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About the Hoosier Stem Academy
The Hoosier STEM Academy is a partnership among Ball State University, IUPUI, and Purdue University to provide graduate-level STEM courses for current Indiana STEM teachers who wish to be credentialed to teach dual credit courses. Courses are designed specifically to meet the needs of Indiana high school teachers, including courses that use online, blended, and/or distance education instructional designs, as well as traditional face-to-face options. STEM teachers who wish to participate must currently teach in underserved Indiana school corporations and Indiana schools experiencing a shortage of qualified STEM teachers. Participants will also be invited to participate in the Hoosier STEM Academy Mentoring Conference. Upon completion of a course with a grade of C or better, participants will receive a $1,375 stipend to help cover the cost of tuition, fees, and materials.

The Hoosier STEM Academy is now launching the Fall 2020 course catalog. Instruction for how to apply and register for courses at each of the partner institutions follow the list of offerings. Be sure to read carefully as each campus may have slightly different procedures at this time. Participants may take up to two courses per semester, but may only take a total of 15 hours over the four program semesters. Because graduate courses are challenging, it is suggested that participants take only one course per semester during the academic year.

Note: Any participant who registers for a course through the Hoosier STEM Academy is responsible for checking with their dual credit provider institution that the course will count toward their dual credit credential.
Application Process

1. Go to [http://graduate.iupui.edu/admissions/apply.shtml](http://graduate.iupui.edu/admissions/apply.shtml)

2. Click on: Begin your application for graduate or professional school at IUPUI

3. If you are new to IUPUI: click on “Create New Guest Account”.

4. If you have been an IU or IUPUI student in the past, you will need access to our university e-mail and passphrase, including a new feature at IU that requires an additional dual authentication or “Duo” log-in.
   - We recommend that you complete this initial registration step with assistance from UITS, by calling our help desk, available 24/7 at (317) 247-HELP or [https://kb.iu.edu/d/abxl#iupui](https://kb.iu.edu/d/abxl#iupui). They will walk you through the initial process to regain access to your IU/IUPUI account, reset your passphrase, and assist you with the new Duo authentication.
   - Once you have your IU log-in information, Click on “Log in with Guest acct/User ID”

Application Steps

The first screen asks about your intentions by selecting one of two options:

   Either choice below is acceptable for Hoosier STEM Academy. However, we recommend that you apply as a Graduate Non-Degree (GND) Student initially:

   - To apply to a degree (Master's, PhD, professional) or Graduate Certificate program (Select this only if you are certain you will complete a certificate or MS degree. This will require letters of recommendation, transcripts, a personal statement, and GRE scores).

   - To apply to a Graduate Non-degree (GND) Program to explore courses for future enrollment in a graduate/professional degree program or to take continuing education courses (We recommend selecting this option)

There are six sections to the on-line Graduate Non-Degree (GND) application.

1. Personal Information

2. Additional Information

3. Application Information (Academic Program: Grad Non-Degree; Academic Plan: Graduate Non-Degree program; Enrollment Summer 2018)

4. Department Information (Do not complete the red survey link for
“Departmental Information” – it is not needed for this program)

5. Affirmation Statement

6. Submit and Pay Fee ($60)

You **do not** have to send transcripts, letters of reference, or a personal statement as a GND Student.

Once you submit the application, you will receive an e-mail acceptance, usually within ~ 72 hours.

**Next Steps**

1. **For new IU/IUPUI Students:** Create your IU University username (e-mail address) and passphrase [https://one.iu.edu/task/ij/create-my-first-ij-account](https://one.iu.edu/task/ij/create-my-first-ij-account)

2. **Duo Authentication:** More information about the Duo phone app here: [https://kb.iu.edu/d/bfqm](https://kb.iu.edu/d/bfqm)

3. **Register for classes at the One.IU Student Center** ([One.iu.edu](https://one.iu.edu) → Student Center SIS)
   (Detailed instructions [https://ittraining.iu.edu/sis/sis-job-aids/cross-module-general-job-aids/student_center/Student_Registration.pdf](https://ittraining.iu.edu/sis/sis-job-aids/cross-module-general-job-aids/student_center/Student_Registration.pdf))

4. **Tuition and Fees:** Upon completion of a course with a grade of C or better, the Hoosier STEM Academy will send a stipend of $1,375 to each participant. At IUPUI, Graduate tuition is **$347.22** per credit hour plus fees. For a 3-credit hour course,
   
   Tuition: $1,041.66 plus Fees: $258.61 = Total Cost: $1,300.27
   Parking: $160 per semester =
   Total cost (with parking): $1,460.77

5. **Academic Calendar: Fall 2020:**
   [https://studentcentral.iupui.edu/calendars/official-calendar.html?term=Fall%202020&category=](https://studentcentral.iupui.edu/calendars/official-calendar.html?term=Fall%202020&category=)

6. **Parking Services:** A semester ST (student) pass costs ~$160.
   [https://parking.iupui.edu](https://parking.iupui.edu)

7. **To obtain your Crimson Card** (student ID) after acceptance to the Graduate School: [https://crimsoncard.iu.edu](https://crimsoncard.iu.edu). Your Crimson Card is a combination of: Official ID Card, Payment Card, Discount Card to local restaurants & attractions, Printing Card, and Library Card. Once you are on campus, plan to visit the Crimson Card office on the 2nd floor of the [IUPUI Campus Center](https://iupui.edu).

IU online course instructions
1. Getting Started – Using Online Class Search – Beginning your search is simple. You can search directly from the IU Online, online.iu.edu, by going to the ‘Classes’ tab on the menu at the top of the page. From there, if you select ‘Search Classes’ you will see a menu such as the example at the right. You can make your search as broad or specific as you need, but we suggest at minimum, filling out the ‘semester’ and putting in a keyword for a subject such as “statistics” or even “stats”. There is also the enhanced search if you need other specific options.

2. Need More Info – Getting Course Descriptions – If you’ve found a class you’re interested in, you use the One.IU public class search to find additional information, such as what time the class meets and the course description. You do not have to fill out every field, but at minimum you must select the ‘Institution’ (the campus), the ‘Term’, the ‘Course Career’, the ‘Subject’, and the ‘Mode of Instruction’ as highlighted in the example.

3. Register – Sign Up for the Class You Want – Once you’ve found a class you want to take; you need to register for it with the campus offering the course. For example, if you want to register for a physics course at IU East, you must register with IU East.

   If you are a current IU Student – To register for an online undergraduate or graduate course offered at your campus of enrollment, you can register through One.IU as you would for any other class. To register for an online graduate course at a campus other than your campus of enrollment, you must contact the graduate department offering the course. See more at http://online.iu.edu/classes/how-register.php

   If you are not a Current IU Student – You must first apply to the IU campus offering the course. To register for an online graduate course you must contact the department offering the course.

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~ We’re looking forward to working with you as a member of the Hoosier STEM Academy. Please contact me if you have any questions.

Sincerely,
Dr. Kathleen A. Marrs
Associate Professor of Biology
(317) 278-4551
kmarrs@iupui.edu
Questions

Please contact Kizmin M. Jones with questions: kmjones4@bsu.edu.
IUPUI Courses

Anatomy

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ANAT-D 502 Basic Histology

Lecture and laboratory instruction on the microscopic structure of the basic tissues and organs of the body. Previous exposure to gross anatomy principles and dissection encouraged.

4 Credits.

ANAT-D 700 Educational Research Practicum

This course is designed to provide students with structured and supervised educational research experiences, as well as critical reviews of individual performance.
2 Credits.

**ANAT –D 701 Translational Neuroscience**

This graduate course uses a multidisciplinary approach to integrate the basic with the clinical neurosciences in understanding the human nervous system and select neurological disorders. Particular emphasis will be placed on deficits of motor function resulting from injury or disease. The functional anatomy of the brain and spinal cord will be studied using histologic atlas cross-sections and neuroradiologic images. Working as interdisciplinary teams, doctoral students in the biomedical sciences and rehabilitation sciences will explore relevant clinical cases in team-based learning activities.

5 Credits.

**ANAT-D 860 Research**

1-10 Credits.

**ANAT-D 861 Seminar**

Required yearly for all graduate students in residence. Literature and research reports and discussions by faculty, students, and invited distinguished visitors.

1 Credit.

**ANAT-D 878 Anatomy Teaching Practicum**

This course is designed to provide each student with supervised teaching experiences in Gross Anatomy. Histology, and Neuroscience, as well as critical reviews of all teaching duties.

2 Credits.
Biochemistry and Molecular Biology

<table>
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<td>24997</td>
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<td>12:00 p.m.-1:00 p.m.</td>
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</table>

**BIOC-B 500 Introductory Biochemistry**

Structures of carbohydrates, proteins, lipids and nucleic acids. Basic principles of enzyme catalysis, protein synthesis, intermediary metabolism and nutrition.

3 Credits.

**BIOC-B 811 Advanced Intermediary Metabolism**

Tutorial instruction in specialized areas of metabolism.

1-3 Credits.

**BIOC-B 854 Introduction to Research**

Tutorial and laboratory instruction in biochemistry. Purpose is to introduce students in biochemistry to three different research programs.

1 Credit.
**BIOC-B 855 Research**

1-12 Credits.

**BIOC-B 890 Seminar**

1 Credit.

**Biology**

<table>
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<tr>
<th>TITLE</th>
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<td>BIOL-55600 Physiology I</td>
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<td>4:30 p.m.-5:45 p.m.</td>
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<td>BIOL-59500 Professional Skills Bio (Special Assignments-Purdue)</td>
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<td>10:30 a.m.-11:45 a.m.</td>
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<tr>
<td>BIOL- 69600 Seminar</td>
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<td>BIOL- 69600 Seminar</td>
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<td>BIOL-T 574 The Immune System and Disease</td>
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</table>

**BIOL-55600 Physiology I**

BIOL- 55900 Endocrinology

The study of hormone function. Consideration will be given to the role of hormones in growth, development, metabolism, homeostasis, and reproduction.

3 Credits.

BIOL- 56100 Immunology

Introduction to the basic principles and experimentation in cellular and humoral immunology.

3 Credits

BIOL- 56600 Developmental Biology

Principles of development with emphasis on concepts and experimental evidence for underlying mechanisms, including molecular, cellular, and supracellular approaches.

3 Credits.

BIOL- 69600 Seminar

Each semester there are several separate seminar offerings. They will likely be on the following topics: biochemistry, crystallography, ecology and population biology, genetics, mechanisms of development, microbiology, neurobiology, and plant physiology.

1 Credit.

BIOL-T 574 The Immune System and Disease

This course will introduce graduate students to immunology, focusing upon cells, molecules and mechanisms operating in the normal immune system and then assess the dysfunction associated with diseases and immune disorders.

3 Credits.
BIOL-T 574 The Immune System and Disease

This course will introduce graduate students to immunology, focusing upon cells, molecules and mechanisms operating in the normal immune system and then assess the dysfunction associated with diseases and immune disorders.

3 Credits.

Chemistry

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**CHEM- 69600 Chemical Analysis Of Alcohol and Drugs (Special Topics in Chemistry)**

- Lecture
- 3 Credits
- 3:30 p.m. – 4:15 p.m.
- TR
- 25059
- Open

**CHEM-69600 Biomimetic Chemistry (Special Topics in Chemistry)**

- Lecture
- 3 Credits
- 6:00 p.m. – 7:15 p.m.
- MW
- 29572
- Open

**CHEM- 59900 Special Assignment**

Directed reading or special work not included in other courses.

1-4 Credits

**CHEM-69500 Seminar**

Group meeting for review and discussion of important current literature in analytical, biological, inorganic, organic, and physical chemistry. Each graduate student is required to attend the seminar of his/her major subject.

0-1 Credit

**CHEM- 69600 Special Topics in Chemistry**

Lectures on selected topics of current interest.

1-3 Credits

**Computer Science**
### CSCI- 53600 Data Communication and Computer Networks

Data communications: communication hardware technologies including local area and long-haul network hardware, circuit and packet switching, interfaces between computer and network hardware, and performance issues. Network architecture: protocol software and conceptual layering, reliable delivery over an unreliable channel, transport protocols, virtual circuits, datagrams, Internet working as a fundamental design concept, the client-server paradigm, naming and name binding, name servers, addressing and address resolution, routing and routing algorithms, congestion and flow control techniques, network file systems, distribution of computation, DARPA Internet protocols (TCP/IP) as examples of protocol organization.

3 Credits.

### CSCI- 59000 Topics in Computer Science

Directed study for students who wish to undertake individual reading
and study on approved topics.

3 Credits.

**Geology**

<table>
<thead>
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<td>For authorization, have your advisor contact the department at <a href="mailto:geology@iupui.edu">geology@iupui.edu</a></td>
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GEOL-G 700 GEOLOGIC PROBLEMS

Consideration of special geological problems.

1-5 Credits

GEOL-G 810 Research

1-12 Credits

Mathematics

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<th>TITLE</th>
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<tr>
<td>MATH-51100 Linear Algebra with Applications</td>
<td>Lecture 3</td>
<td>22612</td>
<td>Open</td>
<td>4:30 p.m. - 5:45 p.m.</td>
<td>MW</td>
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<td>MATH-5110 Linear Algebra with Applications</td>
<td>Lecture 3</td>
<td>25644</td>
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<tr>
<td>MATH-52500 Intro to Complex Analysis</td>
<td>Lecture 3</td>
<td>22987</td>
<td>Open</td>
<td>9:00 a.m. - 10:15 a.m.</td>
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<td>MATH-53700 Applied Mathematics for Scientists and Engineers I</td>
<td>Lecture 3</td>
<td>22614</td>
<td>Open</td>
<td>6:00 p.m. - 7:15 p.m.</td>
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<td>MATH-57100 Elementary Topology</td>
<td>Lecture 3</td>
<td>27733</td>
<td>Open</td>
<td>3:00 p.m.-4:15 p.m.</td>
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<td>It is expected that students have completed MATH 44400</td>
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<td>MATH-59800 Biomath Graduate</td>
<td>Lecture 3</td>
<td>26390</td>
<td>Open</td>
<td>3:00 p.m.-</td>
<td>MW</td>
<td>Graduate Student Seminar</td>
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<td>Student Seminar (Topics in Math)</td>
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<td>23211</td>
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<td>Before registering, student must contact individual math professor for course requirements and department permission. For more information call the Math Department at (317) 274-6918</td>
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<td>Student must contact individual math professor for course requirements and department permission. For more information call the Math Department at (317) 274-6918</td>
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<td>MATH-69400 Topics in</td>
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<td>Differential Equations</td>
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<tr>
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<td>MATH-69700 Topics in Topology</td>
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<td>Student must contact individual math professor for course requirements and department permission. For more information call the Math Department at (317) 274-6918</td>
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**MATH-5110 Linear Algebra with Applications**

Real and complex vector spaces; linear transformations; Gram-Schmidt process and projections; least squares; QR and LU factorization; diagonalization, real and complex spectral theorem, Shur triangular form; Jordan canonical form, quadratic forms.

3 Credits.
**MATH-52500 Intro to Complex Analysis**

Complex numbers and complex-valued functions; differentiation of complex functions; power series, uniform convergence; integration, contour integrals; elementary conformal mapping.

3 Credits.

**MATH-53700 Applied Mathematics for Scientists and Engineers I**

This course will cover theories, techniques and applications of partial differential equations, Fourier transforms, and Laplace transforms. The overall emphasis of the course will be on applications to physical problems.

3 Credits.

**MATH-57100 Elementary Topology**

Fundamentals of point set topology with a brief introduction to the fundamental group and related topics; topological and metric spaces; compactness and connectedness; separation properties; local compactness; introduction to function spaces; basic notions involving deformations of continuous paths.

3 Credits.

**MATH-59800 Topics in Math**

Supervised reading courses as well as dual-level special topics courses are given under this number.

0-3 Credits.

**MATH-69200 Topics in Applied Mathematics**

Research topics of current interest in applied mathematics to be chosen by the instructor.

1-3 Credits.
MATH- 69300 Topics in Analysis

Research topics in analysis and their relationships to other branches of mathematics. Topics of current interest will be chosen by the instructor.

1-3 Credits.

Math-69400 Topics in Differential Equations

Research topics in differential equations related to physics and engineering. Topics of current interest will be chosen by the instructor.

1-3 Credits.

MATH- 69700 Topics in Topology

Research topics in topology and their relationships to other branches of mathematics. Topics of current interest will be chosen by the instructor.

1-3 Credits.

**Physiology**

<table>
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<td>PHSL-F 701 Research in Physiology</td>
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<td>PHYSL-F 780 Special Topics in Physiology</td>
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**PHSL-F 595 Advanced Physiology**

1-15 Credits

**PHSL-F 701 Research in Physiology**

1-15 Credits

**PHSL-F 780 Special Topics in Physiology**

0-24 Credits

**Physics**

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<td>PHYS-68500 Physics Seminar</td>
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**PHYS-59000 Reading and Research**

Reading and research in Physics.

1-6 Credits.

**PHYS-68500 Physics Seminar**

0 Credits.

**Statistics**
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<td>STAT-51200</td>
<td>Applied Regression Analysis</td>
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<td>3</td>
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<td>STAT-51500</td>
<td>Statistical Consulting Problems</td>
<td>Independent Study</td>
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<td>STAT-51600</td>
<td>Basic Probability and Applications</td>
<td>Lecture</td>
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<td>STAT-51900</td>
<td>Introductory Probability</td>
<td>Lecture</td>
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<td>It is expected that student have completed MATH 26100. STAT 51900 will include an optional problem solving session on Friday from 11:45 a.m.-1:00 p.m.</td>
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<td>STAT-52100</td>
<td>Statistical Computing</td>
<td>Lecture</td>
<td>3</td>
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<td>12:00 p.m.-1:15 p.m.</td>
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<td>STAT-52400</td>
<td>Applied Multivariate Analysis</td>
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<td>STAT-52501</td>
<td>Generalized Linear Models</td>
<td>Lecture</td>
<td>3</td>
<td>24899</td>
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<td>3:00 p.m.-4:15 p.m.</td>
<td>MW</td>
<td>It is expected that student have completed STAT 52800</td>
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**STAT- 51200 Applied Regression Analysis**

Inference in simple and multiple linear regression, residual analysis, transformations, polynomial regression, model building with real data, nonlinear regression. One-way and two-way analysis of variance, multiple comparisons, fixed and random factors, analysis of covariance.
Use of existing statistical computer programs.

3 Credits.

**STAT-51500 Statistical Consulting Problems**

A written report of a consultation problem involving a designed experiment or sample in which the student participates with a faculty member.

1-3 Credits

**STAT- 51600 Basic Probability and Applications**

A first course in probability, intended to serve as a background for statistics and other applications. Sample spaces and axioms of probability, discrete and continuous random variables, conditional probability and Bayes' theorem, joint and conditional probability distributions, expectations, moments and moment generating functions, law of large numbers and central limit theorem.

3 Credits.

**STAT- 51900 Introductory Probability**

Algebra of sets, sample spaces, combinatorial problems, conditional probability, independence, random variables, distribution functions, moment generating functions, special distributions, limit theorems.

3 Credits

**STAT- 52100 Statistical Computing**

A broad range of topics involving the use of computers in statistical methods. Collection and organization of data for statistical analysis; transferring data between statistical applications and computing platforms; techniques in exploratory data analysis; comparison of statistical packages, such as SAS and SPlus.

3 Credits.
**STAT- 52400 Applied Multivariate Analysis**

Extension of univariate tests in normal populations to the multivariate case, equality of covariance matrices, multivariate analysis of variance, discriminant analysis and misclassification errors, canonical correlation, principal components, factor analysis. Strong emphasis will be placed on use of existing computer programs.

3 Credits.

**STAT- 52501 Generalized Linear Models**


3 Credits.