tuition revenue. Tuition revenue was calculated using the doctoral tuition rate at $599 per credit hour; however, the majority of students will receive a tuition waiver and stipend for undergraduate teaching support. Reallocation of Existing Funds represents faculty workload and courses already taught within the College. Faculty workload is calculated $10K per course. No new faculty required. Program Specific Fees are not those associated with the PhD program enrollment, but are those allocated to the program from Department funds from undergraduate design fee revenue. Program Administration and Faculty and Staff Salary is supported by Reallocation of Existing Funds and Program Specific Fees for current faculty workload, courses taught within the College, and Graduate Teaching Assistants who will receive a stipend of $20K. Marketing and Advertising is budgeted at $5K per year, and an additional 5 percent is allocated for programmatic operating supplies. Non-salary expenses are estimated to grow 2 percent per year. Due to students receiving stipends in exchange for undergraduate teaching support, the program is expected to receive a net of $0. There are no additional impacts on tuition rates, services, or facilities.

Evaluation and Assessment

Program Objectives	Student Learning Outcomes Aligned to Program Objectives	Methods of Assessment
1. Prepare graduates to solve real world problems locally, nationally, and globally.	Apply critical thinking	Comprehensive Examination Dissertation Assignment/Projects in CSM 8610
	Apply problem solving techniques	Comprehensive Examination Dissertation Assignment/Projects in CSM 8680
	Apply advanced communication technology	Comprehensive Examination Dissertation Assignment/Projects in CSM 8680
2. Prepare graduates for Academic Employment	Apply research methods	Comprehensive Examination Dissertation Assignment/Projects in CSM 8520
3. Prepare graduates for Advanced Construction Industry Employment	Create professional written communication	Comprehensive Examination Dissertation Assignment/Projects in CSM 8520
	Apply decision making techniques	Comprehensive Examination Dissertation Assignment/Projects in CSM 8650
	Apply professional ethics	Comprehensive Examination Dissertation Assignment/Projects in CSM 8650
	Apply advance construction management practices	Comprehensive Examination Dissertation Assignment/Projects in CSM 8610
	Understand risk management	Comprehensive Examination Dissertation Assignment/Projects in CSM 8650
	Understand the principles of leadership in business	Comprehensive Examination Dissertation Assignment/Projects in CSM 8610

Explain how the proposed program, including all program objectives, will be evaluated, along with plans to track employment. Describe how assessment data will be used.

The program objectives are assessed annually through the Student Learning Outcomes (SLO's) based on student performance on course assignments/projects in specific CSM courses, comprehensive examinations, dissertation research and the results from student perception surveys (graduating student exit survey and course specific surveys). The assessment data collected is used for: continuous improvement of the degree program; to provide evidence that the degree program is making progress in achieving its mission, objectives, and learning outcomes; curriculum management and stewardship; and ensuring overall student development.

Post-graduation employment outcomes are tracked via the Graduating Student Exit Survey (program specific), as well as the University's First Destination Survey (deployed through the Clemson Career and Professional Development Center 6-12 months after graduation) and Alumni Surveys (deployed at regular intervals)

Accreditation and Licensure/Certification

Will the institution seek program-specific accreditation (e.g., CAEP, ABET, NASM, etc.)? If yes, describe the institution's plans to seek accreditation, including the expected timeline.

☐Yes
☒No

Will the proposed program lead to licensure or certification? If yes, identify the licensure or certification.

☐Yes
☒No

Explain how the program will prepare students for this licensure or certification.

We are adding two new certificate programs (e.g. a graduate certificate in Roofing Industry Management) that will be available to, and may appeal to, CSM PhD students. We also offer CSM 8690-Advanced Drone Mapping and Modeling in which students can earn a license.

If the program is an Educator Preparation Program, does the proposed certification area require national recognition from a Specialized Professional Association (SPA)? If yes, describe the institution's plans to seek national recognition, including the expected timeline.

☐Yes
☒No