

HOOOSIER

STEM

SCIENCE
TECHNOLOGY
ENGINEERING
MATHEMATICS

ACADEMY



Course Catalogue Purdue Summer 2021



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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. Upon completion of a 3 credit course with a grade of C or higher, participants will receive a \$1,400 stipend to help cover the cost of tuition, fees, and/or materials.

The Hoosier STEM Academy is now launching the Fall 2021 course catalogue. Instructions 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 18 hours in a content area 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 will count toward the dual credit credentials.

Application Process

1. For those wanting to complete a course or courses at the **post-baccalaureate, non-degree status:**

- A. Complete the Graduate School online admission application [here](#).
- B. There is no application fee for non-degree applicants.
- C. Upload evidence of a baccalaureate degree. This may be a transcript, a copy of the diploma, or a letter from the college or university verifying the degree.
- D. Once you are admitted by the Graduate School and view your admission letter, you will be sent instructions by email for setting up your [myPurdue account](#) in order to register for classes.

For those wanting to complete for a **graduate degree:**

- A. Complete the Graduate School online admission application [here](#). View Degrees and Programs [here](#). Choose up to 3 graduate majors in priority order.

Program application deadlines vary, so be sure to check with your program of interest to determine its deadline. For specific program deadlines, click [here](#).

B. Pay the \$60.00 nonrefundable application fee. Visa, Mastercard, Discover, and American cards are accepted.

C. Required application documents:

- i. Although the Graduate Record Examination (GRE) is not a Graduate School requirement, many graduate programs require this test. Check your program to see if they require GRE test scores [here](#).
- ii. Official transcripts for every institution of higher education attended
- iii. Statement of purpose
- iv. Three letters of recommendation

D. Once you are admitted officially by the Graduate School and view your online admission decision letter, you will be sent instructions by email for setting up your [myPurdue account](#) in order to register for classes. Your registration PIN is 999999 for any session. Complete a

For those who have already been admitted into the College of Education **as a post-baccalaureate, non-degree graduate student and have taken a course or courses within the past three sessions**, do not submit another application:

- A. Access your [myPurdue account](#) to register for classes. Your registration PIN is 999999.
- B. Please note up to twelve hours taken at this status may be considered for an advanced degree (subject to approval by your major professor, committee, department, and university).

Questions

Please contact Kizmin M. Jones with questions:

Purdue University Courses

Biochemistry

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
27331	BCHM	56100	001	West Lafayette	3	General Biochemistry I	MWF	5:30 p.m. – 6:20 p.m.	Upper Division

BCHM 56100- General Biochemistry I

Credit Hours: 3.00. This course provides upper-division undergraduate and graduate students with basic understanding of biochemical and structural properties of amino acids, nucleic acids, lipids, and carbohydrates. This course allows students to connect the relationship between structure and function of biomolecules. In addition, students learn to understand enzyme properties, enzyme mechanism of action, and enzyme regulation. Typically offered Fall.

3.000 Credit hours

Biological Sciences

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
23313	BIOL	59500	034	West Lafayette	3	Water Supply in Developing Countries	T	5:30 p.m. – 7:20 p.m.	Variable Title, Upper Division
12514	BIOL	69100	001	West Lafayette	1	Biological Research Methods	TBA	TBA	
21242	BIOL	69100	002	West Lafayette	1	Biological Research Methods	TBA	TBA	

19953	BIOL	69600	015	West Lafayette	1	Seminar	TBA	TBA	Variable Title
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BIOL 59500- Water Supply in Dev Countries

Credit Hours: 0.00 to 18.00. 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. The field in which work is offered will be indicated in the student's record. Permission of instructor required. Typically offered Fall Spring Summer.

0.000 TO 18.000 Credit hours

BIOL 69100- Biological Research Methods

Credit Hours: 1.00. Open to graduate students in the Department of Biological Sciences and designed primarily for students in their first year of graduate study. The course consists of two laboratory assignments, each of which lasts about two months. Students may take one or two of these per semester. During each laboratory assignment, the student will be exposed to methods, equipment, and experimental procedures currently in use in a particular departmental research laboratory selected by the student and through arrangement with the professor in charge of that laboratory.

Admission by consent of the departmental Graduate and Advanced Studies Committee. Typically offered Fall Spring Summer.

1.000 Credit hours

BIOL 69600- Seminar

Credit Hours: 1.00. 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. The student's record will indicate the specific seminars in which he/she has participated. Oral presentations required. At least two credits are required of Ph.D. candidates. Typically offered Fall Spring.

0.000 OR 1.000 Credit hours

Chemistry

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
46324	CHM	50200	002	West Lafayette	0-3	Modern Chemistry in the High School	MW	4:30 p.m. – 5:45 p.m.	Upper Division
14492	CHM	59900	001	West Lafayette	1-4	Special Assignments	TBA	TBA	Variable Title, Upper Division
14512	CHM	69500	005	West Lafayette	0-1	Sem Organic Chem	T	4:30 p.m. – 5:20 p.m.	Variable Title

CHM 50200- Modern Chemistry in the High School

Credit Hours: 3.00. A critical discussion of the means by which the fundamentals of modern chemistry can best be introduced at the high school level. The laboratory will deal with the manufacture and use of lecture demonstration equipment, the use of films and film strips, and the problems involved in organizing and running a high school chemical laboratory.

Typically offered Spring.

0.000 OR 3.000 Credit hours

CHM 59900- Special Assignments

Credit Hours: 1.00 to 4.00. Directed reading or special work not included in other courses. Permission of instructor required. Typically offered Fall Spring Summer.

0.000 TO 4.000 Credit hours

CHM 69500- Seminar

Credit Hours: 0.00 or 1.00. Groups 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 or her major subject. Typically offered Fall Spring Summer.
0.000 OR 1.000 Credit hours

Computer Sciences

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
46551	CS	51400	LE1	West Lafayette	3	Numerical Analysis	TR	4:30 p.m. – 5:45 p.m.	Upper Division
13117	CS	51500	EPE	West Lafayette	3	Numerical Linear Algebra	OL	OL	Upper Division, Online
27471	CS	51500	OXE	West Lafayette	3	Numerical Linear Algebra	OL	OL	Upper Division, Online
13240	CS	52900	LE1	West Lafayette	3	Security Analytics	MW	4:30 p.m. – 5:45 p.m.	Upper Division
13124	CS	54100	EPE	West Lafayette	3	Database Systems	OL	OL	Upper Division, Online
27473	CS	54100	OXE	West Lafayette	3	Database Systems	OL	OL	Upper Division, Online
11534	CS	57300	LE1	West Lafayette	3	Data Mining	MW	4:30 p.m. – 5:45 p.m.	

27444	CS	57800	EPE	West Lafayette	3	Statistical Machine Learning	OL	OL	Upper Division, Online
27474	CS	57800	OXE	West Lafayette	3	Statistical Machine Learning	OL	OL	Upper Division, Online
34240	CS	59100	SEC	West Lafayette	1	CERIAS Security Seminar	W	4:30 p.m. – 5:20 p.m.	Variable Title, Upper Division
26877	CS	59200	ADS	West Lafayette	3	Advanced Distributed Systems	TR	4:30 p.m. – 5:45 p.m.	Variable Title, Upper Division
26602	CS	59200	AIS	West Lafayette	3	AI for Scientific Discovery	MW	4:30 p.m. – 5:45 p.m.	Variable Title, Upper Division
26602	CS	59200	AIS	West Lafayette	3	AI for Scientific Discovery	MW	4:30 p.m. – 5:45 p.m.	Variable Title, Upper Division
27441	CS	59200	HLT	West Lafayette	3	Hands-On Learning Theory	TR	4:30 p.m. – 5:45 p.m.	Variable Title, Upper Division
27435	CS	59200	MML	West Lafayette	3	Methods of Machine Learning	MW	4:30 p.m. – 5:45 p.m.	Variable Title, Upper Division

CS 51400- Numerical Analysis

Credit Hours: 3.00. (MA 51400) Alternative methods for solving nonlinear equations; linear difference equations, applications to solution of polynomial equations; differentiation and integration formulas; numerical solution of ordinary differential equations; roundoff error bounds. Typically offered Fall. 3.000 Credit hours

CS 51500- Numerical Linear Algebra

Credit Hours: 3.00. Direct and iterative solvers of dense and sparse linear systems of equations, numerical schemes for handling symmetric algebraic eigenvalue problems, and the singular-value decomposition and its applications in linear least squares problems. Typically offered Spring. 3.000 Credit hours

CS 52900- Security Analytics

Credit Hours: 3.00. This course focuses on applied data mining, machine learning, data analytics techniques, and their application and relevance in information security. The course covers basic concepts of data mining and machine learning, computation platforms in support of big data analytics including Map-Reduce and Spark, machine learning algorithms such as classification trees, logistic regression, naive Bayes, k Nearest Neighbors, Support Vector Machines, Artificial Neural Networks (including Feed Forward, Convolutional, and Recurrence), the application of these algorithms to security tasks such as Spam/Phishing detection, malware detection, intrusion detection, and situational awareness. The future and potential role of applying machine learning techniques in information and data security is explored. Typically offered Fall. 3.000 Credit hours

CS 54100- Database Systems

Credit Hours: 3.00. Fundamentals for the logical design of database systems. The entity-relationship model, semantic model, relational model, hierarchical model, network model. Implementations of the models. Design theory for relational databases. Design of query languages and the use of semantics for query optimization. Design and verification of integrity assertions, and security. Introduction to intelligent query processing and database machines. Typically offered Fall. 3.000 Credit hours

CS 57300- Data Mining

Credit Hours: 3.00. (CSCI 57300) Data Mining has emerged at the confluence of artificial intelligence, statistics, and databases as a technique

for automatically discovering summary knowledge in large datasets. This course introduces students to the process and main techniques in data mining, including classification, clustering, and pattern mining approaches. Data mining systems and applications are also covered, along with selected topics in current research. Offered in alternate years. Typically offered Fall.
3.000 Credit hours

CS 57800- Statistical Machine Learning

Credit Hours: 3.00. This introductory course will cover many concepts, models, and algorithms in machine learning. Topics include classical supervised learning (e.g., regression and classification), unsupervised learning (e.g., principle component analysis and K-means), and recent development in the machine learning field such as variational Bayes, expectation propagation, and Gaussian processes. While this course will give students the basic ideas and intuition behind modern machine learning methods, the underlying theme in the course is probabilistic inference. Typically offered Fall.
3.000 Credit hours

CS 59100- CERIAS Security Seminar

Credit Hours: 1.00. A weekly seminar presented by faculty and invited speakers, normally in a specific area. Typically offered Fall Spring.
1.000 Credit hours

CS 59200- Advanced Distributed Systems

Credit Hours: 3.00. A seminar course for in-depth exploration of a specific topic. Topics vary. Classes consist of both instructor and student presentations. Students read, present and discuss research papers, and may complete and present a research project in the area. For each offering, inclusion on a plan of study is determined by the CS Graduate Study Committee. If approved, may be included on a CS MS or PhD plan of study according to relevant ruleset. Typically offered Fall Spring.
3.000 Credit hours

CS 59200- Computer Science Seminar

Credit Hours: 3.00. A seminar course for in-depth exploration of a specific topic. Topics vary. Classes consist of both instructor and student presentations. Students read, present and discuss research papers, and may complete and present a research project in the area. For each offering, inclusion on a plan of study is determined by the CS Graduate Study Committee. If approved, may be included on a CS MS or PhD plan of study according to relevant ruleset. Typically offered Fall Spring.

3.000 Credit hours

Earth, Atmospheric, and Planetary Sciences

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
19005	EAPS	50700	002	West Lafayette	3	Introduction to Analysis and Computing with Geoscience Data	OL	OL	Upper Division
21303	EAPS	50700	003	West Lafayette	3	Introduction to Analysis and Computing with Geoscience Data	OL	OL	Upper Division
24907	EAPS	59100	154	West Lafayette	3	Environmental Data Mdl Assimilation	WF	4:30 p.m. – 5:45 p.m.	Upper Division, Variable Title

EAPS 50700 – Introduction to Analysis and Computing with Geoscience Data

Credit Hours: 3.00. Course teaches computing techniques including error analysis, line and surface fitting, interpolation, map projections, geospatial and temporal correlations, signal processing, and visualization with discussions on specific and practical geoscience applications. Lectures with computer exercises and team project reporting using open-source computer software. Cannot get credit for both EAPS 50900 and EAPS 50700. Typically offered Fall Spring.

0.000 OR 3.000 Credit hours

EAPS 59100- Advanced Topics in Earth and Atmospheric Sciences

Credit Hours: 0.00 to 18.00. Specialized study offered on an individual basis or through specially arranged courses. Permission of instructor required. Typically offered Fall Spring Summer.

0.000 TO 18.000 Credit hours

Engineering Education

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
24329	ENE	50101	EPE	West Lafayette	3	Foundations of Engineering Education	OL	OL	Upper Division, Online
24330	ENE	50200	EPE	West Lafayette	3	History and Philosophy of Engineering Education	OL	OL	Upper Division, Online
24331	ENE	50300	EPE	West Lafayette	3	Engineering Education Inquiry	OL	OL	Upper Division, Online
66730	ENE	59000	001	West Lafayette	1-6	Special Problems in Engineering Education	TBA	TBA	Variable Title
35326	ENE	59000	002	West Lafayette	1-6	Special Problems in Engineering Education	TBA	TBA	Variable Title
24332	ENE	68500	EPE	West Lafayette	3	Educational Methods in Engineering	OL	OL	Online
17614	ENE	68700	001	West Lafayette	1	Mentored Teaching in Engineering	T	4:30 p.m.-5:20 p.m.	

23418	ENE	69000	EPE	West Lafayette	0	Seminar in Engineering Education	OL	OL	Online
24336	ENE	69500	EPE	West Lafayette	3	Succeeding as Engr Professor	OL	OL	Online, Variable Title

ENE 50101- Foundations of Engineering Education

Credit Hours: 3.00. In this course, new doctoral students in engineering education explore their roles within the field of engineering education, create a learning plan that maps to program requirements, and develop habits of mind to support their ongoing professional development. Students learn to write clearly and coherently in an academic context. Students examine research trends and faculty interests so they can make informed choices about advising and program opportunities. Permission of instructor required. Typically offered Fall.

3.000 Credit hours

ENE 50200- History and Philosophy of Engineering Education

Credit Hours: 3.00. Examines the history and philosophy of engineering education by: (1) exploring the history of engineering education through archival research and historical documents (critical moments, tensions, issues); (2) investigating philosophies of education and the philosophies that have guided engineering as a profession; and (3) critiquing the evolution of engineering education, identifying alternative scenarios, and imagining a future role in engineering education. This course introduces students to the field of engineering education while broadening their views of the roles of interrelationships between teaching and research. Open to students in Engineering Education. Permission of instructor required. Typically offered Fall.

3.000 Credit hours

ENE 50300- Engineering Education Inquiry

Credit Hours: 3.00. This course is conceived as a bridge between beginning graduate students' knowledge of technical research and modes of inquiry appropriate to the new field of engineering education. It is designed as the entryway to required research method courses taken as part of the students'

plan of study. By the end of this survey course, students will be able to critique research in terms of the quality of the authors' argument based on their chain of reasoning, and will recognize that the articulation of a research question, the significance of the question, the choice of methods in regards to the research goals, and the transparency of the explanation of the methodology are all the parts of the chain of reasoning. Permission of instructor required. Typically offered Fall.
3.000 Credit hours

ENE 59000- Special Problems in Engineering Education

Credit Hours: 1.00 to 6.00. Project or special topics of contemporary importance or of special interest that are outside the scope of the standard graduate curriculum. Interested students should seek a faculty advisor by meeting individual faculty members who work in their area of special interest and prepare a brief description of the work to be undertaken and expected outcomes and deliverables. An individual project must be approved by the faculty member supervising the project and the student's advisor before registering for the course. An approved written report is required. Permission of instructor required. Typically offered Fall Spring Summer.
1.000 TO 6.000 Credit hours

ENE 68500- Educational Methods in Engineering

Credit Hours: 3.00. (CHE 68500) Students will learn how to teach in an engineering environment where both classroom and laboratory instruction is intertwined. Classroom techniques, such as lectures, cooperative groups, mastery and PSI, TV and video, and guided design will be studied, in addition to class preparation issues, such as ABET accreditation and design content. Students will study motivation, learning theories and cycles, and personality types. Includes teaching practice and group projects. Student must be admitted into a Ph.D. program in Engineering or other technical discipline (Finished with MS or MS-bypass). Not open to students who have taken PSY 69500/EDPS 63400. Permission of Instructor required. Typically offered Fall Spring.
0.000 OR 3.000 Credit hours

ENE 69000- Seminar in Engineering Education

Credit Hours: 0.00. Seminar course covering a broad range of current discovery, learning, and engagement topics in Engineering Education. Seminar presentations by representatives from academia, industry, other external institutions, and members of the Purdue University community. This is a required course for the graduate program in the Department of Engineering Education. Typically offered Fall Spring.
0.000 Credit hours

ENE 69500- Succeeding as Engr Professor

Credit Hours: 0.00 to 6.00. Primarily designed for specialized topic areas for which there is no specific course, workshop, or individual study plan, but having enough student interest to justify the formalized teaching of a course. Permission of instructor required. Typically offered Summer Fall Spring.

0.000 TO 6.000 Credit hours

Engineering

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
22609	ENGR	59600	001	West Lafayette	3	Grad ENGR Communications	TBA	TBA	Upper Division, Variable Title
10564	ENGR	69199	001	West Lafayette	0	Professional Practice Graduate Co-Op I	TBA	TBA	Coop, Full Time Privileges

ENGR 59600- Grad ENGR Communications

Credit Hours: 1.00 to 6.00. Special topic courses for projects or special interest in Engineering. Typically offered Fall Spring Summer.

1.000 TO 6.000 Credit hours

ENGR 69199- Professional Practice Graduate Co-Op I

Credit Hours: 0.00. Graduate cooperative education experience. Program coordinated by the Office of Professional Practice with cooperation from academic disciplines and participating employers. Students submit technical report and company evaluation. Permission of Instructor required. Typically offered Fall Spring Summer.

0.000 Credit hours

Forestry and Natural Resources

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
17061	FNR	59800	001	West Lafayette	1	Grad Intro Teach Nat Resources	TBA	TBA	Upper Division, Variable Title
24509	FNR	59800	002	West Lafayette	3	Adv Spatial Ecology and GIS	TBA	TBA	Upper Division, Variable Title
24511	FNR	59800	003	West Lafayette	3	Adv Fish and Marine Pop Dynamics	TBA	TBA	Upper Division, Variable Title
24912	FNR	59800	006	West Lafayette	2	Undergrad Intro Teach Nat Resources	TBA	TBA	Upper Division, Variable Title
24980	FNR	59800	008	West Lafayette	3	Adv Sustainable Wood Prof Mfg	TBA	TBA	Upper Division, Variable Title
24989	FNR	59800	009	West Lafayette	3	Adv Sustainable Furn Cnc Mfg	TBA	TBA	Upper Division, Variable Title
26910	FNR	59800	011	West Lafayette	3	Grad Vertebrate Pop Dynamics	TBA	TBA	Upper Division, Variable Title

FNR 5800- Topical Problems in Forestry and Natural Resources

Credit Hours: 1.00 to 3.00. Subjects and problems of interest to the student. Permission of instructor required. Typically offered Fall Spring Summer. 0.000 TO 3.000 Credit hours

Mathematics

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
23387	MA	51400	001	West Lafayette	3	Numerical Analysis	TR	4:30 p.m. – 5:45 p.m.	Upper Division
24892	MA	52700	EPE	West Lafayette	3	Advanced Mathematics for Engineers and Physicists I	TBA	TBA	Upper Division, Online
12919	MA	52700	ONC	West Lafayette	3	Advanced Mathematics for Engineers and Physicists I	TBA	TBA	Upper Division, Online
23430	MA	59800	503	West Lafayette	1	Abstract Algebra Problem Session	T	4:30 pm. – 5:20 p.m.	Variable Title, Upper Division
63567	MA	59800	504	West Lafayette	1	Real Analysis Problem Session	R	4:30 pm. – 5:20 p.m.	Variable Title, Upper Division
22510	MA	59800	511	West Lafayette	1	CCAM Seminar	M	4:30 pm. – 5:20 p.m.	Variable Title, Upper Division

22289	MA	59800	528	West Lafayette	3	Introduction to Schemes	M	4:30 pm. – 5:45 p.m.	Variable Title, Upper Division
26204	MA	59800	531	West Lafayette	3	Hodge Theory	TBA	TBA	Variable Title, Upper Division
26472	MA	59800	532	West Lafayette	3	Algebraic Number Theory	TBA	TBA	Variable Title, Upper Division
27462	MA	59800	533	West Lafayette	3	Topics Computational Imaging	TBA	TBA	Variable Title, Upper Division
12280	MA	59800	BR2	West Lafayette	1	Bridge to Research Seminar	M	4:30 pm. – 5:20 p.m.	Variable Title, Upper Division
18114	MA	59800	STU	West Lafayette	1	Student Colloquium	W	4:30 pm. – 5:20 p.m.	Variable Title, Upper Division
18340	MA	65000	001	West Lafayette	3	Commutative Algebra	MWF	4:30 pm. – 5:20 p.m.	

MA 51400- Numerical Analysis

Credit Hours: 3.00. (CS 51400) Iterative methods for solving nonlinear; linear difference equations, applications to solution of polynomial equations; differentiation and integration formulas; numerical solution of ordinary differential equations; roundoff error bounds. Typically offered Fall Spring. 3.000 Credit hours

MA 52700- Advanced Mathematics for Engineers and Physicists I

Credit Hours: 3.00. MA 52700 is not a prerequisite for MA 52800; these courses can be taken independently. Topics in MA 52700 include linear

algebra, systems of ordinary differential equations, Laplace transforms, Fourier series and transforms, and partial differential equations. MA 51100 is recommended. Typically offered Fall.
3.000 Credit hours

MA 59800- Topics in Mathematics

Credit Hours: 1.00 to 5.00. Supervised reading courses as well as dual-level special topics courses are given under this number. Permission of instructor required. Typically offered Fall Spring Summer.
1.000 TO 5.000 Credit hours

MA 65000- Commutative Algebra

Credit Hours: 3.00. The study of those rings of importance in algebraic and analytic geometry and algebraic number theory. Prerequisite: MA 55800. Typically offered Fall Spring Summer.
3.000 Credit hours

Physics

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAY S	TIME	ATTRIBUTE
47794	PHYS	57000	005	West Lafayette	0	Tch Erth Phys Sci Sec	MW	4:30 p.m. – 5:45 p.m.	Upper Division, Variable Title
16679	PHYS	59000	002	West Lafayette	3	Sustain Energy Src 21 st Cent	TBA	TBA	Upper Division, Variable Title
24675	PHYS	59000	003	West Lafayette	0-6	Research with the CMS Detector	TBA	TBA	Upper Division, Variable Title
24679	PHYS	59000	004	West Lafayette	0-6	Dark Matter Research	TBA	TBA	Upper Division, Variable Title
69161	PHYS	59500	001	West Lafayette	1-3	Instructional Design in Physical Science	TBA	TBA	Upper Division

PHYS 57000- Selected Topics in Physics

Credit Hours: 3.00. Specialized topics in physics selected from time to time. Permission of instructor required. Typically offered Fall Spring Summer.
0.000 OR 3.000 Credit hours

PHYS 59000- Reading and Research

Credit Hours: 1.00 to 3.00. (Calumet, Fort Wayne) 1.00 to 6.00 (West Lafayette, IUPUI). Reading and research in Physics. Permission of instructor required. Typically offered Fall Spring Summer.
0.000 TO 6.000 Credit hours

PHYS 59500- Instructional Design in Physical Science

Credit Hours: 1.00 to 3.00. This course builds on collaborative interactions among current Purdue Physics or Education students, K-12 science educators, Physics and Purdue College of Science faculty, and Physics Outreach. The goal for this course is to provide opportunities and mentorship for independent work that could include the design, piloting, and assessment of instructional materials, relevant to learning and teaching topics and concepts related to the physical sciences. With a service learning orientation, students enrolled in this course should expect to learn and build upon the fundamental principles related to the design and implementation of instructional materials in classroom or informal learning environments, and assessment of learning. Materials developed could contribute to the repertoire of practicing teachers and/or Physics Outreach. Typically offered Fall Spring.
1.000 TO 3.000 Credit hours

Statistics

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAY S	TIME	ATTRIBUTE
65120	STAT	50300	008	West Lafayette	3	Statistical Methods for Biology	OL	OL	Upper Division Distance Learning
34237	STAT	51100	003	West Lafayette	3	Statistical Methods	TR	4:30 p.m. – 5:45 p.m.	Upper Division

17275	STAT	51200	014	West Lafayette	3	Applied Regression Analysis	OL	OL	Upper Division Online
16777	STAT	51300	EPE	West Lafayette	3	Statistical Quality Control	TBA	TBA	Upper Division Online
25364	STAT	51300	OXE	West Lafayette	3	Statistical Quality Control	TBA	TBA	Upper Division Online
14927	STAT	51600	EPE	West Lafayette	3	Basic Probability and Applications	OL	OL	Upper Division Online
63551	STAT	59800	019	West Lafayette	1	Explore Stat Sci Research	W	4:30 p.m. – 5:20 p.m.	Variable Title, Upper Division, Dept Credit
69200	STAT	69200	002	West Lafayette	0	Statistics Seminar	R	4:30 p.m. – 5:20 p.m.	

STAT 50300- Statistical Methods for Biology

Credit Hours: 3.00. Introductory statistical methods, with emphasis on applications in biology. Topics include descriptive statistics, binomial and normal distributions, confidence interval estimation, hypothesis testing, analysis of variance, introduction to nonparametric testing, linear regression and correlation, goodness-of-fit tests, and contingency tables. Open only to majors related to the life sciences. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, STAT 35000, STAT 50100, and in no more than one of STAT 50300 and STAT 51100. Typically offered Fall Spring Summer.

3.000 Credit hours

STAT 51100- Statistical Methods

Credit Hours: 3.00. Descriptive statistics; elementary probability; sampling distributions; inference, testing hypotheses, and estimation; normal,

binomial, Poisson, hypergeometric distributions; one-way analysis of variance; contingency tables; regression. For statistics majors and minors, credit should be allowed in no more than one of STAT 30100, STAT 35000, STAT 50100, and in no more than one of STAT 50300 and STAT 51100. Prerequisite: Two semesters of college calculus. Typically offered Fall Spring.
3.000 Credit hours

STAT 51200- Applied Regression Analysis

Credit Hours: 3.00. 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. Prerequisite: Coursework in Statistical Methods with a calculus prerequisite. Typically offered Fall Spring Summer.
0.000 OR 3.000 Credit hours

STAT 51300- Statistical Quality Control

Credit Hours: 3.00. A strong background in control charts including adaptations, acceptance sampling for attributes and variables data, standard acceptance plans, sequential analysis, statistics of combinations, moments and probability distributions, applications.
3.000 Credit hours

STAT 51600- Basic Probability and Applications

Credit Hours: 3.00. 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. (The probability material in course one of the Society of Actuaries and the Casualty Actuarial Society is covered by this course.) Typically offered Fall Spring.
3.000 Credit hours

STAT 59800- Topics in Statistical Methods

Credit Hours: 0.00 to 6.00. (West Lafayette, IUPUI) 1.00 to 3.00 (North Central) Directed study and reports for students who wish to undertake individual reading and study on approved topics. Permission of instructor required. Typically offered Fall Spring Summer.
0.000 TO 6.000 Credit hours

STAT 69200- Statistics Seminar

Credit Hours: 1.00. A colloquium or seminar course with discussion. Colloquium speakers present current technical results from statistics. A discussion follows in which the speaker and instructor take questions and explain issues in detail. Students give reports on lectures. Permission of department required. Typically offered Fall Spring.
0.000 OR 1.000 Credit hours

Technology

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
53721	TECH	58100	002	West Lafayette	2	Tech Realization Seminar	M OL	4:30 p.m. – 6:20 p.m. OL	Honors, Variable Title, Upper Division, Synchronous Online
64557	TECH	62100	025	West Lafayette	3	Energy Technology & Applications	OL	OL	Variable Title, Online
23807	TECH	64600	008	West Lafayette	3	Analysis of Research in Industry and Technology	OL	OL	Online

TECH 58100- Tech Realization Seminar

Credit Hours: 0.00 to 8.00. Advanced study of technical and professional topics. Emphasis is on new developments relating to technical, operational, and training aspects of industry and technology education. Typically offered Fall Spring Summer.
0.000 TO 8.000 Credit hours

TECH 62100- Energy Technology & Applications

Credit Hours: 1.00 to 3.00. Current problems in Technology. Typically offered Fall Spring Summer.
0.000 TO 3.000 Credit hours

TECH 64600- Analysis of Research in Industry and Technology

Credit Hours: 3.00. Analysis of research and evaluation of research reports. Emphasis on understanding the application of fundamental statistical methods in design and interpretation of research findings in industrial, technical, and human resource development environments. Prerequisite: Master's student standing. Typically offered Fall Spring Summer.
0.000 OR 3.000 Credit hours