HOOSIER STEM ACADEMY

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

Course Catalogue
IUPUI
Summer 2021

IUPUI

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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 $1,400 stipend to help cover the cost of tuition, fees, and materials.

The Hoosier STEM Academy is now launching the Summer 2021 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 here and choose the semester you are applying for.**

2. Effective September 3, 2019, IUPUI moved to a new application called the Indiana University Graduate Centralized Application System (CAS) in partnership with Liaison International. This application allows applicants the ability to apply to multiple programs within the Indiana University campus system, including Purdue programs on the IUPUI campus. **Please use the IU Graduate CAS Application to apply.**

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. 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**"

5. The first screen asks about your intentions by selecting one of two options: Degree Seeking/Graduate Certificate or Graduate Non-degree

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)**

6. 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 here.
2. **Duo Authentication**: More information about the Duo phone app here:
3. **Register for classes at the One.IU Student Center** (One.iu.edu → Student Center SIS)

   (Detailed instructions here)

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 $1,400 to each participant. Click here for 2020-2021 approved tuition and fees.**
5. **Academic Calendar: Summer 2021**
6. **Parking Services:** A semester ST (student) pass costs ~$160. Parking and Transportation Services
7. **To obtain your Crimson Card** (student ID) after acceptance to the Graduate School click here 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 Campus Center.

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.
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IUPUI Courses

Anatomy and Cell Biology

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
ANAT-D 700 Educational Research Practicum	Practicum	2	10287	Open	ARR	ARR	Summer Session 1
ANAT-D 700 Educational Research Practicum	Practicum	2	11948	Open	ARR	ARR	Summer Session 2
ANAT-D 860 Research	Independent Study	1-10	9049	Open	ARR	ARR	Summer Session 2
ANAT-D 860 Research	Independent Study	1-10	9050	Open	ARR	ARR	Summer Session 1
ANAT-D 878 Anatomy Teaching Practicum	Practicum	2	10288	Open	ARR	ARR	Summer Session 1

ANAT-D 700 Educational Research Practicum

2 Credits.

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

ANAT-D 860 Research

1-10 Credits.

ANAT-D 878 Anatomy Teaching Practicum

2 Credits.

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.

Biology

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
BIOL-T 571 Introductory Biochemistry	Lecture Online	3	12880	Open	ARR	ARR	Online Eight Week 100% Online Taught By IU East June 7 – July 31
BIOL-T 577 Molecular Genetics and Genomes	Lecture Online	3	14889	Open	ARR	ARR	Online Eight Week Class Meets 100% Online Through Asynchronous Instruction 100% Online Class Taught By IU Bloomington
BIOL-T 585 Model Organisms in Research	Lecture Online	3	12184	Open	ARR	ARR	Online Eight Week 100% Online Taught By IUPUI
BIOL-T 592 Social Implications of Biology	Lecture Online	3	13851	Open	ARR	ARR	Online Summer Session 1 100% Online Taught By IU Northwest
BIOL- 59500 Special Assignments-Purdue	Lecture Online	1-4	9060	Open	ARR	ARR	Summer Session 1 This is a 100% Online Delivered Class. No On-campus or Synchronous Class Meetings Are Required
BIOL- 59500 Special Assignments-Purdue	Independent Study	3	9061	Open	ARR	ARR	Summer Session 2
BIOL- 59500 Special Assignments-Purdue	Independent Study	3	10047	Open	ARR	ARR	Summer Session 2
BIOL- 59500 Special Assignments-Purdue	Independent Study	3	10048	Open	ARR	ARR	Summer Session 2
BIOL- 59500 Special Assignments-Purdue	Independent Study	1-4	12006	Open	ARR	ARR	Summer Session 2
BIOL- 59500 Special Assignments-Purdue	Independent Study	3	11326	Open	ARR	ARR	Summer Session 1
BIOL- 59500 Special Assignments-Purdue	Independent Study	1-4	12005	Open	ARR	ARR	Summer Session 1
BIOL-69600 Seminar	Seminar Online	1	9062	Open	ARR	ARR	Summer Session 1 This is a 100% Online Delivered Class. No On-

							campus or Synchronous Class Meetings Are Required
BIOL-69600 Seminar	Seminar Online	1	9063	Open	ARR	ARR	Summer Session 2 This is a 100% Online Delivered Class. No On-campus or Synchronous Class Meetings Are Required
BIOL-69600 Seminar	Seminar Online	1	12295	Open	ARR	ARR	Summer Session 1 This is a 100% Online Delivered Class. No On-campus or Synchronous Class Meetings Are Required
BIOL-69600 Seminar	Seminar Online	1	10692	Open	ARR	ARR	Summer Session 2 This is a 100% Online Delivered Class. No On-campus or Synchronous Class Meetings Are Required

BIOL-T 571 Introductory Biochemistry

3 Credits.

Protein composition and structure, Enzyme kinetics, catalytic and regulatory strategies, Carbohydrates, Nucleic acids, Lipids and cell membranes, Transducing and storing energy - metabolic cycles, Responding to environmental changes.

BIOL-T 577 Molecular Genetics and Genomes

3 Credits.

This course provides an overview of modern DNA sequencing technologies, which can produce trillions of base pairs per day, and how they are applied to determine genome sequences, RNA levels and processing, the positions DNA and RNA binding proteins, and even the 3-dimensional arrangement of DNA inside the nucleus.

BIOL-T 585 Model Organisms in Research

3 Credits.

Students will be introduced to the evolutionary similarities that allow study of human disease in certain organisms and the differences that limit the conclusions that can be made from that research. Students will be introduced to the history of the use of these organisms and the characteristics that give these organisms the label or 'model' organism. Students will be asked to think critically and be able to evaluate primary sources of research.

BIOL-T 592 Model Organisms in Research

3 Credits.

Biological aspects of social problems such as AIDS, genetic engineering, population explosion, eugenics, drug abuse, heredity, hazards of irradiation, etc.

BIOL- 59500 Special Assignments-Purdue

1-4 Credits.

Special work, such as directed reading, independent study or research, supervised library, laboratory, or field work, or presentation of material not available in the formal courses of the department.

BIOL- 69600 Seminar

1 Credit.

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.

Chemistry and Chemical Biology

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
CHEM-59900 Special Assignment	Independent Study	1-4	9159	Open	ARR	ARR	Summer Session 1 Must Complete Arrangements Prior To Registration

CHEM-59900 Special Assignment	Independent Study	1-4	9160	Open	ARR	ARR	Summer Session 2
CHEM-59900 Special Assignment	Independent Study	1-4	10111	Open	ARR	ARR	Summer Session 1
CHEM-59900 Special Assignment	Independent Study	1-4	10682	Open	ARR	ARR	Summer Session 2
CHEM-59900 Special Assignment	Independent Study	1-4	10113	Open	ARR	ARR	Summer Session 2
CHEM-59900 Special Assignment	Independent Study	1-4	10916	Open	ARR	ARR	Regular Academic Session
CHEM-59900 Special Assignment	Independent Study	1-4	11023	Open	ARR	ARR	Summer Session 2

CHEM-59900 Special Assignment

1-4 Credits.

Directed reading or special work not included in other courses.

IU Online Chemistry

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
CHEM-T 550 Introductory Biochemistry	Online	3	1575	Open	OL	OL	Online Eight Week First June 7 – July 31
CHEM-T 570 Nuclear Chemistry	Online	3	13941	Open	OL	OL	Online Eight Week First June 7 – July 31
CHEM-T 590 Chemistry Capstone	Online	3	1587	Open	OL	OL	Online Eight Week First June 7 – July 31

CHEM-T 550 Introductory Biochemistry

3 Credits.

Protein composition and structure, Enzyme kinetics, catalytic and regulatory strategies, Carbohydrates, Nucleic acids, Lipids and cell membranes, Transducing and storing energy - metabolic cycles, Responding to environmental changes.

CHEM-T 570 Nuclear Chemistry

3 Credits.

The fundamentals of nuclear chemistry and radiochemistry are covered. Topics may include nuclide types (origin, distribution), nuclide stability (quantum structure, binding energy), nuclear reactions (radioactive decay, fusion, fission), applications of nuclear phenomena (nuclear power plants, radioisotope dating, tracers, analytical techniques), and hazards (nuclear power plant accidents, biological effects of radiation).

CHEM-T 590 Chemistry Capstone

Computer Science

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
CSCI-59000 Topics in Computer Science	Independent Study	1-5	9945	Open	ARR	ARR	Regular Academic Session

CSCI- 59000 Topics in Computer Science

1-5 Credits.

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

IU Online Computer Science

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
CSCI-C 590 Special Topics in Computer Science	Online	3	14706	Open	OL	OL	Summer Session 1 Week First May 17 – June 28

CSCI-C 590 Special Topics in Computer Science

3 Credits

Geology

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
GEOL-G 700 Geologic Problems	Independent Study	1-5	9287	Open	ARR	ARR	Summer Session 1
GEOL-G 700 Geologic Problems	Independent Study	1-5	10289	Open	ARR	ARR	Summer Session 1
GEOL-G 700 Geologic Problems	Independent Study	1-5	10290	Open	ARR	ARR	Summer Session 1
GEOL-G 700 Geologic Problems	Independent Study	1-5	10291	Open	ARR	ARR	Summer Session 1
GEOL-G 700 Geologic Problems	Independent Study	1-5	10292	Open	ARR	ARR	Summer Session 1
GEOL-G 700 Geologic Problems	Independent Study	1-5	9288	Open	ARR	ARR	Summer Session 2

GEOL-G 700 Geologic Problems

1-5 Credits.

Consideration of special geological problems.

Mathematics

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE

MATH-51100 Linear Algebra with Applications	Online Lecture	3	9336	Open	ARR	ARR	Summer Session 1 This is a 100% Online Delivered Class. No On-campus or Synchronous Class Meetings are Required
Math-54700 Analysis For Teachers	Online Lecture	3	13017	Open	5:00 p.m. – 7:15 p.m.	MWR	Summer Session 2 This is a Synchronous Distance Course. Instruction Will Take Place Online at the Specific Times/Days Listed in the Class Details. No On-Campus Meetings are Required.
Math-58300 History of Elementary Math	Online Lecture	3	13016	Open	5:00 p.m. – 7:15 p.m.	MWR	Summer Session 1 Before registering, student must contact individual math professor for course requirements and department permission.
Math-59800 Topics in Math	Independent Study	0-6	9337	Open	ARR	ARR	Summer Session 1 Before registering, student must contact individual math professor for course

							requirements and department permission.
Math-59800 Topics in Math	Independent Study	0-6	9338	Open	ARR	ARR	Summer Session 2 Before registering, student must contact individual math professor for course requirements and department permission.

MATH-51100 Linear Algebra with Applications

3 Credits.

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; Jordon canonical form, quadratic forms.

MATH-54700 Analysis for Teachers

3 Credits.

Inequalities, sequences, functions, limits. Application to such basic concepts as length and area and their implications for the teacher of mathematics.

MATH- 58300 History of Elementary Math

3 Credits.

A survey of elementary mathematics before calculus. An effort will be made to link the history of mathematics to that of other sciences and to the social history of the relevant periods. Some acquaintance with ancient or medieval history of Europe is desirable.

MATH- 59800 Topics in Math

0-6 Credits.

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

IU ONLINE MATH

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
MATH-M 505 Basic Number Theory	Online	3	2701	Open	OL	OL	Non Standard Session 1 South Bend May 31 – July 23
MATH- T 601 Topics in Algebra	Online	3	12950	Open	OL	OL	Online Eight Week South Bend June 7 – July 31
MATH-T 620 Topics in Topology/Geometry	Online	3	13734	Open	OL	OL	Online Eight Week First June 7 – July 31
MATH-T 650 Topics in Probability	Online	3	12946	Open	OL	OL	Online Eight Week First June 7 – July 31

Math-M 505 Basic Number Theory 1

3 Credits.

Congruencies, unites modulo n, lattices and abelian groups, quadratic residues, arithmetic functions, Diophantine equations, Farey fractions, continued fractions, partition function, the Sieve method, density of subsets of integers, c-function, the prime number theorem.

MATH-T 601 Topics in Algebra

3 Credits.

This course will cover core topics in Algebra, including Group Theory, Ring Theory, Field Theory, Commutative and Noncommutative Algebra,

Number Theory, and other topics in Algebra.

MATH-T 620 Topics in Topology/Geometry

3 Credits.

MATH-T 650 Topics in Probability/Statistics

3 Credits.

This course will cover graduate-level knowledge of key concepts of Probability/Statistics.

Physiology

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
PHYSL-F 595 Advanced Physiology	Independent Study	1-15	9376	Open	ARR	ARR	Regular Academic Session
PHYSL-F 595 Advanced Physiology	Independent Study	1-15	14299	Open	ARR	ARR	Summer Session 1
PHYSL-F 595 Advanced Physiology	Independent Study	1-15	14300	Open	ARR	ARR	Summer Session 2
PHYSL-F 701 Research in Physiology	Independent Study	1-15	12087	Open	ARR	ARR	Regular Academic Session
PHYSL-F 701 Research in Physiology	Independent Study	1-15	14301	Open	ARR	ARR	Summer Session 1
PHYSL-F 701 Research in Physiology	Independent Study	1-15	14302	Open	ARR	ARR	Summer Session 2
PHSL-F 702 SEMINAR IN PHYSIOLOGY	Seminar Hybrid-On Campus & Online	1	11801	Open	ARR	ARR	Regular Academic Session
PHSL-F 702 SEMINAR IN PHYSIOLOGY	Seminar Hybrid-On Campus & Online	1	14305	Open	ARR	ARR	Summer Session 1
PHSL-F 702 SEMINAR IN PHYSIOLOGY	Seminar Hybrid-On	1	14306	Open	ARR	ARR	Summer Session 2

	Campus & Online						
PHSL-F 780 Special Topics in Physiology	Independent Study	1-24	11582	Open	ARR	ARR	Regular Academic Session

PHSL-F 595 Advanced Physiology

1-15 Credits.

PHSL-F 701 Research in Physiology

1-15 Credits.

PHSL-F 702 Seminar in Physiology

1 Credits.

PHSL-F 780 Special Topics in Physiology

1-24 Credits.

Physics

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
PHYS-59000 Reading and Research	Independent Study	1-3	9398	Open	ARR	ARR	Summer Session 1
PHYS-59000 Reading and Research	Independent Study	1-3	9399	Open	ARR	ARR	Summer Session 2
PHYS-59000 Reading and Research	Independent Study	6	11778	Open	ARR	ARR	Regular Academic Session
PHYS-59000 Reading and Research	Independent Study	2	11779	Open	ARR	ARR	Regular Academic Session

PHYS- 59000 Reading and Research

1-6 Credits.

Reading and research in Physics.

Statistics

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
STAT-51500 Statistical Consulting Problems	Independent Study	1	9473	Open	ARR	ARR	Summer Session 1
STAT-51500 Statistical Consulting Problems	Independent Study	1-3	9474	Open	ARR	ARR	Summer Session 2
STAT-59800 Topics in Statistical Methods	Independent Study	1-3	9475	Open	ARR	ARR	Summer Session 1
STAT-59800 Topics in Statistical Methods	Independent Study	1-3	9476	Open	ARR	ARR	Summer Session 2

STAT- 51500 Statistical Consulting Problems

1-3 Credits.

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

STAT- 59800 Topics in Statistical Methods

1-3 Credits.

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

TECHNOLOGY

TITLE	COMPONENT	CREDITS	CLASS	STATUS	TIME	DAY	ATTRIBUTE
TECH 58100 Workshop in Technology	Online	1-3	14291	Open	ARR	ARR	Regular Academic Session May 11 – August 9

TECH 58100 Workshop in Technology

1-3 Credits.

Advanced study in various fields of technology.