

University of Louisville

New Academic Program Proposal Template

Certificate Programs

After approval of the Letter of Intent, certificate programs are to complete the New Academic Certificate Program Proposal template.

All forms are available at:

<http://louisville.edu/oapa/new-academic-program-approval-page/new-academic-program-approval>

Please ensure all questions are addressed clearly and completely to avoid unnecessary delays. Questions can be directed to the Office of Academic Planning and Accountability through the Program Approval Service Account (PROGAPPR@louisville.edu).

**Send the following materials to the
Program Approval Service Account (PROGAPPR@louisville.edu):**

- Completed Proposal Template
- Proposed Program Curriculum (complete the table found in Appendix A of this proposal template)
- Course syllabi for any new course offerings
- SACSCOC Faculty Roster Form
- CV for Program Director/Coordinator
- Proposal Budget Form
- Letter of Support from the unit Dean
- [Letter of Support from the UofL Libraries](#)
- Letter(s) of Support from any units, departments, or internal or external entities that will be supporting the certificate program
- [Notice of Intent to Offer a Certificate Program Eligible for Financial Aid](#) (Stand-alone Certificates Only – See Section D.5) – Optional

The program approval process will not begin until all of the above documents are received. Please submit all materials listed above at the same time.

General Program Information	
Date:	January 31, 2023
Program Name:	Construction Operations
Degree Level:	<u>Undergraduate:</u> _x_____ <u>Graduate</u> (select one of the following): Post-Baccalaureate _____ Post-Master's _____ Post-Professional _____
Minimum and Maximum Number of Credit Hours required:	12
Accreditation or Licensure Requirements (if applicable):	
CIP Code:	15.1001
Department and Department Chair:	Civil and Environmental Engineering, Zhihui Sun
School/College:	Speed School of Engineering
Program Director and Contact (if different); (please also include title):	Zhihui Sun, z.sun@louisville.edu , Dept chair
Is an approval letter from the Education Professional Standards Board (EPSB) required for this program? If so, attach a copy to this proposal.	No.
Proposed Implementation Date for Program (semester and year):	Fall 2023
Program Length (1 semester, 1 year or Average time to Completion)	3 years for BSCE students, 1 year for non-traditional students
Anticipated Date for Granting First Degree:	Spring 24
Identify whether the program is 100% online, 100% face-to-face, or a combination of the two:	Combination of the two
If the program plans to offer the certificate program as a stand-alone credential eligible for Title IV Financial Aid – See Section D.5	Complete Notice of Intent Form - http://louisville.edu/oapa/gainful-employment-policy

A. Centrality to UofL’s Mission and Strategic Plan

The certificate program is to adhere to the role and scope of the University of Louisville as set forth in its mission statement and as complemented by UofL’s strategic plan.

<p>1. Provide a brief description of the program (copy the abstract provided in the program’s Letter of Intent here). (250 words or less; program’s purpose/focus, primary areas of study, intended audience, degree level, length of the program, goals/objectives, rationale for program, skills or knowledge that students will acquire, relationship of program to general field).</p>
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This proposal aims to develop an undergraduate certificate program in the Civil and Environmental Engineering Department within the JB Speed School of Engineering. With the passing of the Bipartisan Infrastructure Law (Infrastructure Investment and Jobs Act), there is a tremendous demand for civil engineers, who help to design and build our infrastructure and to assure the competitiveness of the United States. Traditional civil engineering program content covers sub-disciplines of structural engineering, geotechnical engineering, transportation engineering, water resources/environmental, and construction. The civil engineering degree program provided by our department covers the first four areas, while “construction” is the only missing element. Considering one-third to one-half of our undergraduate students complete their required co-ops with construction companies and receive permanent job offers in construction upon their graduation, offering a certificate program in construction operations will not only provide these students with needed skillsets and knowledge to be better prepared for future challenges, but also a proof of this education for potential employers. Currently, none of the Kentucky universities (UK, UofL, and WKU) provides such a construction related certificate program for students in civil engineering. Some universities (EKU, NKU, WKU, Murray State, and Morehead U) provide degree in Construction Management Technology, which is not an engineering degree and would not allow graduates to achieve Professional Engineering licensure. Providing a certificate in construction operations for civil engineering students will help to expand their professional engineering career paths and provide more/better opportunities for leadership roles in construction companies.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

The mission of the Department of Civil and Environmental Engineering is to serve the university, the Commonwealth of Kentucky, and the engineering profession by providing high quality educational programs to all students; engaging in research and scholarship that will extend knowledge; and assisting the economic development of the regional, state, and national economies through technology transfer.

This mission statement was developed by the CEE faculty with extensive input from the practitioner and student advisory councils, and is consistent with the missions of the University and Speed School of Engineering.

The proposed undergraduate certificate in Construction Operations will better serve the mission of the department by expanding students’ engineering professional path, extending students’ knowledge in Civil Engineering, and also meeting regional, state, and national job market demands.

3. List the objectives of the proposed program.

Explain how the objectives support the university and unit mission, strategic priorities, and institutional and societal needs.

The educational objective of this proposed undergraduate certificate program is to provide students with training in skillsets needed for construction related duties, such as land surveying, material testing, construction equipment, and construction management.

4. Clearly state the admission, retention, and degree completion standards designed to encourage high quality.

Please be clear and specific.

- Admissions requirements

Any student enrolled in our BSCE program is admissible to this certificate program. Students from other units or schools who meet the prerequisite requirements of ENGR101, PHYS298, and CEE254 or equivalency are also admissible.

- Graduation requirements

This certificate program requires the completion of 12 credit hours with a GPA of 2.25 or higher to graduate.

- Retention

Among the required courses, CEE 260/261 (sophomore year) and CEE 530 (senior year) are already in the current BSCE curriculum. CEE 540 Construction Management and CEE 541 Construction Equipment and Practice are two relatively new graduate courses that were already developed and taught within the department. Speed School policy allows senior students take up to 6 credit hours of graduate courses without the permission from the department chair. With Construction Management being offered in the fall semester, and the Construction Equipment and Practice being offered in the spring semester (both are offered online), senior CEE students can take these two additional courses to complete the certificate without undue strain. These additional course credits can also transfer to their graduate program if they choose to continue. Thus, this proposed certificate program will help retention of CEE students and encourage them to move on to our MEng program.

B. Program Quality and Student Success

1. What are the intended student learning outcomes of the proposed program?

Student outcome 1: The students who attain a certificate in Construction Operations will be able to explain the problems that are typically encountered in the profession.

Student outcome 2: Students who attain a certificate in Construction Operations will be able to analyze technical information in both written and oral form.

Student outcome 3: Students who attain a certificate in Construction Operation will demonstrate an ability to execute technical skills and proper tools needed for contemporary construction practice.

2. Describe how each program-level student learning outcome will be assessed (including when data will be collected and how assessment results will be used to improve the program).

Student outcome 1:

In order to explain problems, our students must be able to employ mathematics, science, and engineering principles. We will use CEE 260 (each Fall semester) to assess this outcome. If the goal is not met, the class syllabus and content will be revisited for improvement.

Student outcome 2:

In order to successfully analyze technical information, our students must be able to communicate effectively. We will use CEE 530 (each Spring semester) to assess this outcome. If the goal is not met, the class syllabus and content will be revisited for improvement.

Student outcome 3:

In order to execute correct technical skills and tools, our students must widely participate in lab events. We will use CEE 261(Fall), CEE 530 (Spring), and CEE 541 (Spring) to assess this outcome. If the goal is not met, the class syllabi and contents will be revisited and modified for improvement.

3. For each learning outcomes, provide direct indicators (and indirect, where possible) of achievement of the outcome, target(s) for the outcome, and frequency of data collection.

Student outcome 1:

Measure: students taking CEE 260 are able to employ mathematics, science, and engineering principles to complete land surveying projects.

Target: More than 50% of the students must obtain 3 or above on a scale of 1 to 4 in the assigned project.

Frequency of data collection: Class data will be collected annually when CEE 260 is taught.

Student outcome 2:

Measure: Students taking CEE 530 should be able to present the selected technical information in the format of a technical paper and an oral presentation.

Target: More than 50% of the students must obtain 3 or above on a scale of 1 to 4 in the final project.

Frequency of data collection: Class data will be collected annually when CEE 530 is taught.

Student outcome 3:

Measure: Students taking CEE 261, CEE 530, and CEE 541 have good understanding of the purpose of each field testing method and functions of the testing tools.

Target: More than 50% of the students must obtain 3 or above on a scale of 1 to 4 in their course projects.

Frequency of data collection: Class data will be collected annually when CEE 261, CEE 530, and CEE 541 are taught.

4. Course Delivery Methods.

Please answer the following:

a) Will this be a 100% distance learning program? Yes No

b) Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)? Yes No

If yes, please check all that apply below.

- Distance Learning
- Courses that combine various modes of interaction, such as face-to-face, videoconferencing, audio-conferencing, mail, telephone, fax, e-mail, interactive television, or World Wide Web
- Technology-enhanced instruction
- Evening/weekend/early morning classes
- Accelerated courses
- Instruction at nontraditional locations, such as employer worksite
- Courses with multiple entry, exit, and reentry points
- Courses with "rolling" entrance and completion times, based on self-pacing
- Modularized courses

5. Is there a specialized accrediting agency related to this program? Yes No

a. If yes, please identify the agency.

b. If yes, will the program seek accreditation?

6. Describe the library resources available to support this program.

Please also submit a letter of support from the UofL Libraries. You can request this letter at <https://library.louisville.edu/forms/new-program-proposal>.

Access to the qualitative and quantitative library resources must be appropriate for the proposed program and should meet recognized standards for study at a particular level or in a particular field where such standards are available.

C. Program Demand/Unnecessary Duplication

1. Provide the projected enrollment and graduation numbers for the first five years.

Academic Year	Degrees Conferred	Headcount Enrollment (Fall term)
2023-2024	8	10
2024-2025	8	10

2025-2026	8	10
2026-2027	8	10
2027-2028	8	10

2. Indicate any efforts to address student educational and workforce needs or to maximize student success, for both traditional and non-traditional students.

Include any data on student demand; career opportunities at the regional, state, and national levels; and any changes or trends in the discipline(s) that necessitate a new program.

There is a growing need in workforce for civil engineers, especially those with knowledge and training in construction. As populations in US continue to grow, our infrastructure demands also grow. Critical areas in this sector include the maintenance and construction of new roadways, the management of water supply, waste filtration and residential real estate development in urban spaces. One of the key benefits of civil engineering is that it is ‘recession-proof’. In a healthy economy, civil engineers design and build new infrastructure; in a recessed economy, civil engineers repair/retrofit existing ones. According to US Bureau of Labor Statistics, employment of civil engineers is projected to grow 8 percent from 2020 to 2030 nationally. About 25,000 openings for civil engineers are projected over the decade. In Kentucky alone, there were 1,580-3,070 employment opportunities of civil engineers in May 2021, and the projection of job growth of civil engineers is 9% statewide in the next ten years. There are currently hundreds of active new job openings each month in Kentucky, and this number keeps growing. With the passing of the Infrastructure Investment and Job Acts, there will be new construction jobs related to new infrastructure and maintaining of existed infrastructure.

While any student is welcome to enroll, this certificate program is specifically designed to accommodate three types of students: students enrolled in the BSCE, students enrolled in the BSCE with an intention to continue to MEng program; students enrolled in similar degree or associate degree programs that meet the admission requirements for the certificate program. For those traditional students who are already enrolled in our degree programs, this certificate can be used as a proof of their chosen focused area and will be helpful to those who want to make construction his/her career. This will also enhance the competitiveness of our graduates in the construction job market. This certificate program also provides non-traditional students with a continuing education opportunity. Our online courses are highly accessible and students can study the course contents on their own paces.

3. Specify/highlight any distinctive qualities of the proposed program.

There are three schools in Kentucky that provide BS degrees in Civil Engineering (UK, UofL, and WKU). None of the schools offers an undergraduate degree program in construction engineering. NKU provides an associate degree program in Construction Technology. EKU, WKU, Murray State, and Morehead all provide degrees in Construction Management Technology. While a technology program focuses on training technicians and technologists, it does not provide benefits to civil engineers and will not help to meet the high market demand on civil engineers or construction

mangers. Therefore, providing an undergraduate certificate program in construction operations will provide the needed training to our future civil engineers. This will be a **unique** program in the Commonwealth of Kentucky.

4. Does the proposed program serve a different student population (e.g., students in a different geographic area, non-traditional students, etc.) from existing programs?

If yes, please explain.

While we mainly offer this certificate program to the students who are enrolled in the BSCE, students enrolled in similar degree or associate degree programs that meet the admission requirements for the certificate program are also welcome to apply.

5. Will this program replace or enhance any existing program(s) or tracks, concentrations, or specializations within an existing program? Yes No

If so, please specify.

This program does not replace any existing program, track, concentration, or specializations that exist within the University of Louisville. Instead, it strengthens and enhances the current BSCE and MEng programs by increasing the construction related elements in the current BSCE curriculum. Traditional civil engineering program content covers sub-disciplines of structural engineering, geotechnical engineering, transportation engineering, water resources/environmental, and construction. The civil engineering degree program provided by our department covers the first four areas, while “construction” is the only missing element. Considering one-third to one-half of our undergraduate students complete their required co-ops with construction companies and receive permanent job offers in construction upon their graduation, offering a certificate program in construction operations will not only provide these students with needed skillset and knowledge to be better prepared for future challenges, but also a proof of sound education to show their qualification to the potential employers.

The feedback we collected through the 2018 CEE alumni survey reflects the opinion of CEE graduates that having knowledge of construction engineering would not only better prepare them to take the challenges in their daily job, but also enhance their competitiveness in the job market. A round table discussion between the CEE department chair and local employers also suggests the addition of construction related topics to the BSCE curriculum.

6. How will the program support or be supported by other programs and/or units within the institution? Please also describe potential for collaboration with other programs within the institution.

The program is housed in the Civil and Environmental Engineering Department. We support any students who are interested in this program. Students outside Civil can also enroll in the program, assuming the prerequisites are met.

The program has a potential for collaboration with the Engineering Management program housed in the Industrial Engineering Department. Students in the EM program with interest in construction are welcome to enroll in CEE 540 Construction Management and CEE 541 Construction Equipment and Operations.

7. Describe the proposed program's relationship with programs at other institutions or external organizations (if applicable).

There are three schools in Kentucky that provide BS degrees in Civil Engineering (UK, UofL, and WKU). None of the schools offers an undergraduate degree program in construction engineering. NKU provides an associate degree program in Construction Technology. EKV, WKU, Murray State, and Morehead all provide degrees in Construction Management Technology. While a technology program focuses on training technicians and technologists, it does not provide benefits to civil engineers and will not help to meet the high market demand on civil engineers or construction managers. Therefore, providing an undergraduate certificate program in construction operations will provide the needed training to our future civil engineers. This will be a **unique** program in the Commonwealth of Kentucky.

D. Cost

1. Will this program require additional resources? Yes No

If so, please provide a brief summary of new or additional resources that will be needed to implement this program over the next five years. Document the expected cost/expenditures in the table below.

2. Complete the SACS Faculty Roster Form found at the link below and submit it with this proposal.

Found at:

<http://louisville.edu/oapa/new-academic-program-approval-page/new-academic-program-approval>

Also submit a copy of the program director's CV.

3. Are new or additional faculty needed? Yes No

- a) If yes, please explain, indicating the number and role of each new faculty member and whether they will be part-time or full-time. Specify if graduate assistants are included in the additional faculty resources needed.
- b) If new faculty are needed, please provide a plan to ensure that appropriate faculty resources are available, either within the institution or externally, to support the program.
- c) What is the projected faculty/student ratio for the program?

4. Will this program impact existing programs and/or organizational units within UofL?
Yes No

If so, please describe the impact.
(examples: reallocation of resources, faculty or staff reassigned, changes to other programs and/or course offerings, reduction or increase in students served, any other possible impact) .

The program will have positive impact on the current program. Because Speed School allows BS students to take up to two graduate level courses in their senior year, students enrolled in this program will only need to take 8 additional courses (instead of 10) to get their MEng degree. It will attract more BSCE students to move on to MEng program, thus have a positive impact on student retention.

- **Complete the New Program Budget Spreadsheet.**

Found at:
<http://louisville.edu/oapa/new-academic-program-approval-page/new-academic-program-approval>

Notes for completing the Budget Spreadsheet:

- Provide an estimate of the level of new and existing resources that will be required to implement and sustain the program.
- Any existing resources reallocated to support this new offering should be estimated as an “internal reallocation” in both the Funding Sources and Expenses sections of the budget.
- Any new resources for which the unit/department plans to allocate funding should be listed as “allocation” in both the Funding Sources and Expenses sections of the budget.
- The program proposal is to be developed without the expectation of tuition-sharing or recovery agreements with the Provost. This approach ensures that the “cost” of operating the program is somewhat reflective of reality.
- For every place you add numbers (in both the Funding Sources and Expenses spreadsheet) provide a written explanation for the numbers, including how they were calculated. The CPE system won’t let us submit the proposal without explanations for the budget numbers.
- The budget for the proposed program is to be in alignment with the latest budget assumptions (provided below as of 10/7/19) from the Budget Model Workgroup.

Undergraduate*
70% (net of mandatory student fees) of resident per credit hour tuition rate (i.e., the listed rate on the bursar’s website) charged to undergraduate students is allocated to the academic unit where the instruction takes place. Every credit hour is treated the same under the model.

Graduate/Professional*
Graduate: 75% (net of mandatory student fees) of tuition review revenue allocated according to a student’s home academic program.

Professional: 85% of tuition revenues generated from professional degree (law, dentistry, medicine) programs allocated to the student's home academic program. For purposes of the budget model, doctoral programs fall in the Professional category.

*These definitions of the Budget Model are as of 10/7/19 and are subject to change.

Note that there are three tabs to the Budget spreadsheet.

Funding Sources tab:

- Indicate funding to be supplied by the unit (include direct funding & In-kind support):
- Internal allocation and reallocation are those estimated dollars needed to fund the start-up and support the new academic program – typically defined as faculty, administrative/staff, and operational expenses.
- When calculating funding, consider the impact on current faculty workloads.
- Include the expected tuition revenue generated by anticipated student enrollment.
- If the program will use existing faculty or other existing resources, the amount of funding represented by those resources are to be listed in the Funding Sources table as reallocation of funds.
- If reallocation of “existing” funds are included in the Funding spreadsheet, the numbers should also be reflected in the Expenses spreadsheet.
- If the unit has allocated funds for any new expenses in the Funding Sources spreadsheet, the numbers should also be added to the Expenses spreadsheet.

Expenses tab:

- You do not have to estimate classroom space unless you believe that existing space is not sufficient to support the academic program.
- Any expenses identified as “existing” funds in the expenses spreadsheet should also be added to the Funding Sources spreadsheet as either internal reallocation or internal allocation.

Funding Source/Expenses Combined tab:

- This spreadsheet will pre-populate based upon the numbers entered into the Funding Sources and Expenses spreadsheets. The goal is to have more funding than expenses.

5. Financial Aid for Certificate Programs

Does the unit plan to offer this program as a stand-alone certificate eligible for Title IV Financial Aid?

Yes No

If yes, please review the following information:

Effective July 1, 2020, University of Louisville (UofL) students enrolled (half-time or more) in stand-alone certificate programs designated as financial aid eligible can be awarded funds. In order for a UofL certificate program to be deemed eligible for Title IV federal aid, it must:

- be one academic year in duration;
- be at least 24 credit hours for undergraduate certificates; be at least 9 credit hours for graduate certificates; and
- prepare students for gainful employment in a recognized occupation.

Academic units offering certificate programs must certify these credentials as Title IV eligible programs by submitting a [Notice of Intent to Offer a Certificate Program Eligible for Financial Aid](#). See the Gainful Employment Policy website for the intent form and other information - <http://louisville.edu/oapa/gainful-employment-policy>

Appendix A Program Curriculum

In the table below, provide the program curriculum and any options; indicate total number of credit hours required for degree completion.

- Include full course names and course descriptions.
- Where they exist you should report actual course numbers, titles, and descriptions in the course template. If the program has no specific course numbers required under a particular heading, provide a description of the type of course(s) required in the “course title” column and the number or range of credit hours required.
- Provide a copy of the course syllabus for any new courses developed.

Prefix & Number	Course Title	Course Description	Credits	Required?	New	Existing	Revised	Offered Online?
CEE 260	Field Measurement		2	Yes		√		No
CEE 261	Field Measurement Lab		1	Yes		√		No
CEE 530	Construction Materials		3	Yes		√		No
CEE 540	Construction Management		3	Yes		√		Yes
CEE 541	Construction Equipment and Operations		3	Yes		√		Yes

TOTAL CREDITS			12					