

TO: 2021-22 Chair of Senate Executive Committee
FROM: Sarah S. LeBlanc, Chair, Curriculum Review Subcommittee (20-21)
DATE: April 15, 2021
SUBJECT: Education STEM Proposal

The Curriculum Review Subcommittee supports the proposal from the School of Education for their concentration in Elementary STEM. We find that the proposal requires no Senate review.

Approving

Not Approving

Absent

Jaiyanth Daniel
Behin Elahi
Laurel Campbell
Shannon Johnson
Carol Lawton
Sarah LeBlanc
Haowen Luo

Teresa Hogg
Sierra Miller

Terri Swim, exofficio (non-voting member)

Degree/Certificate/Major/Minor/Concentration Cover Sheet

Date:

Institution: Purdue

Campus: Fort Wayne

School or College:

Department:

Location: 80% or more online: Yes No

County:

Type:

Program name:

Graduate/Undergraduate:

Degree Code:

Brief Description:

Rationale for new or terminated program:

CIP Code:

Name of Person who Submitted Proposal:

Contact Information (phone or email):

Request for a New Concentration in Elementary STEM

- I. Name of proposed major, or concentration

Elementary STEM

- II. Title of degree to be conferred

Bachelor of Science in Education (B.S.Ed)

- III. Field of study, department, and college involved

Education, Teacher Education, School of Education

- IV. Objectives of the proposed major or concentration

At the completion of the Elementary STEM concentration, students will be able to:

1. apply the science and engineering process standards to defining problems and designing solutions to engineering design problems.
2. design and implement grade appropriate instructional experiences for students in grades K-2 and 3-5 for science and engineering
3. demonstrate competency in the five core concepts of computer science, as listed in the Indiana Academic Standards: (1) Computing Devices and Systems, (2) Networking and Communication, (3) Data and Information, (4) Programs and Algorithms, and (5) Impact and Culture.
4. design and implement grade appropriate instructional experiences for students in grades K-2 and 3-5 around the five core concepts of computer science.
5. design and implement K-5 instruction that appropriately integrates engineering and computer science instruction into the core subject areas of English Language Arts, mathematics, science, and social studies.

- V. Proposed Date of Initiation

Fall 2022

- VI. Describe the relationship of the proposed major or concentration to the mission of the campus or the department

The proposed concentration in Elementary STEM is only for students pursuing the B.S.Ed in elementary education within the School of Education. The proposed concentration aligns with the Purdue University Fort Wayne's brand pillars as a STEAM institution because it blends knowledge of science, engineering, and technology with pedagogical knowledge to create powerful teachers of elementary children.

VII. Describe any relationship to existing programs within the campus

Currently, five concentrations are available for elementary education majors: (1) Exceptional Needs; (2) Language Arts; (3) Math; (4) Science; or (5) Social Studies along with two Dual License programs: (1) Early Childhood Education and (2) Mild Intervention. This proposal provides an additional Concentration to the existing options within the B.S.Ed. in Elementary Education. This proposed Concentration also prepares teacher candidates to earn a second licensure in Elementary STEM to compliment the primary licensure as Elementary Generalist (see <https://www.doe.in.gov/sites/default/files/licensing/elementary-stem-standards.pdf>)

VIII. Describe any cooperative endeavors explored and/or intended with other institutions or organizations

The 18 hour concentration in Elementary STEM would be taught in collaboration with three other departments on campus: physics, computer science, and engineering technology. Thus, I have collaborated with the chairs of those departments (i.e., Mark Masters, Beomjin Kim, and Gary Steffen) to select courses that are appropriate to our needs, meet IDOE standards, and are offered on a regular basis.

IX. Describe the need for the major or concentration

In 2016, Indiana's Department of Education created the new Indiana Academic Standards for science, engineering, and computer science (see <https://www.doe.in.gov/standards/science-computer-science>). In 2018, the Indiana legislature passed SEA 172 to encourage their implementation, requiring computer science education be included for students in grades K-12 at every school (See <https://www.doe.in.gov/wf-stem/computer-science>). The Elementary STEM concentration offers a pathway to licensure in Elementary STEM, a new license made available by the State of Indiana in Summer 2020. Since the Indiana legislature is now requiring all K-12 schools to offer computer science by 2022, we anticipate the demand for STEM prepared teachers at the K-5 level to increase significantly in the coming years. Offering this Concentration and path to licensure positions PFW to be a leader in STEM education for the Northeast Indiana region.

X. Describe the resources required over and above current levels to implement the proposed major or concentration*

This proposed Concentration utilizes already existing courses and resources, with the exception of one newly proposed course: EDU 32900 Engineering in the Elementary and Middle Schools, to be taught by existing faculty. No additional resources are required.

XI. A Liaison Library Memo

See attached.

XII. Proposed curriculum

The 18 hour concentration in Elementary STEM would be composed of the following courses and has been discussed with the chairs of the departments of physics (Mark Masters), computer science (Beomjin Kim), and engineering technology (Gary Steffen):

Elementary STEM Concentration (18)	
EDU 20001 Introduction to Scientific Inquiry	3
PHYS 21000 Nature of Science	3
EDU 20002 Computers in Education (CS concentration)	3
EDU 32900 Engineering in the Elementary Classroom	3
CS 11200 Survey of Computer Science	3
Select one of the following: ET 10600 Intro to Engineering Technology or ENGR 12700 Engineering Fundamentals I	3

Three of these courses (EDU 20001, PHYS 21000, EDU 20002) are already required of all students pursuing the B.S.Ed. in Elementary Education.

Liaison Librarian Memo

Date: March 16, 2021

From: Denise Buhr

To: Terri Swim

Re: Concentration in Elementary STEM

Describe availability of library resources to support proposed new program:

Helmke Library subscribes to a variety of education- and STEM-related databases and highlights those resources on various topic guides for education, computer science, engineering and technology, and mathematical sciences, as well as resources for biology, chemistry, geosciences, and physics. Through these databases, students have access to thousands of current and historical journals. The physical collections (books, CDs) of education and STEM materials are reviewed on a rotating basis and new materials are purchased regularly to ensure that the most up-to-date information is available.

Comments:

Since it is anticipated that no new resources will be needed beyond what is regularly purchased through the library's annual materials budget, I am confident that the resources of Helmke Library will support both the educational and STEM needs in the new concentration. The one suggested new journal, "Contemporary Issues in Technology and Teacher Education," is open access and has now been added to the library's catalog. I would note that due to the courses in this concentration and the subjects covered, students may prefer to contact Sarah Wagner, the liaison librarian for Computer Science, Engineering & Engineering Technology, Mathematical Sciences, and Physics. This could place a greater demand on her time but between the two liaison librarians, we will be able to accommodate any and all research questions and consultations.

Denise Buhr

16 March 2021

Liaison Librarian Signature

Date

Please email academic_program@pfw.edu with questions about this form.
Send signed original to Associate Vice-Chancellor for Academic Programs
Kettler Hall, Room 174