# Science Education - Biology Concentration License: Life Science

## Grade Levels 5-12 REPA 3

## Purdue University Course Catalog 2023-2024

CONTEN	ι <del>τ</del>		<u>Credit Hours</u>
Overall	CDA for Piolo	ay Concentration courses with the Departmental /Program Major Courses	02-07
must he	2 50 or area	tor	
must be	2.50 01 9120		
<u>Required</u>	d Science Edu	ucation Core Courses	
Required	l Chemistry C	Course	
CHM	12901	General Chemistry with a Biological Focus	5
Required	l Computing	Option (Select one)	
CS	15900	C Programming <b>OR</b>	3
CS	17600	Data Engineering in Python <b>OR</b>	3
CS	17700	Programming with Multimedia Objects	4
Required	l calculus Cou	urses (Select One Pair)	
MA	16100	Plane Analytic Geometry and Calculus I	5
MA	16200	Plane Analytic Geometry and Calculus II	5
		OR	
MA	16500	Analytic Geometry and Calculus I	4
MA	16600	Analytic Geometry and Calculus II	4
		OR	
MA	16010	Applied Calculus I	3
MA	16020	Applied Calculus II	3
Required	l Physics Cou	rses (Select One Pair)	
PHYS	17200	Modern Mechanics	4
PHYS	27200	Electric and Magnetic Interactions	4
		OR	
PHYS	17200	Modern Mechanics	4
PHYS	24100	Electricity and Optics	3
PHYS	25200	Electricity and Optics Laboratory	1
		OR	
PHYS	22000	General Physics	4
PHYS	23400	General Physics	4
Required	l Statistics Co	burse	
STAT	50300	Statistical Methods for Biology	3
Biology (	Concentratio	<u>n</u>	
Required	1		
BIOL	12100	Biology I: Diversity, Ecology, and Behavior	2

BIOL	13100	Biology II: Development, Structure, and Function of Organisms	3
BIOI	23100	Biology III: Cell Structure and Function	3
	22200	Laboratory in Diology III: Coll Structure and Eurotion	3
BIOL	23200	Laboratory in biology in. Cen structure and Function	Z
BIOL	24100	Biology IV: Genetics and Molecular Biology	3
BIOL	24200	Laboratory in biology IV: Genetics and Molecular Biology	2
BIOL	28600	Introduction to Ecology and Evolution	2
Organic C	hemistry (a	ll required)	
CHM	25500	Organic Chemistry I	3
CHM	25501	Organic Chemistry I Laboratory	1
CHM	25600	Organic Chemistry II	3
CHM	25601	Organic Chemistry II Laboratory	1
Select one	2		
BIOL	13500	First Year Biology Laboratory <b>OR</b>	2
ABE	22600	Biotechnology Laboratory I <b>OR</b>	2
BIOL	19500	Special Assignments	0-18

## **Biology Selectives**

Select ten (10) hours of upper division biology courses. They must include the following:

<sup>•</sup> One Intermediate Biology Selective

<sup>.</sup> At least one Group A selective

<sup>.</sup> At least one Group B selective

<sup>•</sup> Satisfy the Base Laboratory Requirement: one option from the required list, satisfy Objective A, satisfy Objective B

<sup>•</sup> At least one 50000-level course from Group A or Group B

<sup>•</sup> Research (49400 or 499000 maximum 2 credits), BIOL 36701, and BIOL 44100 will count toward the 10 credit requirement, but will not satisfy the Group A or Group B or Laboratory requirement

<sup>•</sup> Overlap (Intermediate Selective, Group A, Group B, 500, Lab) is allowed, but 10 credits must still be earned.

<sup>•</sup> Please use the footnotes to determine which classes meet which requirements. Some courses will meet multiple requirements.

BIOL	32800	Principles of Physiology <sup>1,3,4</sup>	4
BIOL	36700	Principles of Development <sup>1,3</sup>	2
BIOL	39500	Special Assignments <sup>1,2,5,6</sup>	0-18
BIOL	41500	Introduction to Molecular Biology <sup>1,2,3</sup>	3
BIOL	41600	Viruses and Viral Disease <sup>1,2</sup>	3
BIOL	42000	Eukaryotic Cell Biology <sup>1,2</sup>	3
BIOL	43600	Neurobiology <sup>1,2</sup>	3
BIOL	43800	General Microbiology <sup>1,2</sup>	3
BIOL	43900	Laboratory in General Microbiology <sup>2,4,5,6</sup>	2
BIOL	44212	Microscopy and Cell Biology 4,6	1
BIOL	44600	Molecular Bacterial Pathogenesis <sup>2</sup>	3
BIOL	47800	Introduction to Bioinformatics <sup>2</sup>	3
BIOL	48100	Eukaryotic Genetics <sup>2</sup>	3
BIOL	48300	Great Issues: Environmental and Conservation Biology <sup>3,5,6</sup>	3
BIOL	49500	Special Assignments <sup>2,3,4,5,6</sup>	0-18
BIOL	51600	Molecular Biology of Cancer <sup>2</sup>	3

BIOL	51700	Molecular Biology: Proteins <sup>2</sup>	2
BIOL	52900	Bacterial Physiology <sup>2</sup>	3
BIOL	53300	Medical Microbiology <sup>2</sup>	3
BIOL	53601	Biological and Structural Aspects of Drug Design and Action <sup>2</sup>	3
BIOL	53700	Immunobiology <sup>3</sup>	3
BIOL	53800	Molecular, Cellular, and Developmental Neurobiology <sup>2</sup>	3
BIOL	54100	Molecular Genetics of Bacteria <sup>2</sup>	3
BIOL	54200	Modular Upper-Division Laboratory Course 4,6	1-2
BIOL	54900	Microbial Ecology <sup>2</sup>	2
BIOL	55001	Eukaryotic Molecular Biology <sup>2</sup>	4
BIOL	56200	Neural Systems <sup>2</sup>	3
BIOL	56310	Protein Bioinformatics <sup>2</sup>	3
BIOL	58000	Evolution <sup>3</sup>	3
BIOL	58210	Ecological Statistics <sup>3,5,6</sup>	3
BIOL	58705	Animal Communication <sup>3</sup>	3
BIOL	59100	Field Ecology <sup>3,4,5,6</sup>	4
BIOL	59200	The Evolution of Behavior <sup>3</sup>	3
BIOL	59500	Special Assignments <sup>2,4,5,6</sup>	0-18
BCHM	43400	Medical Topics in Biochemistry <sup>2</sup>	3
BCHM	56100	General Biochemistry I <sup>2</sup>	3
BCHM	56200	General Biochemistry II <sup>2</sup>	3
CHM	33900	Biochemistry: A Molecular Approach <sup>2</sup>	3
CHM	43300	Biochemistry <sup>2</sup>	3
HORT	30100	Plant Physiology <sup>3</sup>	4
	<sup>1</sup> Intermed	diate Biology Requirement	
	<sup>2</sup> Group A		
	<sup>3</sup> Group B		
	<sup>4</sup> Base Lab	Required	

- <sup>5</sup> Base Lab Objective A
- <sup>6</sup> Base Lab Objective B

#### **Credit Hours Professional Education** 43-54 All Professional Education courses, including University Concentration courses, are calculated into the Professional Education GPA ("B" average with no grade lower than a "C"). Required for TEP Admission Exploring Teaching as a Career EDCI 20500 2 Multiculturalism and Teaching 2 EDCI 28500 EDST 20010 **Educational Policies and Laws** 1 Core Courses

EDCI/EDPS	20001	Special Populations Seminar: Focus On Students with Disabilities and	1
		Differentiation Approaches	

EDCI/EDPS	20002	Special Populations Seminar: English Language Learners and Students with Gifts and Talents		1
EDCI	27000	Introduction to Educational Technology and Computing		1
EDCI	30900	Reading in the Middle and Secondary Schools: Methods and Problems		1-3
EDCI	35000	Community Issues & Applications for Educators		1-3
EDCI	37001	Teaching and Learning English as a New Language		2-3
EDPS	23500	Learning and Motivation		2-3
EDPS	24000	Children with Gifts, Creativity, and Talents		1
EDPS	24800	Differentiating Curriculum and Instruction		1
EDPS	26501	The Inclusive Classroom		2
EDPS	32700	Classroom Assessment		1-3
EDPS	36201	Positive Behavioral Supports		2-3
EDPS	43010	Secondary Creating and Managing Learning Environments		2-3
<u>Methods Co</u>	<u>urses</u>			
EDCI	42100	The Teaching of Biology in Secondary Schools		3
Select One				
EDCI	42800	Teaching Science in the Middle and Junior High School <b>OR</b>		2
EDCI	55800	Integrated Science, Technology, Engineering, and Mathematics (STEM)		
		Educations Methods-Secondary		3
Student Tea Completion and admitta	<u>ching</u> of educatio Ince to tead	on methods courses and other Milestone requirements for the major area cher education required prior to this course.		
EDCI	49800	Supervised Teaching		12
<u>University</u> C	oncentratio	ons		
Choose one Students car but it is not	course fror n elect to to required.	n the concentrations below that was not already taken as a required course. ake additional coursework to complete a full concentration if they choose,		
Enalish Land	iuaae Leari	ners (Licensure Eligible)	12-13	
EDCI	37001	Teaching and Learning English as a New Language		2-3
EDCI	51900	Teaching Enlish Language Learners		3
EDCI	52600	Language Study for Educators		3
EDCI	55900	Academic Langague and Content Area Learning		3
EDCI/ EDPS	20002	Special Pop Sem: English Lang Learners and Students with Gifts <b>OR</b> Special		1
		Pop Sem: English Lang Learners and Students with Gifts		
High Ability	(Licensure	Eligible)	13-15	
All courses r	nust be cor	npleted with a B- or better average		
EDCI/ EDPS	20001	Special Pop Sem: Focus on Students with Disabilities and Differentiation <b>OR</b> Special Pop Sem: Focus on Students with Disabilities and Differentiation		1
EDCI/ EDPS	20002	Special Pop Sem: English Lang Learners and Students with Gifts <b>OR</b> Special		1
EDPS	24800	Differentiating Corriculum and Instruction		1

EDPS	49500	Practicum in Gifted, Creative, and Talented Education		3
EDPS	54200	Curriculum and Program Development in Gifted Education		3
EDPS	54500	Social and Affective Development of Gifted Students		3
Select one				
EDPS	24000	Children with Gifts, Creativity, and Talents <b>OR</b>		1
EDPS	54000	Gifted, Creative, and Talented Children		3
Special Educ	ation (Non	-Licensure)	12-13	
EDCI/ EDPS	20001	Special Pop Sem: Focus on Students with Disabilities and Differentiation <b>OR</b> Special Pop Sem: Focus on Students with Disabilities and Differentiation		1
EDCI/ EDPS	20002	Special Pop Sem: English Lang Learners and Students with Gifts <b>OR</b> Special Pop Sem: English Lang Learners and Students with Gifts		1
EDPS	21100	Special Edcation Law, Policy, and Ethical Guidelines		3
EDPS	26501	The Inclusive Classroom		2
EDPS	36201	Positive Behavioral Supports		2-3
EDPS	41700	Special Education Knowledge and Skills for General Educators		3
Applied Beh	avioral And	ılysis (Non-Licensure)	12	
EDPS	34100	Introduction to Philosophical Underpinningd and Concepts of Behavior		3
EDPS	34200	Applied Behavior Analysis - Assessment and Intervention		3
EDPS	44100	Introduction to Ethics and Practice of Applied Behavior Analysis		3
EDPS	44200	Advanced Intervention in Applied Behavior Analysis		3
EDPS	44200	Advanced Intervention in Applied Behavior Analysis		3

## **Licensure Information**

All Purdue University Program and Indiana Department of Education requirements must be met for recommendation for Indiana licensure.

After all requirements are met, Purdue graduates will be considered eligible to apply to the Indiana Department of Education for licensure under REPA 3 in:

## Life Science (5-12)

## Addition in Blended and Online Teaching (5-12) Optional: Addition in High AbilityEducation (P-12) or Teachers of English Learners (P-12) if chosen university concentration requirements are complete

<u>Visit the Indiana Department of Education website for more information about what courses can be taught</u> <u>once licensed in this area.</u>

Please reference the 2023-2024 Biology Education Guidelines and Requirements and the 2023-2024 Biology Education Checklist for more information.