



— Teach —  
I N D I A N A

# Program Catalog 2020 - 2021

Graduate Courses

Undergraduate Courses

Conferences

Workshops

# Welcome from the Program Director

Dear Indiana K-12 Educators,

STEM Teach is pleased that you are interested in participating in professional development opportunities for science, technology, engineering and math designed specifically for classroom teachers. As a current K-12 in-service teacher in Indiana, you are eligible to participate in STEM Teach offerings at no cost to you.

In this program guide, you will find descriptions of all of the offerings tentatively planned for six semesters to include Spring 2020 through Summer 2021, as well as the necessary information of how to apply, register and participate in STEM Teach.

## What is STEM Teach?

STEM Teach is a partnership of CELL (Center of Excellence in Leadership of Learning) and ICI (Independent Colleges of Indiana) and has been awarded a fourth round of funding from the Indiana Commission for Higher Education through the state of Indiana. The primary focus of STEM Teach is to increase the number of dual-credit teachers in STEM fields, as well as provide learning opportunities to boost STEM instruction in grades K through 12.

STEM Teach offerings are from various independent and public higher education institutions at NO COST to schools or teachers. These offerings include:

- Graduate and undergraduate courses in content areas such as biology, chemistry, mathematics, physics, environmental science, psychology, agriculture, computer science and technology
- Regional workshops from higher education institutions designed specifically for K-12 teachers to enhance STEM instruction
- Scholarships to STEM-related educational conferences in Indiana

We hope that you find the offerings included in STEM Teach to be challenging, successful and rewarding experiences that will assist you with providing a high-quality STEM education to Hoosier students.

Please feel free to reach out to me with questions, or visit our website regularly for more information at [www.stemteachindiana.org](http://www.stemteachindiana.org).

Sincerely,



Director of Strategic Initiatives

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STEM Teach IV is a project of the Independent Colleges of Indiana (ICI) in partnership with the Center of Excellence in Leadership of Learning (CELL) at the University of Indianapolis. Through a state grant, it brings together a group of ICI member colleges and public institutions to offer STEM courses and workshops for in-service K-12 teachers in Indiana.

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# Getting Started

Note: This is a working document and will change as course or workshop information is updated.

## Applying to the Program

STEM Teach IV accepts applications from teachers who are interested in taking graduate or undergraduate classes, workshops or receiving scholarships to attend conferences. "Applying" to STEM Teach simply means teachers create an account in order to verify teaching status and allow permission to receive notifications regarding application and registration windows or future offerings. An account is required to access the STEM Teach online teacher portal and register for offerings.

The application must be completed in one sitting. It takes approximately 10 minutes to complete the application.

Steps to apply include:

1. Locate teaching license number and school administrator contact information.

*Attention dual credit teachers:* Please note that a letter from a school administrator must be included with an application and it must acknowledge the following:

- Teacher is applying to take courses, workshops, or attend conferences through STEM Teach IV
  - Statement of need indicating that the teacher needs to complete courses in "specified" content area for the school to continue offering dual credit courses (to students) OR statement of need indicating that teacher needs to complete courses in "specified" content area for the school to offer dual credit courses in the future (to students)
  - Name, title, and signature of administrator on school or district letterhead
2. Create an account in the online teacher portal <https://stemteach.azurewebsites.net/>
  3. Watch for an email from STEM Teach IV within a few weeks of the application. If the application was approved, instructions will be provided for registration based on priority status (dual credit teachers have

designated priority registration windows). For more detailed information about the application process visit the STEM Teach website at [www.stemteachindiana.org](http://www.stemteachindiana.org).

## Registering for Offerings

The online course catalog will be available during each registration window. Detailed course information is released prior to each semester via the course catalog on the STEM Teach website. Teachers should review course syllabi and workshop learning outcomes posted online prior to registering for each offering.

After reviewing the course offerings, teachers may log into the STEM Teach portal and register for courses, workshops, or conference scholarships during a registration window. Teachers may register for one course **and** one conference **OR** workshop per semester.

STEM Teach IV Timeline

Semester	STEM Teach Term	Offering Window
Spring 2020	Semester 1	January - May
Summer I & II	Semester 2 & 3	May - August
Fall 2020	Semester 4	September - December
Spring 2021	Semester 5	January - May
Summer I 2021	Semester 6	May - July
Summer II 2021 (If funds allow)	Semester 7	June - August

## Preparing for Offerings

After teachers register for an offering, they will receive a confirmation email from STEM Teach verifying the registration. Once the registration window closes for a semester, STEM Teach will send registration lists to the higher education institution offering the course or workshop. A few weeks prior to the start of the class or workshop, the higher education institution will reach out to registrants to request any additional necessary information as well as provide directions for accessing the course or workshop.

Each higher education institution is responsible for providing textbooks or

materials to each participant for each offering. Some of these textbooks or materials are rentals and must be returned per the institution's instructions while others may be kept by the participant. Participants should work with the representative at the college or university to understand the materials or textbook policy for each offering.

## Using the Program Catalog

This catalog is provided as a tool for teachers to view brief descriptions of offerings and plan out the courses, workshops or conference scholarship opportunities that they would like to participate in from Spring 2020 through Summer I 2021. Full course and workshop descriptions will be available in the online course catalog and through the teacher portal when registration opens for each semester.

It is important to note that as registration concludes for each semester, it may be necessary to cancel offerings due to low enrollment numbers or changes at the higher education institution providing the offering.

## Accessing my Account

After teachers are accepted in to the STEM Teach program, they may access their account through the STEM Teach portal at any time by logging in at <https://stemteach.azurewebsites.net/>

## Updating or Changing Contact Information

If a participant's contact information has changed, participants may update information such as school and corporation name and address, home address, phone number, etc.

- Click on Students and drag down to Profile. Your editable profile information will be displayed with a white background.
- Any changes to fields with a gray background (email address or name) need to be submitted to STEM Teach via email.
- Enter the updated information in the available fields. Be sure to check that gender, race, and all other applicable school and home information is correct.
- To save changes, click on Submit at the bottom of the page. (A temporary pop-up will appear at the bottom of the screen indicating that your information is now saved.)

- To sign out, click on Log Off using the person icon in the top right corner of the screen.

## Viewing Class History

To view classes, Click on Classes from the Students menu to view registration or drops for each class/semester.

## Staying Informed

STEM Teach IV will send out updates via email from time to time. Visit the homepage of the website to sign up for updates. [www.stemteachindiana.org](http://www.stemteachindiana.org)

## Providing Feedback on an Offering

After teachers complete a course or workshop, they are invited via email to complete a survey. The survey is an invitation to provide anonymous feedback to STEM Teach regarding the overall program the higher education institution offering the course regarding the course and instructor.

## Hearing from Previous Participants

STEM Teach asked previous participants what they would tell fellow teachers about the program. Some of the responses are included below:

*"I would tell them it is a great program and very straight-forward and easy to follow. I've never had any issues and the questions I've had get answered very quickly. I would encourage them to enroll as this is a great opportunity to have graduate level classes for free as well as still provide the dual credit opportunity to the high school students they teach."*

*"It is a solid program and good opportunity to get teachers up to par for HLC requirements without asking of them anything more than time and dedication to their field."*

*"Enroll and embrace the challenge. Teachers need to understand that it is not going to be easy but enjoy the struggles and successes."*

*"The program is wonderful, I like the online aspect so that I can work on my own pace."*



# Program Guidelines

## Cancellation of Offerings

Minimum enrollments are needed for each offering. After registration is completed, STEM Teach will determine if there are enough registrants for each offering. In the event there are not enough teachers enrolled in an offering, STEM Teach will notify teachers of any cancellations for which they were registered.

## Dropping an Offering

Teachers should give thoughtful consideration to registration and enrollment in this grant-funded opportunity. If a teacher is unable to complete a course or workshop, another teacher will have missed out on the opportunity to participate.

If a teacher needs to drop/withdraw from the course or workshop for emergency reasons, inform the instructor **and** STEM Teach IV as soon as possible. The instructor will inform the teacher if he/she needs to go through the institution's drop process.

If a teacher does not successfully complete the offering or withdraws from STEM Teach IV offerings, they may not have the opportunity to register for future courses or offerings through STEM Teach.

## HLC Policies for Dual Credit Teachers

STEM Teach offers graduate courses to in-service teachers to complete the requirements from the Higher Learning Commission (HLC) for teaching dual credit courses. The HLC requires that all dual credit teachers have a master's degree in the specific content area in which they teach a dual credit course or a master's degree plus 18 graduate credit hours in the specific content area. For more information visit the HLC website at [http://download.hlcommission.org/FacultyGuidelines\\_2016\\_OPB.pdf](http://download.hlcommission.org/FacultyGuidelines_2016_OPB.pdf). Teachers must work with their school's primary dual credit provider prior to registering for a course to ensure that a course will count towards credentialing.

## Frequently Asked Questions

HOW DO I BECOME ELIGIBLE TO PARTICIPATE IN STEM TEACH IV?

In order to be eligible for STEM Teach IV, teachers must apply via an online application to participate in this grant-funded opportunity.

WHO IS ELIGIBLE FOR COURSES, WORKSHOPS AND CONFERENCE SCHOLARSHIPS?

All applicants must be currently teaching in an Indiana school and may be required to submit a letter of verification from a school administrator.

MAY TEACHERS ENROLL DIRECTLY INTO COURSES OR WORKSHOPS AT ANY INSTITUTION THAT IS PARTICIPATING IN STEM TEACH?

No. Teachers must register for courses through the STEM Teach teacher portal to be eligible for this grant-funded opportunity.

WILL TEACHERS RECEIVE A DEGREE OR CERTIFICATE FROM STEM TEACH?

STEM Teach IV does not provide degrees or certificates; it provides opportunities to take graduate and undergraduate level courses as well as workshops at participating higher education institutions that may count toward degrees or certificates.

ARE THERE FEES OR CHARGES ASSOCIATED WITH TAKING STEM TEACH IV COURSES OR WORKSHOPS?

Tuition and book/materials fees are at no cost to eligible teachers who participate in STEM Teach IV.

HOW DO I PROVIDE FEEDBACK ON A COMPLETED COURSE OR WORKSHOP?

After completion, each teacher will receive an email with a link to a survey for feedback about the program, course, instructor, etc. Participation in surveys is strongly encouraged to continue improving the STEM Teach program.

# Spring 2020 Graduate Courses

## BIO 504 Genetics

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Integrates basic principles of genetics in eukaryotes and prokaryotes at the level of molecules, cells, and multi-cellular organisms including humans; also covered are Mendelian genetics, the molecular basis of gene function and mutation, transmission systems, population, and evolutionary genetics

Related Offerings:

BIO 504 Genetics (Spring 2020)

BIO 501 Biological Chemistry (Summer I 2020)

BIO 505 Human Physiology (Summer II 2020)

BIO 502 Cell Biology (Fall 2020)

BIO 503 Systems Biology (Late Fall 2020)

BIO 506 Microbiology (Spring 2021)

## BIO 587 Bioinformatics

**Indiana State University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Fundamental review of the cellular and biomolecular basis of inheritance using a genome-scale perspective; description of emerging genomics technologies and techniques, basic bioinformatics methods and tool applications within the domains of medicine and biology

Related Offerings:

BIO 587 Bioinformatics (Spring 2020)

BIO 633 Adv Pathophysiology (Summer I 2020)

## CHEM T 520 Organic Synthesis

**Indiana University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Major topics and themes in organic synthesis, stereoselective synthesis, medicinal chemistry, biosynthesis, bioinspired (or biomimetic) synthesis and polymer synthesis

Related Offerings:

CHEM T 520 Organic Synthesis (Spring 2020)

CHEM T 590 Chemistry Capstone (Summer I 2020)

Additional chemistry courses to be determined

## IT 502 Introduction to Programming

### **Valparaiso University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: Basic understanding of College Algebra

Topics: Introduction to programming (assumes no previous experience)

Sequential Offerings:

IT 502 Introduction to Programming (Spring 2020)

IT 510 Introduction to IT (Summer I 2020)

IT 533 Data Mining (Summer II 2020)

IT 632 Instructional Design in IT (Summer II 2020)

IT 600 Ethics in Information Technology (Fall 2020)

IT 560 Mobile Computing (Spring 2021)

IT 540 Web Programming (Summer I 2021)

## Math 502 Abstract Algebra

### **Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Study of algebraic structures and major theorems, group theory and ring theory, field theory, and Galois theory

Related Offerings:

Math 502 Abstract Algebra (Spring 2020)

Math 504 Real Analysis (Summer I 2020)

Math 501 Linear Algebra (Summer II 2020)

Math 505 Statistical Methods (Fall 2020)

Math 506 Modern Geometry (Late Fall 2020)

Math 503 Advanced Calculus (Spring 2021)

## Math 511 Theory of Numbers

### **Indiana State University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: MATH 320 with a C or better

Topics: Distribution of primes, divisibility, modular arithmetic, quadratic reciprocity, arithmetic functions and applications on Cryptography

Related Offerings:

Math 511 Theory of Numbers (Spring 2020)

Math 604 Euclidean Concepts of Geometry (Summer I 2020)

Math 541 Probability (Fall 2020)

Math 542 Mathematical Statistics (Spring 2021)

Math 512 Abstract Algebra (Summer I 2021)



# PHYS 501 Mathematical Methods in Physics

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Develops a mathematical foundation to succeed in graduate level courses in classical mechanics, electrodynamics, thermodynamics/statistical physics, and modern and quantum physics

Sequential Offerings:

Physics 501 Mathematical Methods in Physics (Spring 2020)

Physics 502 Classical Mechanics (Summer I 2020)

Physics 503 Electromagnetism (Summer II 2020)

Physics 504 Intro to Quantum Mechanics (Fall 2020)

Physics 505 Quantum Mechanics II (Spring 2021)

Physics 506 Thermodynamics and Statistical Mechanics (Summer 2021)

# Spring 2020

# Undergraduate Courses

## CS 151 Intro to Computer Science

**Indiana State University**

Undergraduate Credit Hours: 3

Format: Online

Teacher Level: Grade K-12

Prerequisite:

Topics: Explores core concepts that are foundational in computer science – including programming, use of computers for dealing with files and programs, how data is stored and number systems

Related Offerings:

ITSC 122 Computer Programming II (Python) (Summer I 2020)

CS 101 Fundamentals of Computing (Spring 2021)

## ITSC 121 Computer Programming I – Python

**Bethel University**

Format: Online

Undergraduate Credit Hours: 3

Teacher Level: Grade K-12

Prerequisite: College Algebra

Topics: Introduction to computer application development using a high-level, object oriented, GUI based language – Python; problem solving methods, algorithms, controls structures, documentation, and debugging

Related Offerings:

ITSC 122 Computer Programming II (Python) (Summer I 2020)

CS 101 Fundamentals of Computing (Spring 2021)

# Spring 2020

## Conferences, Raffles, & Workshops

### **Conferences**

#### HASTI Conference

The 49th Annual HASTI Conference, February 9 – 11, 2020, at the Wyndham – Indianapolis West offers approximately 130 sessions spanning three days along with an Exhibit Hall featuring leaders in the STEM industry.

#### Purdue STEM Conference

The fifth-annual Indiana STEM Education Conference, January 15, 2020, at Purdue University in West Lafayette, Indiana addressed the STEM education needs of K-12 teachers and schools.

# Summer I 2020 Graduate Courses

## BIO 501 Biological Chemistry

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: A bachelor's degree with a Biology major or must be state certified (in any state) to teach Biology at a secondary school level. Undergraduate coursework must include a "C" level or higher in Introductory Biology, Introductory Biology Lab, General Chemistry, and General Chemistry Lab.

Topics: Provides an intermediate understanding of chemical principles in biology and focuses on the study of proteins, carbohydrates, lipids, and nucleic acids in a biological context; enzymes, metabolism, and gene expression are also investigated

Related Offerings:

BIO 504 Genetics (Spring 2020)

BIO 501 Biological Chemistry (Summer I 2020)

BIO 505 Human Physiology (Summer II 2020)

BIO 502 Cell Biology (Fall 2020)

BIO 503 Systems Biology (Late Fall 2020)

BIO 506 Microbiology (Spring 2021)

## CHEM T 590 Chemistry Capstone

**Indiana University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: 9 graduate hours already completed in chemistry

Topics: An integration of knowledge and understanding from the literature that transcends subdisciplinary boundaries of chemistry

Related Offerings:

CHEM T 520 Organic Synthesis (Spring 2020)

CHEM-T 530 Organic Spectroscopy

CHEM-T 540 Physical Chemistry

CHEM T 590 Chemistry Capstone (Summer I 2020)

CHEM 510 Inorganic Chemistry (Spring 2021)

## IT 510 Introduction to IT

### **Valparaiso University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: Reviews the academic discipline of IT, including pervasive IT themes, IT history, organizational issues, and relationship of IT to other computing disciplines; also includes practicum to illustrate the nature of platforms and technologies currently employed in industry

Sequential Offerings:

IT 502 Introduction to Programming (Spring 2020)

IT 510 Introduction to IT (Summer I 2020)

IT 533 Data Mining (Summer II 2020)

IT 632 Instructional Design in IT (Summer II 2020)

IT 600 Ethics in Information Technology (Fall 2020)

IT 560 Mobile Computing (Spring 2021)

IT 540 Web Programming (Summer I 2021)

## Math 504 Real Analysis

### **Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: Undergraduate Real Analysis

Topics: A rigorous study of the real numbers and associated functions in order to deepen students' understanding of calculus and raise their ability to effectively formulate and communicate mathematics

Related Offerings:

Math 502 Abstract Algebra (Spring 2020)

Math 504 Real Analysis (Summer I 2020)

Math 501 Linear Algebra (Summer II 2020)

Math 505 Statistical Methods (Fall 2020)

Math 506 Modern Geometry (Late Fall 2020)

Math 503 Advanced Calculus (Spring 2021)

## Math 604 Advanced Euclidean Geometry

### **Indiana State University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: It is highly suggested that students have taken an undergraduate course in geometry

Topics: Includes advanced topics in geometry and explores topics in Euclidean geometry (including transformations), Ceva's theorem, Menelaus' theorem and related topics

Related Offerings:

Math 511 Theory of Numbers (Spring 2020)

Math 604 Euclidean Concepts of Geometry (Summer I 2020)

Math 541 Probability (Fall 2020)

Math 542 Mathematical Statistics (Spring 2021)

Math 512 Abstract Algebra (Summer I 2021)



# PHYS 502 Classical Mechanics

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: Physics 501 Mathematical Methods in Physics or equivalent

Topics: Focuses on Newtonian (non-relativistic) mechanics and its Lagrangian formulation with applications to the motions of particles in three dimensions, systems of particles, gravitation and orbits, rigid body rotations and small vibrations

Sequential Offerings:

Physics 501 Mathematical Methods in Physics (Spring 2020)

Physics 502 Classical Mechanics (Summer I 2020)

Physics 503 Electromagnetism (Summer II 2020)

Physics 504 Intro to Quantum Mechanics (Fall 2020)

Physics 505 Quantum Mechanics II (Spring 2021)

Physics 506 Thermodynamics and Statistical Mechanics (Summer 2021)

# Summer I 2020

## Undergraduate Courses

### ITSC 122 Computer Programming II – Python

**Bethel University**

Undergraduate Credit Hours: 3

Format: Online

Teacher Level: Grade K-12

Prerequisite: ITSC121 Programming I (Python)

Topics: A continuation of ITSC 121 with emphasis on creating classes, data integration and data structures, web programming and exception handling

Related Offerings:

CS 151 Intro to Computer Science (Spring 2020)

ITSC 121 Computer Programming I (Python) (Spring 2020)

CS 101 Fundamentals of Computing (Spring 2021)

# Summer I 2020

## Conferences, Raffles, & Workshops

### **Conferences** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

TBD

### **Raffle** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

#### **Bristlebot Classroom Kits**

Format: Online Promotion from STEM Teach

Description: In place of conference scholarships during this period, STEM Teach will be raffling off classroom kits for teachers to use when they return to the classroom. Check out the Bristlebot kit which will be featured in the upcoming registration window. <https://browndoggadgets.dozuki.com/Guide/Bristlebot/2?lang=en>

Eligibility: Grade 4-7 Teachers (Future promotions will target other grades)

### **Workshops** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for specific days and times)

#### ***BETHEL UNIVERSITY, MISHAWAKA, IN, ST. JOSEPH COUNTY***

##### **CS Bootcamp for K-5 Teachers**

Format: Online

Description: Prepares elementary teachers to incorporate the Indiana Computer Science Standards into their curriculum to include digital citizenship, data representation, programming, and sorting and searching

PGP Points: 6 Hours

Teacher Level: Grade K-5

##### **Implementing 1-1 Technology**

Format: Online

Description: Designed to help elementary and middle school teachers with effective implementation of 1-1 technology

PGP Points: 6 Hours

Teacher Level: Grade K-8

## **HUNTINGTON UNIVERSITY, HUNTINGTON, IN, HUNTINGTON COUNTY**

### Introduction to Web Development

Format: Online

Description: Introduces web development using HTML and CSS; no prior coding experience needed

PGP Points: 6 Hours

Teacher Level: Grade 6-12

### Teaching Visualization of STEM topics with RStudio

Format: Online

Description: Participants will learn how to use R (a powerful and free software package) to enhance mathematics teaching

PGP Points: 6 Hours

Teacher Level: Grade 9-12

## **INDIANA STATE UNIVERSITY, TERRE HAUTE, IN, VIGO COUNTY**

### Teaching Programming Intro

Format: Online

Description: Builds basic programming skills which are needed in teaching different computing courses in high school; builds skills in developing assignments and assessing student work

PGP Points: 6 Hours

Teacher Level: Grade 6-12

## **INDIANA WESLEYAN UNIVERSITY, MARION, IN, GRANT COUNTY**

### A Field Trip to the Particle Zoo

Format: Online

Description: So, what do you say when your son or daughter asks you about quarks because it was on the ACT exam? Can you follow superheros in a Marvel movie as they discuss the quantum realm or multiverse? When an image of a black hole shows up on your social media feed, will you be able to converse about it confidently? If not, this workshop is for you and anyone else who would like to catch up on some basic and more recent aspects of physics. By the end of the session, you will be able to discuss physics concepts with your kids, colleagues, or social media buddies with scientific confidence. Taught by an education professor experienced in teaching science to elementary teacher candidates.

PGP Points: 6 Hours

Teacher Level: K-12

## **UNIVERSITY OF INDIANAPOLIS, INDIANAPOLIS, IN, MARION COUNTY**

### Crafting, Coding and Circuitry

Format: Online

Description: Focuses on the utilization of a maker space within a formal learning environment such as a school, library or museum to promote problem-solving, self-directed learning and collaborative work

PGP Points: 20 Hours

Teacher Level: Grade K-5

## Making the Elementary Math Classroom Come Alive with PBL

Format: Online

Description: Supports elementary teachers in designing project-based learning units to deeply engage students in elementary mathematics

PGP Points: 30 Hours

Teacher Level: Grade K-5

## Making the Secondary Mathematics Classroom Come Alive with PBL

Format: Online

Description: Supports secondary mathematics teachers in designing project-based learning units to deeply engage their students in secondary mathematics; explore the nuts and bolts of designing an effective PBL unit, while ensuring the Indiana Mathematical Process Standards are the cornerstones to the unit

PGP Points: 30 Hours

Teacher Level: Grade 6-12



# Summer II 2020 Graduate Courses

## BIO 505 Human Physiology

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: Utilizes a systems approach in the exploration of the concept of homeostasis, or the ability of the body systems to work together to maintain internal stability

Related Offerings:

BIO 504 Genetics (Spring 2020)

BIO 501 Biological Chemistry (Summer I 2020)

BIO 505 Human Physiology (Summer II 2020)

BIO 502 Cell Biology (Fall 2020)

BIO 503 Systems Biology (Late Fall 2020)

BIO 506 Microbiology (Spring 2021)

## BIO 556 Human Evolution

**University of Indianapolis**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: A broad study of aspects of human evolution, including evolutionary theory, fossil and archeological evidence, aspects of comparative anatomy, behavior, and ecology, and the genetics and variation of modern human populations in order to reconstruct the biological and cultural prehistory of our species. This course is taught in the context of more general biological principles and teaching standards.

Related Offerings:

None

## IT 533 Data Mining

**Valparaiso University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: IT-502 Introduction to Programming

Topics: Provides a wide exposition of data mining techniques from several fields including machine learning, statistics, pattern recognition, artificial intelligence, and database systems

Sequential Offerings:

IT 502 Introduction to Programming (Spring 2020)

IT 510 Introduction to IT (Summer I 2020)

IT 533 Data Mining (Summer II 2020)

IT 632 Instructional Design in IT (Summer II 2020)

IT 600 Ethics in Information Technology (Fall 2020)

IT 560 Mobile Computing (Spring 2021)

IT 540 Web Programming (Summer I 2021)

## IT 632 Instructional Design in IT

### **Valparaiso University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: IT-502 Introduction to Programming

Topics: Provides discussion and hands-on application of instructional design methodology; students will work individually and in teams to apply instructional design concepts to real-world situations in order to gain experience with designing instruction

Sequential Offerings:

IT 502 Introduction to Programming (Spring 2020)

IT 510 Introduction to IT (Summer I 2020)

IT 533 Data Mining (Summer II 2020)

IT 632 Instructional Design in IT (Summer II 2020)

IT 600 Ethics in Information Technology (Fall 2020)

IT 560 Mobile Computing (Spring 2021)

IT 540 Web Programming (Summer I 2021)

## Math 501 Linear Algebra

### **Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: Undergraduate Linear Algebra

Topics: Intermediate treatment of the theory and application of linear algebra; vector spaces, linear transformations, diagonalization, inner product spaces, Markov Chains, and canonical forms

Related Offerings:

Math 502 Abstract Algebra (Spring 2020)

Math 504 Real Analysis (Summer I 2020)

Math 501 Linear Algebra (Summer II 2020)

Math 505 Statistical Methods (Fall 2020)

Math 506 Modern Geometry (Late Fall 2020)

Math 503 Advanced Calculus (Spring 2021)

## Math 590 Statistics for Decision Making

### **Valparaiso University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Content includes analysis of variance, simple and multiple regression, correlation, timeseries analysis, and nonparametric methods.

Related Offerings: None

## PHYS 503 Electromagnetism

### **Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: Physics 501 Mathematical Methods in Physics

Topics: Focuses on the development and application of the integral and differential forms of Maxwell's equations from phenomenological observations, culminating in the electromagnetic wave equations; discusses potential theory, static and dynamic electromagnetic field equations in vacuum and media, and electromagnetic waves with select applications

Sequential Offerings:

Physics 501 Mathematical Methods in Physics (Spring 2020)

Physics 502 Classical Mechanics (Summer I 2020)

Physics 503 Electromagnetism (Summer II 2020)

Physics 504 Intro to Quantum Mechanics (Fall 2020)

Physics 505 Quantum Mechanics II (Spring 2021)

Physics 506 Thermodynamics and Statistical Mechanics (Summer 2021)

## PSY 506 Social Psychology

### **University of St. Francis**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: General principles of social psychology, including socialization of the individual, attitude formation, conformity, group identification, and group dynamics

Related Offerings:

PSY 506 Social Psychology (Summer II 2020)

PSY 512 Theories of Personality (Fall 2020)

PSY 518 Cognitive Neuroscience (Spring 2021)

PSY 515 Abnormal Psychology (Summer I 2021)

# Summer II 2020

## Undergraduate Courses

### BIO 274 Intro Microbiology & BIO 274L Intro Microbiology Lab

#### **Indiana State University**

Undergraduate Credit Hours: 3

Format: Online

Teacher Level: Grade K-12

Prerequisite: Completion of college level introductory chemistry class

Topics: The basic characteristics of fungi, algae, bacteria, and viruses; special emphasis is placed on topics and applications that relate to humans

Related Offerings:

BIO 251 Bioethics (Fall 2020)

# Summer II 2020

## Conferences, Raffles, & Workshops

### **Conferences** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

TBD

### **Raffle** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

#### Arduino Kits

Format: Online Promotion from STEM Teach

Description: In place of conference scholarships during this period, STEM Teach will be raffling off classroom kits for teachers to use when they return to the classroom. Check out the Arduino kit which will be featured in the Summer II registration window. [https://1stmakerspace.com/products/arduino?\\_pos=1&\\_sid=e48b68bcc&\\_ss=r](https://1stmakerspace.com/products/arduino?_pos=1&_sid=e48b68bcc&_ss=r)

### **Workshops** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for specific days and times)

#### **HUNTINGTON UNIVERSITY, HUNTINGTON, IN, HUNTINGTON COUNTY**

##### Process Standards in Calculus

Format: Online

Description: Participants will learn to identify opportunities to emphasize the Indiana Process Standards when teaching introductory calculus, including the use of technological tools

PGP Points: 6 Hours

Teacher Level: Grade 9-12



# Fall 2020

# Graduate Courses

## BIO 502 Cell Biology

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: Develops a deeper insight into the complexities of cell structure, function, and cellular processes with a focus on biosynthesis, cell signaling, regulation of proteins, and cell cycle/apoptosis

Related Offerings:

BIO 504 Genetics (Spring 2020)

BIO 501 Biological Chemistry (Summer I 2020)

BIO 505 Human Physiology (Summer II 2020)

BIO 502 Cell Biology (Fall 2020)

BIO 503 Systems Biology (Late Fall 2020)

BIO 506 Microbiology (Spring 2021)

## BIO 503 Systems Biology

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: Investigates the major principles and concepts of biological systems, including the fundamentals of mathematical and physiological modeling, a detailed analysis of gene, protein, and metabolic systems, as well as the application of systems biology in health and medicine

Related Offerings:

BIO 504 Genetics (Spring 2020)

BIO 501 Biological Chemistry (Summer I 2020)

BIO 505 Human Physiology (Summer II 2020)

BIO 502 Cell Biology (Fall 2020)

BIO 503 Systems Biology (Late Fall 2020)

BIO 506 Microbiology (Spring 2021)

## CHEM-T 530 Organic Spectroscopy

### **Indiana University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Develops a basic understanding of various theories behind IR, MS, and NMR spectroscopy, concentration on the interpretation of spectra, and the information they can provide about details of molecular structure

Related Offerings:

CHEM T 520 Organic Synthesis (Spring 2020)

CHEM-T 530 Organic Spectroscopy

CHEM-T 540 Physical Chemistry (Fall 2020)

CHEM T 590 Chemistry Capstone (Summer I 2020)

CHEM 510 Inorganic Chemistry (Spring 2021)

## CHEM-T 540 Physical Chemistry

### **Indiana University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: This is a graduate level course that will touch on all the fundamental areas of

Physical Chemistry (kinetics, thermodynamics, equilibrium, quantum).

Emphasis is placed on content that expands the students' knowledge in these key areas and relates to concepts that are likely to be taught in introductory chemistry courses.

Related Offerings:

CHEM T 520 Organic Synthesis (Spring 2020)

CHEM-T 530 Organic Spectroscopy (Fall 2020)

CHEM T 590 Chemistry Capstone (Summer I 2020)

CHEM 510 Inorganic Chemistry (Spring 2021)

## IT 600 Ethics in Information Tech

### **Valparaiso University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: Designed to introduce the scholar to concepts of Philosophy relative to Ethics and apply those concepts to the field of information technology

Sequential Offerings:

IT 502 Introduction to Programming (Spring 2020)

IT 510 Introduction to IT (Summer I 2020)

IT 533 Data Mining (Summer II 2020)

IT 632 Instructional Design in IT (Summer II 2020)

IT 600 Ethics in Information Technology (Fall 2020)

IT 560 Mobile Computing (Spring 2021)

IT 540 Web Programming (Summer I 2021)

## Math 505 Statistical Methods I

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: Presents a variety of statistical topics in the context of real world data; demonstrates the broad applicability of advanced statistical techniques

Related Offerings:

Math 502 Abstract Algebra (Spring 2020)

Math 504 Real Analysis (Summer I 2020)

Math 501 Linear Algebra (Summer II 2020)

Math 505 Statistical Methods (Fall 2020)

Math 506 Modern Geometry (Late Fall 2020)

Math 503 Advanced Calculus (Spring 2021)

## Math 506 Modern Geometry

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: Offers a critical presentation of the development and philosophical significance of non-Euclidean geometry

Related Offerings:

Math 502 Abstract Algebra (Spring 2020)

Math 504 Real Analysis (Summer I 2020)

Math 501 Linear Algebra (Summer II 2020)

Math 505 Statistical Methods (Fall 2020)

Math 506 Modern Geometry (Late Fall 2020)

Math 503 Advanced Calculus (Spring 2021)

## Math 527 Applied Linear Algebra

**Saint Mary's College**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: Two semesters of calculus

Topics: Matrices, gaussian elimination, vector spaces, determinants, inner products, orthogonality, least squares solution, eigenvalue problems, Gram-Schmidt process, matrix decomposition/factorization, Jordan canonical forms, methods of dimension reduction such as singular value decomposition or principal component analysis, quadratic forms, pseudo-inverses, Markov processes, data/image processing, and other advanced topics pertinent to data analysis.

## Math 541 Probability

**Indiana State University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: Calculus III and Discrete Math or equivalent

Topics: The formulation of probability problems in a mathematical manner and the techniques for their solution.

Related Offerings:

Math 511 Theory of Numbers (Spring 2020)

Math 604 Euclidean Concepts of Geometry (Summer I 2020)

Math 541 Probability (Fall 2020)

Math 542 Mathematical Statistics (Spring 2021)

Math 512 Abstract Algebra (Summer I 2021)

## PHYS 504 Intro to Quantum Mechanics

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: PHYS-501 or equivalent (recommend PHYS-502, PHYS-503 or equivalents)

Topics: Reviews special relativity and provides an introduction to quantum mechanics; covers applications in nuclear and particle physics and develops key aspects of quantum theory via various extensions of the Stern-Gerlach experiment

Sequential Offerings:

Physics 501 Mathematical Methods in Physics (Spring 2020)

Physics 502 Classical Mechanics (Summer I 2020)

Physics 503 Electromagnetism (Summer II 2020)

Physics 504 Intro to Quantum Mechanics (Fall 2020)

Physics 505 Quantum Mechanics II (Spring 2021)

Physics 506 Thermodynamics and Statistical Mechanics (Summer 2021)

# Fall 2020

# Undergraduate Courses

## BIO 251 Bioethics

**Saint Mary of the Woods College**

Undergraduate Credit Hours: 3

Format: Online

Teacher Level: Grade K-12

Prerequisite: None

Topics: Explores ethical theories and ethical issues as they relate to biology and health care; topics include patient autonomy, confidentiality, informed consent, human research, end-of-life decisions and care, and social justice and health care

Related Offerings:

BIO 274 Intro Microbiology & BIO 274L Intro Microbiology Lab (Summer II 2020)

# Fall 2020 Conferences, Raffles, & Workshops

## **Conferences** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

TBD

## **Raffle** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

### LED Name Badge Classroom Kit

Format: Online Promotion from STEM Teach

Description: In place of conference scholarships for the Fall 2020 semester, STEM Teach will be raffling off classroom kits for teachers to use when they return to the classroom. Fall 2020 registration includes an offering to win an LED Name Badge Classroom Kit. We have 4 kits to give away and only 50 registrations for the drawing will be accepted. Kits will be mailed to teachers in early August. Check out the LED Name Badge Classroom Kit at this link to learn more. <https://www.browndoggadgets.com/collections/new-classroom-sets/products/led-name-badge?variant=12727813242922>

Recommended Age for Kit: Ages 10 and up (future drawings will focus on other grade levels)

## **Workshops** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for specific days and times)

### ***UNIVERSITY OF INDIANAPOLIS, INDIANAPOLIS, IN, MARION COUNTY***

#### Crafting, Coding and Circuitry

Format: Online

Description: Focuses on the utilization of a maker space within a formal learning environment such as a school, library or museum to promote problem-solving, self-directed learning and collaborative work

PGP Points: 25 Hours

Teacher Level: Grade K-8

# Winter/Spring 2021 Graduate Courses

## BIO 506 Microbiology

**Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Examines the structure, physiology, and activities of pathogenic and non-pathogenic microorganisms with an emphasis placed on the interaction of microorganisms with each other, their hosts, and the environment

Related Offerings:

BIO 504 Genetics (Spring 2020)

BIO 501 Biological Chemistry (Summer I 2020)

BIO 505 Human Physiology (Summer II 2020)

BIO 502 Cell Biology (Fall 2020)

BIO 503 Systems Biology (Late Fall 2020)

BIO 506 Microbiology (Spring 2021)

## BIO 647 - Experimental Morphogenesis of Vascular Plants

**Indiana State University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: A discussion-laboratory course with emphasis on modern experimental approaches to the study of reproductive processes and mechanisms, organization, floral morphology, embryology, and formation of fruits and seeds

Related Offerings:

None

## CHEM 510 - Inorganic Chemistry

**Indiana University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: TBD

Related Offerings:

CHEM-T 520 Organic Synthesis (Spring 2020)

CHEM-T 530 Organic Spectroscopy (Fall 2020)

CHEM-T 590 Chemistry Capstone (Summer I 2020)

CHEM 510 Inorganic Chemistry (Spring 2021)

# DSCI 511 Data Preprocessing and Visualization

## **Saint Mary's College**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: Familiarity with programming (we will work with Javascript, R, maybe python)

Topics: Introduces data visualization tools, methods, and techniques that increase the understanding of complex data; includes design principles, perception, color, statistical graphs, maps, trees and networks, high-dimensional data, and others; takes a holistic approach to visualization, from data collection to interface design to user evaluation; exposure to an assortment of technologies, starting with JavaScript's D3, R (Shiny), python (several visualization libraries), and various public APIs (Twitter, Google Maps)

Related Offerings:

None

# IT 560 Mobile Computing

## **Valparaiso University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: IT 502

Topics: Provides experience creating applications in a mobile device environment such as Android, iOS, or Windows Mobile; topics include the model, view, controller paradigm, user interaction, hardware device interaction, and common patterns of application behavior

Sequential Offerings:

IT 502 Introduction to Programming (Spring 2020)

IT 510 Introduction to IT (Summer I 2020)

IT 533 Data Mining (Summer II 2020)

IT 632 Instructional Design in IT (Summer II 2020)

IT 600 Ethics in Information Technology (Fall 2020)

IT 560 Mobile Computing (Spring 2021)

IT 540 Web Programming (Summer I 2021)

# Math 503 Advanced Calculus

## **Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: None

Topics: An advanced multivariate treatment of calculus; includes advanced treatment of differentiation and integration as well as advanced topics including Fourier Series and special functions

Related Offerings:

Math 502 Abstract Algebra (Spring 2020)

Math 504 Real Analysis (Summer I 2020)

Math 501 Linear Algebra (Summer II 2020)

Math 505 Statistical Methods (Fall 2020)

Math 506 Modern Geometry (Late Fall 2020)

Math 503 Advanced Calculus (Spring 2021)



## Math 542 Mathematical Statistics

### **Indiana State University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: TBD

Related Offerings:

Math 511 Theory of Numbers (Spring 2020)

Math 604 Euclidean Concepts of Geometry (Summer I 2020)

Math 541 Probability (Fall 2020)

Math 542 Mathematical Statistics (Spring 2021)

Math 512 Abstract Algebra (Summer I 2021)

## PHYS 505 Quantum Mechanics II

### **Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Reviews more advanced topics in spin systems and the wave mechanics formulation of quantum mechanics; various problems in one and three dimensions, along with some introductory topics in quantum field theory will be covered

Sequential Offerings:

Physics 501 Mathematical Methods in Physics (Spring 2020)

Physics 502 Classical Mechanics (Summer I 2020)

Physics 503 Electromagnetism (Summer II 2020)

Physics 504 Intro to Quantum Mechanics (Fall 2020)

Physics 505 Quantum Mechanics II (Spring 2021)

Physics 506 Thermodynamics and Statistical Mechanics (Summer 2021)

## PSY 518 Cognitive Neuroscience

### **University of Saint Francis**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Focuses on the neurological basis of behavior including neuroanatomy, synaptic transmission, and basic sensory and motor processes, framed within a cognitive theoretical approach investigating memory, language, and other higher cognitive functions

Related Offerings:

PSY 506 Social Psychology (Summer II 2020)

PSY 518 Cognitive Neuroscience (Spring 2021)

PSY 515 Abnormal Psychology (Summer I 2021)

# Winter/Spring 2021 Undergraduate Courses

## CS 101 Fundamentals of Computing

### **Indiana State University**

Undergraduate Credit Hours: 3

Format: Online

Teacher Level: Grade K-12

Prerequisite:

Topics: TBD

Related Offerings:

CS 151 Intro to Computer Science (Spring 2020)

ITSC 121 Computer Programming I (Python) (Spring 2020)

ITSC 122 Computer Programming II (Python) (Summer I 2020)

## Math 111 Basic Probability & Statistics

### **Bethel University**

Undergraduate Credit Hours: 3

Format: Online

Teacher Level: Grade K-12

Prerequisite:

Topics: TBD

# Winter/Spring 2021 Conferences, Raffles, & Workshops

## **Conferences** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

TBD

## **Raffle** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

In place of conference scholarships for the Winter/Spring 2021 semester, STEM Teach will be raffling off classroom kits for teachers to use in the classroom. Winter/Spring 2021 registration includes an offering to win one of the following classroom kits and teachers can register for one of three raffles below.

### Dot Creativity Kit & Robot

Format: Online Promotion from STEM Teach

Description: This kit is designed for adventure, fun and learning at an affordable price, the kit combines Do-it-Yourself projects with a quirky green robot and hundreds of self-guided coding challenges. We have 2 kits and robots to give away and only 50 registrations for the drawing will be accepted. Kits will be mailed to teachers in mid-December. Learn more about this kit at <https://www.makewonder.com/robots/dot-creativity-kit/>

Recommended Age for Dot: Grades K-5

### Paper Circuitry Classroom Kit

Format: Online Promotion from STEM Teach

Description: Perfect for putting the “A” in STEAM, Paper Circuits are made with LEDs, coin cell batteries, Maker Tape™, and everyday craft supplies. The Paper Circuits Kit allows students to learn about circuitry through the use of nylon tape rather than wires. Use printable PDF instructions and templates from Brown Dog Gadgets, or create your own designs to light up a craft. We have 2 kits to give away and only 50 registrations for the drawing will be accepted. Kits will be mailed to teachers in early December. Learn more about this kit at <https://www.browndoggadgets.com/products/paper-circuits-conductive-tape-kit?variant=30865056594>

Recommended Age for Kit: Grades 6-9

### Ping Pong Launcher 2.0 Classroom Set

Format: Online Promotion from STEM Teach

Description: Build your own Projectile Launcher - send ping pong balls flying, marking the trajectory and distance of your shots and targets. The Build Guide will get you started. Redesign your launcher with greater accuracy and precision through the optional labs and graphing sheets, then compete in exciting design challenges. Change one variable at a time, utilizing scientific and engineering methods to successfully hit targets. Comes with Instructables from Teacher Geek and lesson plan aligned to the Indiana State Standards in Science, Engineering, and Mathematics from 1st Maker Space. We have 2 kits to give away and only 50 registrations for the drawing will be accepted. Kits will be mailed to teachers in mid-December. Learn more about this kit at [https://1stmakerspace.com/products/ping-pong-ball-launcher?\\_pos=1&\\_sid=7dd5c784e&\\_ss=r](https://1stmakerspace.com/products/ping-pong-ball-launcher?_pos=1&_sid=7dd5c784e&_ss=r)

Recommended Age for Kit: Grades 9-12

**Workshops** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for specific days and times)

TBD - All Winter/Spring 2021 workshops will be online.

# Summer I 2021 Graduate Courses

## CHEM - TBD

### **Indiana University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: TBD

Related Offerings:

CHEM T 520 Organic Synthesis (Spring 2020)

CHEM-T 530 Organic Spectroscopy

CHEM-T 540 Physical Chemistry

CHEM T 590 Chemistry Capstone (Summer I 2020)

CHEM 510 Inorganic Chemistry (Spring 2021)

## IT 540 Web Programming

### **Valparaiso University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite: IT 500 or consent from instructor

Topics: An introduction to web technology covering a number of specific systems such as HTML, PHP, MySQL, javaScript, and XML; a laboratory component provides hands-on experience

Sequential Offerings:

IT 502 Introduction to Programming (Spring 2020)

IT 510 Introduction to IT (Summer I 2020)

IT 533 Data Mining (Summer II 2020)

IT 632 Instructional Design in IT (Summer II 2020)

IT 600 Ethics in Information Technology (Fall 2020)

IT 560 Mobile Computing (Spring 2021)

IT 540 Web Programming (Summer I 2021)

## Math 512 Abstract Algebra

### **Indiana State University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: An introduction to groups, rings, and fields, including polynomial rings, divisibility, and unique factorization domains

Related Offerings:

Math 511 Theory of Numbers (Spring 2020)

Math 604 Euclidean Concepts of Geometry (Summer I 2020)

Math 541 Probability (Fall 2020)

Math 542 Mathematical Statistics (Spring 2021)

Math 512 Abstract Algebra (Summer I 2021)

# PHYS 506 Thermodynamics and Statistical Mechanics

## **Indiana Wesleyan University**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Develops the laws of thermodynamics from macroscopic observations and then demonstrates how they arise from the statistical, collective behavior of atoms and molecules

Sequential Offerings:

Physics 501 Mathematical Methods in Physics (Spring 2020)

Physics 502 Classical Mechanics (Summer I 2020)

Physics 503 Electromagnetism (Summer II 2020)

Physics 504 Intro to Quantum Mechanics (Fall 2020)

Physics 505 Quantum Mechanics II (Spring 2021)

Physics 506 Thermodynamics and Statistical Mechanics (Summer 2021)

# PSY 515 Abnormal Psychology

## **University of Saint Francis**

Format: Online

Graduate Credit Hours: 3

Teacher Level: Grade 9-12

Prerequisite:

Topics: Focuses upon developing an understanding of individual, group, and cultural pathology including historical perspective, diagnostic classification, etiology, symptom manifestation, treatment approaches, and prevention

Related Offerings:

PSY 506 Social Psychology (Summer II 2020)

PSY 512 Theories of Personality (Fall 2020)

PSY 518 Cognitive Neuroscience (Spring 2021)

PSY 515 Abnormal Psychology (Summer I 2021)

# Summer I 2021 Undergraduate Courses

TBD

# Summer I 2021

## Conferences, Raffles, & Workshops

### **Conferences** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

TBD

### **Raffle** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for updated information)

TBD

### **Workshops** (Visit [www.stemteachindiana.org](http://www.stemteachindiana.org) for specific days and times)

#### ***BETHEL UNIVERSITY, MISHAWAKA, IN, ST. JOSEPH COUNTY***

##### **CS Bootcamp for K-5 Teachers**

Format: Face-to-face format at Bethel University

Description: Prepares elementary teachers to incorporate the Indiana Computer Science Standards into their curriculum to include digital citizenship, data representation, programming, and sorting and searching

PGP Points: 6 Hours

Teacher Level: Grade K-5

##### **Help! Integrating Computer Science Across the Curriculum**

Format: Face-to-face format at Bethel University

Description: Designed to help teachers in other disciplines develop a plan for integrating cs standards across the curriculum

PGP Points: 6 Hours

Teacher Level: Grade 6-8

##### **Implementing 1-1 Technology**

Format: Face-to-face format at Bethel University

Description: Designed to help elementary and middle school teachers with effective implementation of 1-1 technology

PGP Points: 6 Hours

Teacher Level: Grade K-8

#### ***BUTLER UNIVERSITY, INDIANAPOLIS, IN, MARION COUNTY***

##### **The Science of Wellness for Teachers**

Format: Face-to-face format at Butler University

Description: Explores the importance of the science behind teacher wellness; explores beginning concepts of neuroscience and neuroanatomy; hands-on activities on the benefits of breath, teacher regulation, stress reduction and preventative wellness

PGP Points: 6 Hours

Teacher Level: Grade K-8



## STEM Stories

Format: Face-to-face format at Butler University

Description: Explores science concepts and activities in connection with a wide variety of children's literature science biographies; teachers will engage in coding activities while learning about Ada Lovelace through elementary level children's books

PGP Points: 6 Hours

Teacher Level: Grade K-8

## ***HUNTINGTON UNIVERSITY, HUNTINGTON, IN, HUNTINGTON COUNTY***

### Effective STEM Integration

Format: Face-to-face at Huntington University

Description: Participants will reflect on effective ways to integrate STEM disciplines after considering both effective and ineffective examples

PGP Points: 6 Hours

Teacher Level: Grade K-5

### Integrating STEM & Language Arts

Format: Face-to-face at Huntington University

Description: Participants will develop a Project Based Learning unit that integrates science and language arts

PGP Points: 6 Hours

Teacher Level: Grade K-5

### Integrating STEM & Special Needs in Elementary

Format: Face-to-face at Huntington University

Description: Explore the integration of STEM opportunities for exceptional learners at the elementary level

PGP Points: 6 Hours

Teacher Level: Grade K-5

### Integrating STEM & Special Needs in Middle/High School

Format: Face-to-face at Huntington University

Description: Explore the integration of STEM opportunities within a special education self-contained setting and/or within a Life Skills program at the middle and/or high school level

PGP Points: 6 Hours

Teacher Level: Grade 6-12

### Introduction to Programming Using Python

Format: Face-to-face at Huntington University

Description: Introduces data types and variables, control structures (sequencing, looping, branching) and modularity using functions

PGP Points: 12 Hours

Teacher Level: Grade 9-12

## Introduction to Web Development

Format: Face-to-face at Huntington University

Description: Introduces web development using HTML and CSS; no prior coding experience needed

PGP Points: 6 Hours

Teacher Level: Grade 6-12

## Teaching Visualization of STEM topics with RStudio

Format: Face-to-face at Huntington University

Description: Participants will learn how to use R, a powerful and free software package, to enhance mathematics teaching

PGP Points: 6 Hours

Teacher Level: Grade 9-12

## **INDIANA STATE UNIVERSITY, TERRE HAUTE, IN, VIGO COUNTY**

### Teaching 6-8 Computer Science in Indiana

Format: Face-to-face at Indiana State University

Description: Brings educators up-to-date on computer science grade 6–8 standards in Indiana and builds skills and knowledge in content and pedagogy needed to meet the CS standards

PGP Points: 6 Hours

Teacher Level: Grade 6-8

### Teaching K-5 Computer Science in Indiana

Format: Face-to-face at Indiana State University

Description: Brings educators up-to-date on computer science grade K-5 standards in Indiana and builds skills and knowledge in content and pedagogy needed to meet the CS standards

PGP Points: 6 Hours

Teacher Level: Grade K-5

### Teaching Programming Intro

Format: Face-to-face at Indiana State University

Description: Builds basic programming skills which are needed in teaching different computing courses in high school; builds skills in developing assignments and assessing student work

PGP Points: 6 Hours

Teacher Level: Grade 6-12

### Teaching Science as Inquiry

Format: Face-to-face at Indiana State University

Description: Designed to help elementary school teachers develop the necessary knowledge and skills so they can implement inquiry-based, developmentally appropriate science lessons

PGP Points: 16 Hours

Teacher Level: Grade K-5

## **INDIANA WESLEYAN UNIVERSITY, MARION IN, GRANT COUNTY**

### **A Field Trip to the Particle Zoo**

Format: Face-to-face at Indiana Wesleyan University

Description: So, what do you say when your son or daughter asks you about quarks because it was on the ACT exam? Can you follow superheros in a Marvel movie as they discuss the quantum realm or multiverse? When an image of a black hole shows up on your social media feed, will you be able to converse about it confidently? If not, this workshop is for you and anyone else who would like to catch up on some basic and more recent aspects of physics. By the end of the session, you will be able to discuss physics concepts with your kids, colleagues, or social media buddies with scientific confidence. Taught by an education professor experienced in teaching science to elementary teacher candidates.

PGP Points: 6 Hours  
Teacher Level: K-12

## **OAKLAND CITY UNIVERSITY, OAKLAND CITY, IN, GIBSON COUNTY**

### **Robotic U Phase I**

Format: Face-to-face at Oakland City University

Description: Provides the scientific concepts and instructions to guide the students on how to build robots using robotic kits and participate in robotics competitions

PGP Points: 30 Hours  
Teacher Level: Grade 6-9

### **Robotic U Phase II**

Format: Face-to-face at Oakland City University

Description: Provides the scientific concepts and the instructions to guide high school students on how to build their own robots creating their own parts

PGP Points: 30 Hours  
Teacher Level: Grade 10-12

### **Teaching of Chemistry for Elementary Educators**

Format: Hybrid of online & face-to-face at Oakland City University

Description: Pre-workshop learning activities and interactive workshop to equip teachers with chemistry content knowledge, classroom materials, and fun hands-on experiments that they can replicate in their own classrooms; topics include matter, measurement, chemical and physical properties, atomic structure and periodicity, conservation of mass, chemical bonding, and acids and bases

PGP Points: 12 Hours  
Teacher Level: Grade K-5

### **The ABC of Robotics**

Format: Face-to-face at Oakland City University

Description: Provides the basic scientific concepts of the mechanics of robotics and how to apply these concepts when building robots

PGP Points: 18 Hours  
Teacher Level: Grade K-5

# ***SAINT MARY'S COLLEGE, NOTRE DAME, IN, ST. JOSEPH COUNTY***

## **Introduction to Microsoft Excel**

Format: Face-to-face at Saint Mary's College

Description: Overview and demonstration of various Excel topics followed by hands-on practice and time to ask questions

PGP Points: 6 Hours

Teacher Level: K-12

## **Putting the M in STEM**

Format: Face-to-face at Saint Mary's College

Description: Discuss a range of practical activities that could be offered either as an integral part of their lessons or as activities for an after-school STEM club

PGP Points: 6 Hours

Teacher Level: Grade 6-8

## **Taking Mathematics Outside the Classroom**

Face-to-face format at Saint Mary's College

Description: Learn about math trails and how they can be used to develop mathematical skills and developing a math circus; a range of hands-on activities for developing and practicing skills and knowledge

PGP Points: 6 Hours

Teacher Level: Grade K-12

## **Using Rich Mathematical Activities Part 5**

Format: Face-to-face at Saint Mary's College

Description: Teachers will learn about math trails, how they are used, what makes a good question, health and safety issues involved when running a math trail, will undertake a math trail as a learner and then begin to develop their own trail

PGP Points: 6 Hours

Teacher Level: Grade K-12

Sequential Offerings: Using Rich Mathematical Activities Parts 1-5