

**Request for Authorization to Establish  
Bachelor of Science (BS) in Professional Studies  
CIP 24.0101  
Appalachian State University**

**I. Program Highlights**

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- Appalachian State University proposes the establishment of a Bachelor of Science in Professional Studies. The major is designed to provide degree-seeking students, especially post-traditional and part-way home students with the knowledge, critical thinking, and leadership skills needed to take on complex responsibilities in a wide range of professional fields. The program will be available on the Boone campus, online, and at the App State Hickory site.
- The proposed program aligns with App State University's mission and vision to support educational access and empower learners through innovative academic programs accompanied by experiences taking place beyond the classroom, cultivating scholarship, engagement and creativity. The knowledge and experience gained will shape students into globally minded, responsible members of society who engage with and actively contribute to their communities.
- This program is well designed for part-way home students, military students, and high credit hour transfer students. App State has more than 7,200 part-way home students. As employers seek a workforce of individuals who have a bachelor's degree, this program will provide a flexible pathway for individuals to obtain a that degree in the most convenient way possible for learners. We have identified 4,357 students who withdrew in the last five years after having earned at least 60 credit hours. If this program is approved, we would immediately engage with this group of partway home students.
- Graduates, whether looking to enter the workforce, to make a career change, or to continue advancing within current employment, will be able to meet their goals with the completion of this rigorous academic yet flexible program. Students will work with advisors to design pathways that are individualized and applicable. There is a required course early in the program which introduces students to course choices to allow them the opportunity to develop skills and competencies to meet their future and career goals. The required capstone course will provide students a chance to exhibit these skills and competencies through an internship or other significant project.

**II. Academic Program Planning Criteria (UNC Policy 400.1)**

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1. **Relation to Campus Distinctiveness and Mission.** While the Professional Studies program will provide a clear path to graduation for traditional student populations, part-way home and those who have withdrawn from the institution, Appalachian will also look to expand the pipelines to post-traditional and adult learners in surrounding rural counties. Since this program builds upon courses already offered at Appalachian, this degree program will help former students with prior academic credit to reduce their cumulative student debt by maximizing the applicability of previously earned credits to a high-quality, post-secondary bachelor's degree.
2. **Student Demand.** The UNC System strategic plan includes a goal to increase access and grow student enrollment in Tier 1 and Tier 2 counties. Per *My FUTURENC*, there are over 7,000 adult students enrolled in North Carolina Community College curriculum programming in eight Tier 1 and Tier 2 counties surrounding Watauga in fall 2021. This flexible, online degree program will provide greater access to a degree completion program for students in Western North Carolina,

who currently have limited access to this type of degree program, given there are no public baccalaureate degree completion programs in the western region of the state. Giving students the viable option of an accessible, attainable degree will assist the UNC System in meeting the rural enrollments goal, as well as supporting the goal of learner persistence to help meet the State's economic needs of educating 2 million North Carolinians not yet holding a postsecondary degree.

Additionally, of the 791 students over the age of 25 who completed a degree at Appalachian State within the past 6 years after transferring in 60 plus hours (a target group for this degree program), the average number of credit hours earned by graduation is 140; 25% of this group earned over 152 credit hours by the time they graduated. This is significantly over the 120 credit hours required for a degree at Appalachian. It is our goal that the increased flexibility of this degree program will allow a significant number of these students to complete their degrees more efficiently.

3. **Employment Opportunities for Graduates.** Given the flexibility of the program, there is an array of opportunities that awaits students once they successfully complete their individualized program. In January and February of this year, there were a total of 237,461 unique job postings in North Carolina of which at least 26% noted a bachelor's degree requirement for the position. (LightCast). While graduates of this program would not be eligible for all of these positions, perhaps graduates can use the flexibility of this program to be eligible for many more career paths than they would be without the bachelor of science degree. Additionally, within a two-year timeframe (2020-2022) there were more than 151,000 individuals within North Carolina who reported attaining an associate's degree as their highest level of education, (Lightcast). Over the last two years there were almost 250,000 job postings in North Carolina, which required a bachelor's degree, (Lightcast).
4. **Impact on Access and Affordability.** The multiple modalities through which this program is offered provides students the opportunity to finish their degree in such a way that is convenient for them. Recognizing that this population is unique in terms of college credit completed, work experience, age, etc. Appalachian will provide ample support to these students starting at the prospect stage, and continuing as students move toward fulfilling their ultimate goal of attaining an undergraduate degree. Examining the costs associated with the Professional Studies degree programs and student debt is complicated as the comparisons are reflective of a traditional four-year program—many students will be able to complete this degree program in two years or less. Complexities aside, Appalachian can deliver an affordable Professional Studies bachelor's degree to students without students accruing a massive amount of debt. In 2023, Lightcast projected median earnings of a bachelor's degree within this field to be \$49,000 within North Carolina and \$52,000 nationally. After four years, the average debt of graduates earning a degree from North Carolina public/private institutions is between \$29,750 and \$21,720 with a median monthly loan payment of \$268 (U.S. Department of Education Scorecard); the average national debt of graduates is \$27,870 (Texas Public Policy Foundation, College Earnings and Debt by Major).

App State is not requesting any program-specific fees or tuition differential for this program. Tuition and fees for the 2023-2024 full-time (12+ credit hour) rates are as follows:

Full-Time 2023-2024 Undergraduate Tuition and Fees per Year (In Dollars)

Category	Resident	Non-Resident
Tuition	4,242.00	21,238.00
Tuition Differential	--	--
Mandatory Fees (Athletics, Student Activities, Health Services, Educational & Technology, Campus Security, Debt Service, ASG)	3,839.00 Online - 1,156.96	3,839.00 Online - 1,156.96
Special Fees	--	--

5. **Expected Quality.** A total of 120 hours is required for this program. This includes completion of 44 semester credit hours of general education, free elective hours, and degree-major hours—including 9 hours of required courses and the two areas of focus (each is a minor or certificate). Students will also meet all university residency requirements which means having at least 24 semester credit hours at the 3000 level or higher. Part of the purpose of the introductory course in this major is to help students think about the desired outcomes of their college experience, career-focused or other. Students will then discuss with an advisor how to choose degree focus areas to achieve these outcomes. The capstone course of the program is designed to give students hands-on experience in their area either through an internship or other significant project.
6. **Faculty Quality and Number.** If the program is approved, a program director will be hired whose duties will include teaching the introductory and senior capstone course for 2 sections, as well as working with advisors for oversight of students enrolled in this program. Initially, there will not be new faculty hired for this program, as the teaching responsibilities will be absorbed by current faculty members. This program will use existing course content provided by our faculty who teach general education and other relevant degree areas.
7. **Relevant Lower-level and Cognate Programs.** The flexibility and student choice present in the Professional Studies program allows students to build upon any expertise or specializations offered at Appalachian in any combination they desired outcomes.
8. **Availability of Campus Resources (library, space, etc.)** Whether students are taking online or in-person courses, Appalachian is equipped with sufficient infrastructures related to library resources, physical space, instructional technology, student support resources, etc. No new space will be needed at this time.
9. **Existing Programs (Number, Location, Mode of Delivery).** There are similar degrees at: East Carolina, University Studies - 24.0101, On-campus and Online; Fayetteville State University, Interdisciplinary Studies - 24.0101, On-campus and Online; UNC Charlotte, Professional Studies, online; UNC Greensboro, Liberal and Interdisciplinary Studies - 24.0101, On-campus and Online
10. **Potential for Unnecessary Duplication.** The proposed Professional Studies program differs from the above mentioned UNC System programs in the required number of general education credit requirements, and significant degree-major requirements which includes the completion of two focus areas, (a minor or certification with at least 12 hours each). The program will serve former App State students who left the university in good standing as well as military students because

both populations have significant prior learning credits which will be readily applied to the degree requirements. Additionally, non-traditional and stop-out students often want to return to college at an institution close to where they live. The other UNC System institutions with similar degree programs are in the piedmont and eastern part of the state. The program gives students in the western part of the state an option nearby through which to complete their degrees.

- 11. Feasibility of Collaborative Program.** While collaborating with other UNC System institutions isn't explicitly laid out in this proposal, the opportunity does exist. App State currently serves almost 5,000 transfer students, many of whom bring credit into Appalachian from other UNC System institutions. This program will ensure that students transferring in will maximize applicability of transfer credits towards a degree at Appalachian, while obtaining their degree in a minimal number of hours (120 SCH). Additionally, students will be permitted to take visiting coursework at other UNC System or North Carolina Community College institutions to supplement Appalachian's offerings, provided they have sufficient credits in-residence per institutional and System policies.

### **III. Summary of Review Processes**

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- 1. Campus Review Process and Feedback.** The academic proposal was reviewed and approved by The Academic Policy and Procedure Committee; Dr. Ted Zerucha - Assistant Vice Provost, General and Experiential Education; Dr. Mike McKenzie - Vice Provost of Academic Program Development and Strategic Initiatives; Dr. Dan Layzell - Vice Chancellor of Finance and Operations; Dr. Heather Hulburt Norris - Provost and Executive Vice Chancellor; and Dr. Sheri Everts – Chancellor.

**UNC System Office Review Process and Feedback.** Throughout the review process, Appalachian State University provided relevant information pertaining to program requirements and resources. The institution submitted appropriate documentation and research to support the statements made.

### **IV. Recommendation**

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Staff recommends that the Board of Governors approve Appalachian State University's request to establish the Bachelor of Science in Professional Studies (CIP 24.0101), effective fall 2023.

**Request for Authorization to Establish  
Bachelor of Science (BS) in Materials Science and Manufacturing  
CIP 40.1001  
Fayetteville State University**

**I. Program Highlights**

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- Fayetteville State University proposes the establishment of a Bachelor of Science (BS) in Materials Science and Manufacturing.
- The purpose of the proposed degree program is to strengthen FSU's portfolio of innovative STEM degree programs consistent with the institution's mission statement. The program would support North Carolina's manufacturing industry, which produces 20 percent of the state's GDP and provides employment in rural counties at rates beyond the state and national average (according to the North Carolina Rural Economic Development Center). The proposed degree program would attract more students, including military-affiliated students, to the area and develop a STEM workforce for the state, nation, and U.S. Army.
- The proposed degree program would support the FSU Mission Statement by offering a "robust and innovative degree" program. The program would promote the goals of the FSU Vision Statement to become "the regional university of choice for students from rural, military, and other diverse backgrounds who are poised to become visionary leaders who transform communities, states, and nations."
- The proposed degree program in materials science and manufacturing would support the state economy by producing a skilled workforce in a STEM field. North Carolina is among the top 10 manufacturing states in the United States. Production industries are among the pillars of North Carolina's economy. Companies purchase significant inputs from many other sectors, including research and development, professional services, agriculture, travel, construction, and trucking. In North Carolina's 85 rural counties, employment in manufacturing is higher than the state or national average. In 18 rural counties, manufacturing accounts for more than 20 percent of local employment. However, there are no BS degrees in manufacturing offered in the state. The proposed degree program will directly support the manufacturing industry in the state.
- Fort Bragg, located near Fayetteville, NC, is the largest military installation in the U.S. by population. Approximately 30 percent of FSU students are military affiliated, including active-duty personnel and veterans. According to the Department of Defense (DoD), additive manufacturing is a powerful tool to enable innovation and modernization of defense systems, support readiness, and enhance innovation and capability. As DoD's demands in this field increase, the proposed degree program would attract more military affiliated students.
- Students who graduate from this program would be proficient in computational materials science and manufacturing methods in preparation for careers as science and technology professionals in production industry, government, military, and academia. They would apply their hands-on training to identify and solve real-world problems in materials and manufacturing systems, present solutions in oral, written, and graphic modes, conduct work or testing in materials science and manufacturing fields.

## II. Academic Program Planning Criteria (UNC Policy 400.1)

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- 1. Relation to Campus Distinctiveness and Mission.** The proposed degree program would provide a career option uniquely suited for the population served by FSU. Around 30 percent of FSU students are military affiliated and most of the students are from rural counties. In North Carolina, additive manufacturing provides 20 percent of the employment in 18 rural counties, a higher rate than the state average. The DoD published a strategy noting that additive manufacturing can enable innovation and support warfighter readiness. Given few other related bachelor's programs in the University of North Carolina System or at Historically Black Colleges and Universities nationwide, the proposed degree program may appeal to FSU's unique student population.

The proposed BS in Materials Science and Manufacturing degree program would be consistent with the FSU Mission Statement's position of offering a "robust and innovative degree" program. The proposed degree program's suitability for rural and military-affiliated students would support the FSU Vision Statement goal of becoming "the regional university of choice for students from rural, military, and other diverse backgrounds who are poised to become visionary leaders who transform communities, states, and nations."

- 2. Student Demand.** North Carolina is one of the top 10 manufacturing states in the United States. According to the North Carolina Rural Economic Development Center, manufacturing represents 20 percent of the state's GDP. In 18 rural counties, the employment in manufacturing exceeds the state average, accounting for more than 20 percent of local employment. Most students at FSU are from rural NC counties. However, the only bachelor's degree in Materials Science or Engineering is offered at NC State University. North Carolina students could benefit from an expansion of this career option.

The FSU Department of Chemistry, Physics, and Materials Science recognized a trend in student interest in materials science in recent years. Since December 2020, there have been seven graduates from the BS in Chemistry with a Concentration in Materials Science degree program. Since 2017, 10 students completed the Materials Science minor.

Nationally, the HBCUs that offer a bachelor's degree in manufacturing or materials science are Florida A&M University, Howard University, and Jackson State University. FSU may be able to attract prospective out-of-state materials science students considering attending an HBCU.

Fort Bragg, located near Fayetteville, is the largest military installation in the U.S. by population. Around 30 percent of FSU students are military affiliated, including active service persons and veterans. According to the "Department of Defense Additive Manufacturing Strategy" published in 2021 (<https://www.cto.mil/dod-additive-manufacturing-strategy/>), the value of additive manufacturing for innovation and modernization of defense systems has been recognized by DoD. The proposed degree program may attract military affiliated students.

- 3. Employment Opportunities for Graduates.** According to Burning Glass, a labor market analysis company, from 2016 to 2021, 391,058 jobs related to manufacturing were offered in North Carolina, mostly in Charlotte, the Research Triangle, and the Triad. More than 10,000 jobs related to manufacturing were offered in Fayetteville. Average salaries ranged from \$55,058 for managers, to \$79,551 for engineers and computer Occupations, and \$96,306 for sales managers. Burning Glass reported that employers were seeking skills in production, repair, project management, software

and information technology, etc. Most of the jobs were considered as low risk for replacement by automation. By far, the bachelor's degree was the credential most requested by employers.

FSU consulted with Dr. Yaroslava G. Yingling, NC State's Director of Undergraduate Programs, regarding their BS in Materials Science and Engineering degree program. Among their graduates from the BS degree program prior to the pandemic, 82 percent obtained jobs or were admitted to graduate schools at the time of graduation.

4. **Impact on Access and Affordability.** In fall 2021, Fayetteville State University became an NC Promise institution. NC Promise helps support FSU's enrollment and retention rate, while making the cost of tuition more affordable for in-state students. Fall 2023 tuition rates for student and commuter students are listed below. FSU is committed to its mission to meet the educational, career, and personal aspirations of its students from rural, military, and other diverse backgrounds. Providing a high-quality academic degree program that fulfills labor market needs at an affordable price can expand access for FSU students. Furthermore, the proposed program aligns with the UNC System-level goals of expanding access to affordable high-quality degrees by providing students from diverse background access to higher education and ensuring the UNC System education remains among the most affordable in the nation. FSU is not requesting any program-specific fees or tuition differential for this program. Tuition and fees for the ACADEMIC YEAR full-time (12+/9+ credit hour) rates are as follows:

Full-Time 2023-24 Undergraduate Tuition and Fees per Year (In Dollars)

Category	Resident	Non-Resident
Tuition	(NC Promise Tuition) 1,000.00	(NC Promise Tuition) 5,000.00
Tuition Differential	N/A	N/A
Mandatory Fees (Athletics, Student Activities, Health Services, Educational & Technology, Campus Security, Debt Service, ASG)	2,525	2,525
Special Fees	N/A	N/A

5. **Expected Quality.** The proposed degree program would consist of 120 credit hours: 39 credit hours of university core curriculum; 24 credit hours of correlative requirement courses (CSC 105: Introduction to Computer Science for Technical Majors, MATH 142: Calculus with Analytic Geometry I, MATH 241: Calculus with Analytic Geometry II, PHYS 125: College Physics I, etc.); 33 credit hours of materials science and manufacturing core requirements; 18 credit hours of general concentration courses; six credit hours of general concentration electives.

The proposed curriculum would offer a concentration in computation, including MATS 303: Data Visualization and Graphics, MATS 331: Numerical Methods in Material Processing, and MNFG 461: Machine Learning and Artificial Intelligence for Materials Science and Manufacturing. The proposed degree program would seek programmatic accreditation from the Accreditation Board for Engineering and Technology (ABET), a non-governmental organization that accredits post-secondary education programs in applied and natural science, computing, engineering, and engineering technology. The application for accreditation is allowed when at least one program graduate is

produced. Therefore, the Department of Chemistry, Physics, and Materials Science anticipates submission of the ABET accreditation application in the fifth year of the program.

- 6. Faculty Quality and Number.** Faculty members in the chemistry program are qualified to teach courses in the proposed degree program, holding terminal degrees in relevant subject areas. Two additional tenure-track positions would be sought to meet the needs of program majors. The first faculty member would be requested for the beginning of the proposed degree program. The second faculty member would be hired in the third year to support student needs.
- 7. Relevant Lower-level and Cognate Programs.** FSU has lower-level programs that can support the proposed degree program, including a minor in materials science and a minor in chemistry. This would be bolstered by MATS courses in the existing BS in Chemistry with a Concentration in Materials Science degree program. Other subject-matter fields at FSU would provide valuable support of the proposed degree program, including chemistry, mathematics, and statistics.
- 8. Availability of Campus Resources (library, space, etc.)** FSU has sufficient existing infrastructure, including research laboratories and equipment, to support the proposed degree program. The proposed degree program will not create an immediate need to modify or upgrade existing technology, information technology, or services. If additional resources are needed due to increased enrollment, updates will be conducted using funds from university enrollment-driven resources and faculty research grant awards. The Charles Chesnutt Library has sufficient resources to support the proposed degree program. The library maintains over 365,000 book titles, 170,000 e-book titles, 1,080 current periodical titles, and 410 electronic journal titles. Students, faculty, and staff have access to over 11,600 full-text electronic journal titles through NC Live. In addition, the library provides over 400 full-text article and information databases and websites (including scholarly journals, magazines, newspapers, statistics, biographies, reference works, e-books, maps, and streaming audio and video). The Chesnutt Library is a depository for federal publications through the U.S. Government Printing Office and State of North Carolina Publication Office, providing access to 43,156 item holdings in government documents.
- 9. Existing Programs (Number, Location, Mode of Delivery).** NC State University offers the BS in Materials Science and Engineering, entirely on campus. The enrollment for this program fell by ten students during covid to 115; the total enrollments in the two preceding years was 125 and 124 with 36 and 41 graduates respectively.

#### **10. Potential for Unnecessary Duplication.**

In the discipline of materials science, only NC State offers major and minor degree programs in Materials Science and Engineering. The programs are in the category of engineering and do not involve manufacturing. The University of North Carolina at Greensboro offers a Post-Baccalaureate Certificate in Advanced Materials. There are no other programs involving materials science for undergraduates in the UNC System. In the discipline of manufacturing, NC State offers the Master of Integrated Manufacturing Systems Engineering and Master of Biomanufacturing. North Carolina Agricultural and Technical State University offers the Master of Science in Technology Management with an Advanced Manufacturing concentration. There are no other universities offering manufacturing-related degree programs for undergraduates in the UNC System. Within the UNC System, no university offers an undergraduate degree program combining both materials science and



manufacturing. The proposed degree program would be unique and avoid duplication of curricular options at other universities.

- 11. Feasibility of Collaborative Program.** The proposed degree program would create collaboration opportunities with NC State, the University of North Carolina at Chapel Hill, and The University of North Carolina at Greensboro, which offer the BS, post-bacc certificate, or PhD in Materials Science or Manufacturing degree programs. In addition, collaborations may occur with North Carolina A&T, which houses a center for advanced manufacturing, and the University of North Carolina at Charlotte, which established a Center for Additive Manufacturing of Advanced Ceramics (CAMAC). Nationwide, there is a possibility for collaboration with Northwestern University, which offers Materials Science or Manufacturing degree programs.

### **III. Summary of Review Processes**

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- 1. Campus Review Process and Feedback.** The academic proposal was reviewed and approved by the following: The Department of Chemistry, Physics, and Materials Science Curriculum Committee, Dr. Daniel Autrey, Department Chair, the Lloyd College of Health, Science, and Technology (CHST) Academic Affairs Committee, Dr. Afua Arhin, Dean of the Lloyd College of Health, Science, and Technology, the Faculty Senate Academic Affairs Committee (Chair, Dr. Kimberly Hardy), the Faculty Senate (Chair, Dr. Zahra Shekarkhar), Dr. Nicole Lucas, SACSCOC Liaison, and Dr. Monica Leach, Provost and Vice Chancellor for Academic Affairs.
- 2. UNC System Office Review Process and Feedback.** Throughout the review process, FSU provided relevant information pertaining to program requirements and resources. The institution submitted appropriate documentation and research to support the statements made.

### **IV. Recommendation**

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Staff recommends that Board of Governors approve Fayetteville State University's request to establish the Bachelor of Science (BS) in Materials Science and Manufacturing (CIP 40.1001) effective fall 2023.

**Request for Authorization to Establish  
Bachelor of Science (BS) in Environmental Engineering  
CIP 14.1401  
University of North Carolina at Charlotte**

**I. Program Highlights**

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- The University of North Carolina at Charlotte proposes the establishment of a Bachelor of Science (BS) in Environmental Engineering.
- The proposed program seeks to help satisfy the growing demand for licensed environmental engineers in North Carolina's largest metropolitan region, which is a hub in the Southeast for manufacturing and industrial activity.
- Through coursework that combines training in the core subject matter of environmental engineering with design experience that runs throughout the curriculum, students will have opportunities to assess, analyze, and solve real-world and locally relevant problems related to pollution of soils, water, and the atmosphere. These pollution prevention and engineering issues are particularly important in North Carolina's largest metropolitan area, as well as throughout the region with large sources of drinking water. Students will also learn and apply engineering approaches to providing adequate supplies of safe drinking water, protecting citizens from stormwater flooding, and preventing human impacts from hazardous waste pollution.
- The curriculum will provide students opportunities to engage with the community and work together to solve the unique problems present in a diverse urban environment as well as the areas within the region that are transitioning from farmland to residential and industrial. The proposed curriculum will provide students instruction and design experiences in the core subject matter areas within environmental engineering (water treatment, wastewater treatment, hazardous and solid waste, air quality engineering) and water resources engineering (fluid mechanics/hydraulics, groundwater and surface water hydrology, stormwater control).
- A market survey performed by EAB found that demand for environmental engineers within the state is growing at approximately 2.3 percent per month and currently exceeds that supplied by existing programs.

**II. Academic Program Planning Criteria (UNC Policy 400.1)**

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1. **Relation to Campus Distinctiveness and Mission.** UNC Charlotte is committed to addressing cultural, educational, environmental, health, and social needs of the greater Charlotte region. The proposed program draws from the strength of our existing coursework, allowing students to pursue opportunities not offered elsewhere in the region.
2. **Student Demand.** The proposed program responds to student interest and employment market demand, as validated by a EAB report. The EAB market survey found that demand for environmental engineers within the state is growing at approximately 2.3 percent per month and currently exceeds that supplied by existing programs.
3. **Employment Opportunities for Graduates.** Environmental engineers work in regulatory, compliance, and design functions related to environmental protection of air, water, and soil resources. The drinking water treatment and wastewater treatment sectors are major employers of environmental engineers. Environmental engineers also work to prevent and mitigate flooding,

human health, and infrastructure impacts from stormwater. Because their job functions relate to development and maintenance of essential human infrastructure such as drinking water supply and treatment; stormwater collection; and wastewater collection, treatment, and housing, societal demand for environmental engineers is robust.

Labor market research by EAB concluded that environmental engineering positions are expected to increase 18 percent statewide and 12 percent regionally between 2018 and 2028, which compares favorably to the nine percent statewide and 10 percent regional expected increases in employment over the same period for all occupations.

4. **Impact on Access and Affordability.** The median indebtedness for UNC Charlotte Civil and Environmental Engineering undergraduates is \$26,000. From the U.S. Bureau of Labor Statistics (May 2020), the median annual wage for environmental engineers was \$92,120, with the lowest 10 percent earning less than \$55,450, and the highest 10 percent earning more than \$144,670. A payment of \$288.65 per month is needed to satisfy a \$26,000 student loan at a 6 percent APR. Repayment of this loan for someone earning a starting salary of \$50,600 is about 6.8 percent of their annual salary and 3.8 percent for someone earning the median salary of \$92,120, making this proposed program an affordable option for students. The proposed BS in Environmental Engineering degree will increase both access and affordability in the state's most populous metropolitan region.

Tuition and fees for the 2022-23 full-time (12+ credit hour) rates are as follows:

Full-Time 2023-2024 Undergraduate Tuition and Fees per Year (In Dollars)

Category	Resident	Non-Resident
Tuition	\$3812.00	\$18,474.00
Tuition Differential	\$-0	\$0
Mandatory Fees (Athletics, Student Activities, Health Services, Educational & Technology, Campus Security, Debt Service, ASG)	\$3212.00	\$3212.00
Special Fees (Major Fee)	\$300.00	\$300.00

5. **Expected Quality.** Through coursework that combines training in the core subject matter of environmental engineering with design experience that runs throughout the curriculum, students in the proposed program will have opportunities to assess, analyze, and solve real-world and locally relevant problems related to contamination of soils, water, and the atmosphere. These pollution prevention and engineering issues are particularly important in North Carolina's largest metropolitan areas. Students will also learn and apply engineering approaches to providing adequate supplies of safe drinking water and protecting citizens from stormwater flooding and hazardous waste contamination.

This program is an important addition for UNC Charlotte because it will provide opportunities to engage with the community and work together to solve the unique problems present in a diverse urban environment. Graduates from the environmental engineering program will be critical,

creative, and independent thinkers who will support the interdisciplinary efforts required for the changing environmental needs of society.

6. **Faculty Quality and Number.** The faculty engaged in the proposed program are currently serving students in the Department of Civil and Environmental Engineering (CEE) within the William States Lee College of Engineering. Stability in the department and similarity between the existing BS in Civil Engineering and proposed BS in Environmental Engineering enables the program to be offered with nominal increases in faculty. One vacant faculty position will be reallocated to the proposed program. As the program grows, receipts generated will be used to hire additional faculty to support that growth.
7. **Relevant Lower-level and Cognate Programs.** The proposed program will be supported in coursework by chemistry, mathematics and statistics, biological sciences, geology and earth sciences, and physical and optical sciences among others. Expansion of these fields will be commensurate with their desired growth and not contingent on the demand of the proposed program.
8. **Availability of Campus Resources (library, space, etc.)** There are two labs that are proposed for the environmental engineering degree that are already part of the existing Civil and Environmental program. Therefore, existing campus physical spaces and infrastructure are sufficient to support the program. The library has an expansive set of databases in the proposed area of study. Journal articles and books that are not held by the library can be obtained at other libraries in the state and region through Interlibrary Loan.
9. **Existing Programs (Number, Location, Mode of Delivery).** There is currently one existing undergraduate BS in Environmental Engineering in the University of North Carolina System: NC State University, which operates an on-campus program.
10. **Potential for Unnecessary Duplication.** A market survey performed by EAB found that demand for environmental engineers within the state exceeds that supplied by existing programs and the BS degree in Environmental Engineering will be distinct from those already offered within the UNC System in its locale and its focus on the specific educational and environmental needs of the Charlotte region.

The BS in Environmental Engineering will complement the existing BS in Civil Engineering degree by offering an option that provides the applied, hands-on teaching and learning approach for which the department is known. For 50 years the CEE department at UNC Charlotte has nurtured close, working relationships with the local engineering and water resources professional communities. There is an active, vibrant civil engineering alumni community in the Charlotte metropolitan area. Alumni and other local professionals are guest speakers, mentors, and project reviewers in many of the courses in the civil engineering curriculum.

11. **Feasibility of Collaborative Program.** The proposed program builds on an existing collaborative relationship between the related departments at UNC Charlotte and NC State. Close collaborations through research and career fairs will continue.

### III. Summary of Review Processes

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1. **Campus Review Process and Feedback.** The proposed program was reviewed and approved by the Dean of the William States Lee College of Engineering, the Undergraduate College and Curriculum Committee, Faculty Council, provost and chief academic officer, chief financial officer, and chancellor.
2. **UNC System Office Review Process and Feedback.** Throughout the review process, UNC Charlotte provided relevant information pertaining to program requirements and resources. The institution submitted appropriate documentation and research to support the statements made.

### IV. Recommendation

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Staff recommends that the Board of Governors approve the University of North Carolina at Charlotte's request to establish the Bachelor of Science (BS) in Environmental Engineering (CIP 14.1401) effective fall 2023.