

INDIANA UNIVERSITY ACADEMIC AFFAIRS

**Memorandum of Agreement (MOA)
For Phase 2 of the Development of a Collaborative Academic Program
Graduate Certificate in Biology**

Indiana University Bloomington, College of Arts and Sciences
Indiana University East, School of Natural Science and Mathematics
IUPUI, School of Science
Indiana University Kokomo, School of Sciences
Indiana University Northwest, College of Arts and Sciences
Indiana University South Bend, College of Liberal Arts and Sciences
Indiana University Southeast, School of Natural Sciences

Date: November 28, 2017

With a spirit of respect and partnership, the undersigned campus representatives and university representatives agree to collaborate with each other, the Office of the Executive Vice President for University Academic Affairs, Office of Collaborative Academic Programs and the Office of Online Education and develop, deliver, and maintain a Collaborative Academic Program for the Graduate Certificate in Biology. The details of this collaboration are documented in three Memoranda of Agreement, including this Phase 2 MOA.

Phase 2: Curriculum and Admission Requirements

1. Statement of need and program demand

The Graduate Certificate in Biology will provide graduate-level instruction in biology to students interested in obtaining advanced skills and knowledge in this area. These may include instructors of biology teaching in community colleges and high school dual-credit instructors, as well as working professionals. For those students who are teaching or plan to teach biology, certificate courses will help them integrate new concepts and approaches into their teaching, thereby improving the quality of instruction and learning outcomes for their students.

The certificate allows instructors of introductory college-level biology courses to partially meet the faculty educational standards of many post-secondary institutions. These requirements usually include a master's degree in the discipline, or a master's degree in another field (e.g., education) plus 18 hours in the discipline. With the increased attention that the Higher Learning Commission and other accrediting bodies are giving to the issue of faculty qualifications, current faculty are seeking ways to meet the requirement.

Biology is one of the highly enrolled dual-credit courses in Indiana. There are several dual-credit teachers across the state who could complete this certificate to meet HLC standards. In addition, this certificate is expected to be popular among out-of-state teachers and others who wish to develop further their understanding of biology.

2. Faculty governance and curriculum approval processes

The MOA must adhere to the following principles:

- a. **Curriculum must stay under faculty governance.** Memorandum agreements must recognize that the curriculum belongs to faculty, and that faculty are responsible for curriculum integrity.
- b. **Curriculum approvals must use normal operations of university and collaborating campuses.** Because academic program governance occurs at the campus level, the curriculum must be approved by the relevant campus faculty committee(s). Accrediting bodies such as HLC may require documentation that appropriate campus approvals have been obtained.

3. Curricular framework

a. Program Goals:

The coursework in the Graduate Certificate in Biology will increase the student's theoretical knowledge in the discipline of Biology. The certificate will serve two primary audiences:

- A) Dual-Credit and Community College Instructors teaching courses in Biology, and
- B) Working professionals who seek to advance their knowledge.

The Graduate Certificate in Biology will support the reach and quality of Indiana's dual-credit courses by providing:

- A practical and economical online program of study to high-skilled and motivated teachers with advanced training in the field of Biology;
- A challenging and coherent curriculum that meets the Higher Learning Commission's dual-credit accreditation standards for graduate training in Biology.

b. Program Learning Outcomes:

Upon completion of the certificate, students will be able to demonstrate:

1. Fluency with scientific literature

Students will be able to:

- 1a. Retrieve, comprehend and critically evaluate information from the scientific literature.
- 1b. Effectively communicate understanding of scientific literature.

2. Expertise (breadth and depth) in Biology

Students will be able to:

- 2a. Demonstrate the ability to break down and analyze biological concepts and processes for undergraduate students.

2b. Demonstrate an achievement of depth of knowledge across a selection of sub disciplines in Biology.

3. Ability to develop and analyze hypotheses and experiments

Students will be able to:

3a. Identify and develop methodology to test hypotheses.

3b. Critically analyze experimental design and conclusions.

4. An understanding of the impact of Biology on society.

Students will be able to:

4a. Analyze processes in everyday life using biological principles.

4b. Communicate the relevance of biological principles for society in oral and written format.

a. Pre-requisite coursework

Bachelor's degree.

b. Required courses and time to completion

Working professionals will be able to complete the Certificate in Biology in 15 to 18 months of consecutive part-time enrollment. Students who can take more than one course at a time may move more quickly.

Curriculum map

The Graduate Certificate in Biology will cover the following content areas -

1. Evolution
2. Ecology / Environmental Biology
3. Organismal Biology
4. Cell / Molecular Biology / Biochemistry
5. Genetics / Bioinformatics and Genomics
6. Anatomy and Physiology
7. Developmental Biology

See detailed curriculum map below -

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Course Number	Title (Credit Hours)
<u>Core Course</u>	Required course
BIOL-T 570	Evolution (3 Cr)
<u>Molecular-Cellular Level Electives</u>	Students will pick at least 2 courses from this category
BIOL-T 571	Introductory Biochemistry (3 Cr)
BIOL-T 572	Cell Biology (3 Cr)
BIOL-T 573	Macromolecular Structure & Interaction (3 Cr)
BIOL-T 574	Immunology (3 Cr)
BIOL-T 575	Molecular Biology (3 Cr)
BIOL-T 576	Bioinformatics: Theory and Application (3 Cr)
BIOL-T 577	Molecular Genetics and Genomics (3 Cr)
	Additional courses may be added to this list subject to prior approval from Graduate Certificate in Biology faculty committee.
<u>Organismal Level Electives</u>	Students will pick at least 2 courses from this category
BIOL-T 580	Developmental Biology (3 Cr)
BIOL-T 581	Neurobiology (3 Cr)
BIOL-T 582	Advanced Field Zoology (3 Cr)
BIOL-T 583	Problems in Genetics - Higher Organisms (3 Cr)
BIOL-T 584	Marine Community Ecology (3 Cr)
BIOL-T 585*	Model Organisms in Research (3 Cr) (*Counted only once)
BIOL-T 586	Animal Nutrition (3 Cr)
BIOL-T 587	Ornithology (3 Cr)
BIOL-T 588	Horticultural Plants: Biotechnology, Physiology, and Development (3 Cr)
BIOL-T 589	Ecology (3 Cr)
	Additional courses may be added to this list subject to prior approval from Graduate Certificate in Biology faculty committee.
<u>Capstone Course</u>	(Required course – Pick any one of the following four courses)
BIOL-T 585*	Model Organisms in Research (3 Cr)
BIOL-T 590	Critical Analysis of Scientific Literature (3 Cr)
BIOL-T 591	History of Life (3 Cr)
BIOL-T 592	Social Implications of Biology (3 Cr)

4. Agreements regarding common use of textbooks, e-texts, and/or other learning resources.

Specify any agreements regarding the use of learning resources in the program:

a. Textbooks and e-texts

Selection and use of textbooks, e-texts, and other learning resources are at the discretion of the faculty member teaching the course, and will be based on the agreed-upon course description and learning outcomes for the course. As per IU policy and practice, a student from one campus who is in a course taught by a faculty member from a different campus will have access to electronic resources from the faculty member's campus library for the duration of the course.

5. Admission and other requirements

a. Admission requirements. The policies described below will serve the needs of the target audience as reflected in the statement of purpose for the program in MOA 1.

Admission criteria will follow the procedures in place at the campus of enrollment with the following certificate specific criteria.

- Bachelor's degree;
- 3.0 minimum undergraduate GPA;
- Official transcripts from each undergraduate institution;
- 250-word personal statement explaining background and reasons for entering the program.

b. Requirements for transfer, satisfactory progress, and dismissal from the program.

Specify agreements regarding requirements for students transferring to this program from other programs, including on-campus programs. Specify criteria for satisfactory progress in the program, criteria for dismissing students from the program, and any process for permitting dismissed students to re-enroll.

Because the collaborative online Certificate in Biology is distinct from related on-campus or online programs, admission to this program does not imply admission to any other program, including on-campus graduate programs offered by collaborating campuses.

Transfer credit, satisfactory academic progress, and dismissal from the certificate program will follow University Graduate School policy as published in *University Graduate School Bulletin* and *Graduate Handbook*. Current policy is as follows:

Transfer Credit: With the approval of the steering committee and in accordance with pertinent IU policies, students may transfer in one three-credit course in partial satisfaction of certificate requirements. No course may be transferred from another institution unless the grade is a B or higher.

Satisfactory Academic Progress and Dismissal: Grades B (3.0) average or above required. Any semester's work averaging less than B will result in the student being placed on academic probation. Accumulation of three individual course grades of C (2.0) or lower for graduate credit

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will result in dismissal of the student from the program. The program evaluates each student's progress toward the degree every year.

Dismissed students must sit out at least one semester. The curriculum committee will read petitions from student seeking re-entry on a rolling basis. The committee will look for evidence that the student has addressed the underlying issues and obstacles to academic success. Petitions must be submitted at least six weeks ahead of the academic term for which the student seeks enrollment. Students should contact their campus of enrollment to determine where to send the petition.

6. Processes for assessment and evaluation.

*Articulate agreed upon processes for student assessments and end-of-course evaluations.
Develop a schedule for review and revision of courses in the program.*

The steering committee of the Graduate Certificate in Biology will develop a primary trait rubric for learning outcomes 1, 2, 3 and 4, and post copies to Canvas. Each instructor will evaluate at least one assignment using the rubric to assess how students in the course met its designated learning outcome. The steering committee will hold an annual meeting to review the course rubrics and consider how the curriculum can be improved.

PHASE 2 SIGNATURES:

Richard Hardy, Professor of Biology and Associate Chair of Teaching, Department of Biology,
College of Arts and Sciences, IU Bloomington

Parul Khurana, Associate Professor of Biology and Coordinator, Department of Science,
School of Natural Science and Mathematics, IU East

James Marrs, Professor and Director of Graduate Studies, Department of Biology,
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Lina Rifai, Associate Professor of Vertebrate Biology,
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Peter Avis, Department Chair and Associate Professor of Biology, Department of Biology,
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Thomas Clark, Professor and Chair, Department of Biological Sciences,
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Hitesh Kathuria, Assistant Vice President, University Academic Affairs,
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