HOOSIER STEM ACADEMY

SCIENCE
TECHNOLOGY
ENGINEERING
MATHEMATICS

Course Catalogue Purdue
Fall 2020

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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 higher, participants will receive a $1,375 stipend to help cover the cost of tuition, fees, and/or materials.

The Hoosier STEM Academy is now launching the Fall 2020 course catalog. 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 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 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 at www.purdue.edu/gradschool/admissions/how/index.html

B. There is no application fee for non-degree applicants.

C. Some form of paperwork showing that you have a bachelor's degree; e.g., copy of teacher's license, diploma, or official transcripts, is required via the application.

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 (https://mypurdue.purdue.edu) in order to register for classes.

For those wanting to complete for a **graduate degree**:
A. Complete the Graduate School online admission application at www.purdue.edu/gradschool/admissions/how/index.html. View Degrees and Programs on the Office of Graduate Studies web site at http://www.education.purdue.edu/gradoffice/

B. Pay the $60.00 application fee.

C. Required application documents:
i. official GRE test scores (less than 5 years old) **IF** bachelor's or master's overall GPA at time of graduation is below 3.0/4.0
ii. Official transcripts of grades from all universities 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 (https://mypurdue.purdue.edu) in order to register for classes. Your registration PIN is 999999 for any session. Complete a Course Request Form 23 (available in Beering 3229) for any courses that are variable credit or require instructor permission to register. Return the form to Beering 3229.

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 (https://mypurdue.purdue.edu) to register for classes. Your registration PIN is 999999. Complete a Course Request Form 23 (available in Beering 3229) for any courses that are variable credit or require instructor permission to register. Return the form to Beering 3229.
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).

Beering Hall of Liberal Arts and Education, Room 3229 100 North University Street, West Lafayette, IN 47907-2098
education-gradoffice@purdue.edu; (765) 494-2345, Fax (765) 494-0587
http://www.education.purdue.edu/gr

Questions

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

Purdue University Courses

Animal Sciences

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
18422	ANSC	59500	006	West Lafayette	0-3	Special Topics in Animal Sciences	TBA	TBA	Upper Division, Variable Title
22178	ANSC	59500	007	West Lafayette	3	Quantitative Genomics Breeding	TR	3:00 p.m. – 4:15 p.m.	Upper Division, Variable Title
24918	ANSC	59500	008	West Lafayette	3	Animal Welfare	TBA	TBA	Upper Division, Variable Title
19954	ANSC	66000	001	West Lafayette	1	Intestinal Microbiology and Immunology	W	4:00 p.m.-4:50 p.m.	
10985	ANSC	69100	001	West Lafayette	1-4	Topical Research Problems	TBA	TBA	Variable Title
25133	ANSC	69100	002	West Lafayette	2	Literature Review of Lactation	TBA	TBA	Variable Title

ANSC 59500 – Special Topics in Animal Sciences

Lecture presentation of specialized material not available in the formal courses of the department. The specific topic offered is indicated on the student's record. Permission of instructor required. Typically offered Fall Spring Summer.
0.000 TO 3.000 Credit hours

ANSC 66000- Intestinal Microbiology and Immunology

Credit Hours: 1.00. (FS 66000) Discussion and critique of recent journal articles related to intestinal microbiology/immunology. The specific areas covered under this forum are: (1) intestinal microbiology, (2) food microbiology as it relates to gastrointestinal diseases, (3) probiotics and prebiotics-related to intestinal health or pathogen control, and (4) mucosal immunity with major emphasis on intestinal immunology. Typically offered Fall.
1.000 Credit hours

ANSC 69100 – Topical Research Problems

To be arranged with individual staff members prior to registration. Requires approval of the department head. Supervised individual research projects. Written reports required.

Permission of instructor required. Typically offered Fall Spring Summer.
1.000 TO 4.000 Credit hours

Biochemistry

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
16850	BCHM	60300	001	West Lafayette	6	Introduction to Graduate Research in Biochemistry I	TBA	TBA	
16858	BCHM	60300	002	West Lafayette	6	Introduction to Graduate Research in Biochemistry I	TBA	TBA	

BCHM 60300 - Introduction to Graduate Research in Biochemistry I
Credit Hours: 6.00. This course is intended to provide the opportunity for in-depth, mentored graduate research in two biochemistry laboratories. Students enrolled in this course will learn how to devise hypothesis, design experiments that test their hypotheses, accurately record their data in laboratory notebooks, critically analyze the results of their analyses and present their findings to others in written and oral presentations. They will fully participate in laboratory group meetings, the Biochemistry seminar series, and presentations by other students and postdoctoral fellow. Co-requisites: BCHM 60100 and BCHM 60501. Permission of department required. Typically offered Fall.
0.000 OR 6.000 Credit hours

Biological Sciences

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
21579	BIOL	53700	001	West Lafayette	3	Immunobiology	TR	3:00 p.m. – 4:15 p.m.	Upper Division
23313	BIOL	59500	034	West Lafayette	1	Water Supply in Dev Countries	T	5:30 p.m. – 7:20 p.m.	Upper Division, Variable Title
24865	BIOL	59500	035	West Lafayette	3	Avian Hearing	TBA	TBA	Upper Division, Variable Title
25437	BIOL	59500	036	West Lafayette	3	Bio Techg Secondary Schl	TBA	TBA	Upper Division, Variable Title
20329	BIOL	65200	001	West Lafayette	1	Advanced Ecology Discussion	M	3:30 p.m.-	

								4:20 p.m.	
12514	BIOL	69100	001	West Lafayette	1	Biological Research Methods	TBA	TBA	
21242	BIOL	69100	002	West Lafayette	1	Biological Research Methods	TBA	TBA	
18863	BIOL	69500	003	West Lafayette	2	Intro in Research in EEB	TBA	TBA	Variable Title
21214	BIOL	69500	015	West Lafayette	3	Synthesizing Concepts in EEB	TBA	TBA	Variable Title
13383	BIOL	69600	012	West Lafayette	1	Membrane Protein SuperComplexs	R	4:00 p.m. – 4:50 p.m.	Variable Title
19953	BIOL	69600	015	West Lafayette	1	Crrnt Topcs Glbl Change Ecolgy	TBA	TBA	Variable Title

BIOL 53700 - Immunobiology

Credit Hours: 3.00. Readings and discussion in the structural, cellular, and genetic basis of the immune response. Biology 420 recommended as a pre-requisite. Typically offered Spring.
3.000 Credit hours

BIOL 59500 - Water Supply in Dev Countries

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 65200 – Advanced Ecology Discussion

Credit Hours: 1.00. Weekly meetings to discuss and evaluate seminal papers in the fields of evolutionary, population, and community ecology. During the last week, students will critically evaluate a contemporary paper on a topic related to the "classic" papers discussed during the semester. Students will have a choice among papers submitted by participating faculty members; their critique will be assessed on content, originality, rigor, and clarity. Typically offered Fall.
1.000 Credit hours

BIOL 69100 – Biological Research Methods

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 69500 – Special Assignments

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. Primarily for Ph.D. candidates. Permission of instructor required. Typically offered Fall Spring Summer.
0.000 TO 18.000 Credit hours

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. 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

Botany

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
19862	BTNY	69100	001	West Lafayette	1	Skills for Success in Grad School	M	3:30 p.m.-4:20 p.m.	

BTYNY 69100- Skills for Success in Grad School

Credit Hours: 1.00. This course is aimed at first year graduate students in the Botany department. Its purpose is to introduce the students to the department, teach them what it takes to be a successful graduate student, and to help them develop effective written and oral communication skills. Typically offered Fall.
1.000 Credit hours

Chemistry

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
46322	CHM	50200	001	West Lafayette	3	Modern Chemistry in the High School	MW	3:30 p.m. - 4:20 p.m.	Upper Division
46324	CHM	50200	002	West Lafayette	0	Modern Chemistry in the High School	MW	4:30 p.m.-5:45 p.m.	Upper Division

14492	CHM	59900	001	West Lafayette	0-4	Special Assignments	TBA	TBA	Upper Division, Variable Title
22719	CHM	59900	003	West Lafayette	1	Teaching in Chemistry	R	4:30 p.m. – 6:20 p.m.	Upper Division, Variable Title
14508	CHM	69500	001	West Lafayette Campus	0	Sem Analytical Chem	T	3:30 p.m. – 5:00 p.m.	Variable Title
14509	CHM	69500	002	West Lafayette	0	Chemical Educ Seminar	W	4:30 p.m. -5:20 p.m.	Variable Title
14512	CHM	69500	005	West Lafayette	0	Sem Organic Chem	T	4:30 p.m.- 5:20 p.m.	Variable Title
14513	CHM	69500	006	West Lafayette	0	Sem Biochemistry	M	3:30 p.m.- 4:20 p.m.	Variable Title
42149	CHM	69500	013	West Lafayette	1	Chemical Educ Seminar	W	4:30 p.m. – 5:20 p.m.	Variable Title
42151	CHM	69500	014	West Lafayette	1	Sem Analytical Chem	T	3:30 p.m. – 5:00 p.m.	Variable Title
42152	CHM	69500	015	West Lafayette	1	Sem Biochemistry	M	3:30 p.m.- 4:20 p.m.	Variable Title
42156	CHM	69500	017	West Lafayette	1	Sem Organic Chem	T	4:30 p.m. – 5:20 p.m.	Variable Title
11452	CHM	69600	004	West Lafayette	3	Chemistry of Polymers	TR	3:00 p.m.- 4:15 p.m.	Variable Title
24242	CHM	69600	010	West Lafayette	3	Chem Imaging Biol Med Sci	TR	3:00 p.m. – 4:15 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

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

CHM 69600- Special Topics in Chemistry

Credit Hours: 1.00 to 3.00. Lectures on selected topics of current interest. Typically offered Fall Spring Summer.
1.000 TO 3.000 Credit hours

Computer Sciences

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
25514	CS	50023	DE1	West Lafayette	1	Data Engineering I	TBA	TBA	Upper Division, Online Distance Learning
25515	CS	50024	DE2	West Lafayette	1	Data Engineering II	TBA	TBA	Upper Division, Online Distance Learning
10794	CS	50100	EPE	West Lafayette	3	Computing for Science and Engineering	TBA	TBA	Upper Division
26054	CS	50300	001	West Lafayette	3	Operating Systems	TBA	TBA	Upper Division, Online Distance Learning
13272	CS	50300	LE1	West Lafayette	3	Operating Systems	MW	6:00 p.m. – 7:15 p.m.	Upper Division
26055	CS	51000	001	West Lafayette	3	Software Engineering	TBA	TBA	Upper Division, Online Distance Learning
26056	CS	52600	001	West Lafayette	3	Information Security	TBA	TBA	Upper Division, Online

									Distance Learning
10361	CS	52600	EPE	West Lafayette	3	Information Security	TBA	TBA	Upper Division, Online Distance Learning
26058	CS	52700	001	West Lafayette	3	Interact Comptr Graph	TBA	TBA	Upper Division, Online Distance Learning
26057	CS	52900	001	West Lafayette	3	Security Analytics	TBA	TBA	Upper Division, Online Distance Learning
13240	CS	52900	LE1	West Lafayette	3	Security Analytics	MW	6:00 p.m.-7:15 p.m.	Upper Division
26067	CS	53500	001	West Lafayette	3	Interactive Computer Graphics	TBA	TBA	Upper Division, Online Distance Learning
37412	CS	53500	LEI	West Lafayette	3	Interactive Computer Graphics	TR	3:00 p.m. – 4:15 p.m.	Upper Division
11515	CS	53600	EPE	West Lafayette	3	Data Communication and Computer Networks	TBA	TBA	Upper Division, Online Distance Learning
26059	CS	54100	001	West Lafayette	3	Database Systems	TBA	TBA	Upper Division, Online Distance Learning
26060	CS	57300	001	West Lafayette	3	Data Mining	TBA	TBA	Online Distance Learning
11520	CS	57800	EPE	West Lafayette	3	Statistical Machine Learning	TBA	TBA	Upper Division, Online Distance Learning
60972	CS	57800	FNY	West Lafayette	3	Statistical Machine Learning	TR	3:00 p.m. – 4:15 p.m.	Upper Division
26062	CS	57900	001	West Lafayette	3	Bioinformatics Algorithms	TBA	TBA	Upper Division, Online Distance Learning
16719	CS	57900	LE1	West Lafayette	3	Bioinformatics Algorithms	MW	4:30 p.m.-	Upper Division

								5:45 p.m.	
26063	CS	58000	001	West Lafayette	3	Algorithm Design, Analysis, and Implementation	TBA	TBA	Upper Division, Online Distance Learning
26064	CS	58400	001	West Lafayette	3	Theory of Computational Complexity	TBA	TBA	Upper Division, Online Distance Learning
26065	CS	59000	002	West Lafayette	3	Computing for Life Sciences	TBA	TBA	Upper Division, Variable Title, Online Distance Learning
26066	CS	59000	003	West Lafayette	3	Reinforcement Learning	TBA	TBA	Upper Division, Variable Title, Online Distance Learning
25422	CS	59000	BB	West Lafayette	3	Appls of ML and Explaniable AI	4:30 p.m.-5:45 p.m.	TR	Upper Division, Variable Title
17239	CS	59000	MLG	West Lafayette	3	Machine Learning on Graphs	4:30 p.m.-5:45 p.m.	TR	Upper Division, Variable Title
15343	CS	59000	RA	West Lafayette	3	Randomized Algorithms	3:00 p.m. – 4:15 p.m.	TR	Upper Division, Variable Title
25326	CS	59000	RL	West Lafayette	3	Reinforcement Learning	4:30 p.m.-5:45 p.m.	MW	Upper Division, Variable Title
17268	CS	59100	RS1	West Lafayette	1	Res Sem First Yr Gr Student	3:30 p.m. – 4:20 p.m.	MW	Upper Division, Variable Title
34240	CS	59100	SEC	West Lafayette	1	CERIAS Security Seminar	4:30 p.m. – 5:20 p.m.	W	Upper Division, Variable Title
17266	CS	59100	TA1	West Lafayette	1	Effective Teaching in CS	3:30 p.m. – 4:20 p.m.	MW	Upper Division, Variable Title
23199	CS	59799	001	West Lafayette	0	Graduate Professional Practice	TBA	TBA	Full-Time Privileges, Internship

CS 50100- Computing for Science and Engineering

Credit Hours: 3.00. Credit in this course may not be used toward a graduate degree in Computer Sciences. Computational concepts, tools, and skills for computational science and engineering scripting for numerical computing, scripting for file processing, high performance computing, and software development. Project may be required. Typically offered Fall.
3.000 Credit hours

CS 50300- Operating Systems

Credit Hours: 3.00. Basic principles of operating systems: addressing modes, indexing, relative addressing, indirect addressing, stack maintenance; implementation of multitask systems; control and coordination of tasks, deadlocks, synchronization, mutual exclusion; storage management, segmentation, paging, virtual memory; protection, sharing, access control; file systems; resource management; evaluation and prediction of performance. Students are expected to spend at least three hours per week gaining hands-on experience in using and modifying a small operating system. Typically offered Fall Spring.
0.000 OR 3.000 Credit hours

CS 51000- Software Engineering

Credit Hours: 3.00. Software life cycles, requirements engineering, software design, design of distributed systems, verification and validation, software architecture, process metrics and models, and research methods in software engineering. Typically offered Spring.
3.000 Credit hours

CS 52600- Information Security

Credit Hours: 3.00. (CSCI 52600) Basic notions of confidentiality, integrity, availability; authentication models; protection models; security kernels; secure programming; audit; intrusion detection and response; operational security issues; physical security issues; personnel security; policy formation and enforcement; access controls; information flow; legal and social issues; identification and authentication in local and distributed systems; classification and trust modeling; and risk assessment. Typically offered Fall.
3.000 Credit hours

CS 52700- Interact Comptr Graph

Credit Hours: 3.00. This course focuses on software security fundamentals, secure coding guidelines and principles, and advanced software security concepts. Students will learn to assess and understand threats, learn how to design and implement secure software systems, and get hands-on experience with common security pitfalls. Restricted to CS MS and CS PHD students. Significant programming experience and skills are required to complete the labs and projects. Typically offered Spring.
0.000 OR 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 53500- Interactive Computer Graphics

Credit Hours: 3.00. (ME 57300) The principles of computer graphics and interactive graphical methods for problem solving. Emphasis placed on both development and use of graphical tools for various display devices. Several classes of graphics hardware considered in detail. Topics include pen plotting, storage tubes, refresh, dynamic techniques, three dimensions, color, modeling of geometry, and hidden surface removal. Part of the laboratory involves use of an interactive minicomputer graphics system. Knowledge of programming required. Typically offered Fall.
3.000 Credit hours

CS 53600 – Data Communication and Computer Networks

Data communications: communication hardware technologies including local area and longhaul 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, internetworking 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, and DARPA internet protocols (TCP/IP) as examples of protocol organization. Typically offered Fall.
0.000 OR 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 57900- Bioinformatics Algorithms

Credit Hours: 3.00. Review of Genomes, DNA, RNA, proteins, proteomes. Biological Sequences: dynamic programming; pairwise global, local, and semi-global alignments of genes and proteins; constant, affine, and general gap penalties; RNA alignments; BLOSUM and PAM scoring matrices. Multiple alignment of proteins: approximation algorithms; iterative and progressive alignment methods. Database search for sequences: BLAST and variants. Phylogentic Trees: distance-based methods, ultrametric and additive distance functions; parsimony, and maximum likelihood methods. Whole Genome Alignment: suffix trees and suffix arrays. Systems Biology: Module discovery in biological networks, spectral algorithms for graph clustering. Network alignment: quadratic programming formulations and graph matching. Genetic Variation: haplotype inference, the perfect phylogeny problem and chordal graphs. Additional topics such as next-generation sequencing, analysis of multidimensional data from flow cytometry, and gene expression data, if time permits. Typically offered Fall.
3.000 Credit hours

CS 58000- Algorithm Design, Analysis, and Implementation

Credit Hours: 3.00. Basic techniques for designing and analyzing algorithms: dynamic programming, divide and conquer, balancing. Upper and lower bounds on time and space costs, worst case and expected cost measures. A selection of applications such as disjoint set union/find, graph algorithms, search trees, pattern matching. The polynomial complexity classes P, NP, and co-NP; intractable problems. Typically offered Fall Spring.
3.000 Credit hours

CS 58400- Theory of Computation and Computational Complexity

Credit Hours: 3.00. The theory of general purpose programming systems. Recursive and partial-recursive functions; recursive and recursively enumerable sets. The Church-Turing thesis. The recursion theorem, Rogers' translation theorem, Rice's undecidability theorem. The general theory of computational complexity: there are no general solutions to natural optimization problems. Complexity for specific models of computation: the polynomial complexity classes P, NP, and PSPACE; NP-hard and PSPACE-hard problems, inherently exponential problems. Typically offered Spring.
3.000 Credit hours

CS 59000 – Topics in Computer Science

Directed study for students who wish to undertake individual reading and study on approved topics. Permission of instructor required. Typically offered Fall Spring.
0.000 TO 5.000 Credit hours

CS 59100 – Seminar

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

CS 59799 – Graduate Professional Practice

Internship experience to complement the student's academic coursework and help prepare the student for employment in computer science. The student must present a letter from the proposed employer describing to a reasonable extent the work to be undertaken and find a member of the Computer Science Graduate Faculty to be the instructor. The student must have completed at least one semester as a computer science graduate student at Purdue, West Lafayette. May not be taken in successive semesters. Permission of instructor required. Typically offered Fall Spring Summer.
0.000 Credit hours

Earth, Atmospheric, and Planetary Sciences

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
21303	EAPS	50700	003	West Lafayette	3	Introduction to Analysis and Computing with Geoscience Data	TBA	TBA	Upper Division, Online Distance Learning
26118	EAPS	54000	002	West Lafayette	3	Introduction to Geodesy	TBA	TBA	Upper Division, Online Distance Learning
26119	EAPS	55600	002	West Lafayette	3	Planetary Geology	TBA	TBA	Upper Division, Online Distance Learning
26121	EAPS	55700	002	West Lafayette	3	Introduction to Seismology	TBA	TBA	Upper Division, Online Distance Learning
23023	EAPS	59100	143	West Lafayette	3	Integrated Global Sys Modeling	4:30 p.m. – 5:45 p.m.	MW	Upper Division, Variable Title
17637	EAPS	69100	001	West Lafayette	1	Seminar in Earth Science	R	3:30 p.m. –	

								4:20 p.m.	
17638	EAPS	69100	002	West Lafayette	0	Seminar in Earth Science	R	4:30 p.m. – 5:20 p.m.	

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 54000- Introduction to Geodesy

Credit Hours: 3.00. Course offers an introduction and overview of theory, techniques, data sources, and applications of geodesy. Provides understanding of how various geodetic techniques work and how they can be used to investigate a number of geological, atmospheric, and related problems. Evaluation of the robustness and quality of data as well as assessment of models and conclusions derived from geodetic methods. Typically offered Fall Spring.
3.000 Credit hours

EAPS 55600- Planetary Geology

Credit Hours: 3.00. The application of petrology and structural geology to other planets. Topics include: theories of star and solar system formation, orbital dynamics and Kepler's laws, petrology and geochemistry of meteorites, age dating techniques, structure and composition of the terrestrial, giant, and icy planets, planetary surfaces, planetary atmospheres, and theories of the formation of the moon. Offered in alternate years. Prior course work in earth materials is required. Typically offered Fall.
3.000 Credit hours

EAPS 55700- Introduction to Seismology

Credit Hours: 3.00. Theory of propagation to seismic waves in elastic media. Solution of wave equations for compressional, shear, and surface waves. Analysis of travel-times, amplitudes, and attenuation of seismic waves in terms of ray and wave theory. Principles of the seismograph. Structure of the earth as determined by seismological studies. Investigation of the causes, effects, distribution, and characteristics of earthquakes. Earthquake prediction. Typically offered Fall.
3.000 Credit hours

EAPS 59100 – Advanced Topics in Earth and Atmospheric Sciences

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

EAPS 69100- Seminar in Earth Science

Credit Hours: 1.00. Presentations and discussions by staff and graduate students on subjects of contemporary interest in the geologic sciences. Typically offered Fall Spring.
0.000 OR 1.000 Credit hours

Engineering Education

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
24329	ENE	50101	EP1	West Lafayette	3	Foundations of Engineering Education	TBA	TBA	Upper Division, Online Distance Learning
24330	ENE	50200	EPE	West Lafayette	3	History and Philosophy of Engineering Education	TBA	TBA	Upper Division, Online Distance Learning
24331	ENE	50300	EPE	West Lafayette	3	Engineering Education Inquiry	TBA	TBA	Upper Division, Online Distance Learning
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
66734	ENE	59000	004	West Lafayette	1-6	Special Problems in Engineering Education	TBA	TBA	Variable Title
25043	ENE	62000	EPE	West Lafayette	3	Design, Cognition and Learning	TBA	TBA	Online Distance Learning
68500	ENE	68500	EPE	West Lafayette	3	Educational Methods in Engineering	TBA	TBA	Online Distance Learning

17614	ENE	68700	001	West Lafayette	1	Mentored Teaching in Engineering	T	4:30 p.m. – 5:20 p.m.	
54097	ENE	69000	001	West Lafayette	0	Seminar in Engineering Education	R	3:30 p.m. – 4:20 p.m.	
23418	EPE	69000	EPE	West Lafayette	0	Seminar in Engineering Education	TBA	TBA	Online Distance Learning
24336	EPE	69500	EPE	West Lafayette	1	Succeeding as Engr Professor	TBA	TBA	Variable Title, Online Distance Learning

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 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

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 62000- Design, Cognition and Learning

Credit Hours: 3.00. Design is central to engineering: it is an integral part of the engineering profession and how we educate future professionals. Design cognition and learning is an area of engineering education research that seeks to understand what designers know and how they learn, and what tools best support design activity (e.g., collaboration, innovation, etc.). This research draws from many perspectives including cognitive psychology and the learning sciences, organizational learning, engineering and product design, architecture, human-centered interaction, and creativity and innovation. Themes in the course include (1) design knowledge, (2) what theories help understand design knowing and learning, (3) what are ways to study designers and design activity, and (4) how may design research inform design education and practice? Permission of instructor required. Typically offered Fall.
3.000 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.
3.000 Credit hours

ENE 68700 – Mentored Teaching in Engineering

Mentored experience in the teaching of engineering, with structured opportunities for individual reflection. All students create a scholarly teaching portfolio. Students who register for three credits conduct a scholarship of teaching and learning project. Prerequisites: Significant concurrent responsibility for teaching an engineering course. Registration in or completion of ENE 50600 (Content, Assessment And Pedagogy) or ENE 68500 (Educational Methods In Engineering); or instructor permission required. Typically

offered Fall Spring.
1.000 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

Mathematics

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
13009	MA	51100	004	West Lafayette	3	Linear Algebra with Applications	TR	4:30 p.m. – 5:45 p.m.	Upper Division
24835	MA	52700	006	West Lafayette	3	Advanced Mathematics for Engineers and Physicists I	TBA	TBA	Upper Division, Online Distance Learning
24892	MA	52700	EPE	West Lafayette	3	Advanced Mathematics for Engineers and Physicists I	TBA	TBA	Upper Division, Online Distance Learning
12919	MA	52700	ONC	West Lafayette	3	Advanced Mathematics for Engineers and Physicists I	TBA	TBA	Upper Division, Online Distance Learning
54847	MA	54400	003	West Lafayette	3	Real Analysis and Measure Theory	MWF	3:30 p.m.-4:20 p.m.	Upper Division
23413	MA	55700	001	West Lafayette	3	Abstract Algebra I	MWF	4:30 p.m.-5:20 p.m.	Upper Division
23430	MA	59800	503	West Lafayette	1	Abstract Algebra Prob Session	T	4:30 p.m. – 5:20 p.m.	Upper Division, Variable Title

63567	MA	59800	504	West Lafayette	1	Real Analysis Problem Session	R	4:30 p.m. – 5:20 p.m.	Upper Division, Variable Title
22510	MA	59800	511	West Lafayette	1	CCAM Seminar	M	4:30 p.m. – 5:20 p.m.	Upper Division, Variable Title
23002	MA	59800	516	West Lafayette	1	PDE Seminar	R	3:30 p.m.- 4:20 p.m.	Upper Division, Variable Title
23200	MA	59800	531	West Lafayette	3	Spectral Method Comp Fluid Dyn	TR	3:00 p.m. – 4:15 p.m.	Upper Division, Variable Title
24703	MA	59800	532	West Lafayette	1	Junior Probability Seminar	R	3:30 p.m. – 4:20 p.m.	Upper Division, Variable Title
24801	MA	59800	533	West Lafayette	2	Algebraic Group	TBA	TBA	Upper Division, Variable Title
12280	MA	59800	BR2	West Lafayette	1	Bridge to Research Sem	M	4:30 p.m.- 5:20 p.m.	Upper Division, Variable Title
25325	MA	59800	534	West Lafayette	3	Conformal Mapping III	TBA	TBA	Upper Division, Variable Title
35407	MA	59800	MC1	West Lafayette	1	Math Colloquium	T	3:30 p.m. – 4:20 p.m	Upper Division, Variable Title
18114	MA	59800	STU	West Lafayette	1	Student Colloquium	W	4:30 p.m. – 5:20 p.m.	Upper Division, Variable Title
18340	MA	65000	001	West Lafayette	3	Commutative Algebra	MWF	3:30 p.m.- 4:20 p.m.	
24569	MA	69000	001	West Lafayette	3	Deformation Theory	TBA	TBA	Variable Title

MA 51100- Linear Algebra with Applications

Credit Hours: 3.00. Real and complex vector spaces; linear transformations; Gram-Schmidt process and projections; least squares; QR and LU factorization; diagonalization, real and complex spectral theorem; Schur triangular form; Jordan canonical form; quadratic forms. Typically offered Summer.
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 54400 – Real Analysis and Measure Theory

Credit Hours: 3.00. Metric space topology; continuity, convergence; equicontinuity; compactness; bounded variation, Helly selection theorem; Riemann-Stieltjes integral; Lebesgue measure; abstract measure spaces; LP-spaces; Holder and Minkowski inequalities; Riesz-Fischer theorem. Typically offered Fall Spring.
3.000 Credit hours

MA 55700- Abstract Algebra 1

Credit Hours: 3.00. Review of fundamental structures of algebra (groups, rings, fields, modules, algebras); Jordan-Holder and Sylow theorems; Galois theory; bilinear forms; modules over principal ideal domains; Artinian rings and semisimple modules. Polynomial and power series rings; Noetherian rings and modules; localization; integral dependence; rudiments of algebraic geometry and algebraic number theory; ramification theory. Typically offered Fall.
3.000 Credit hours

MA 59800 – Topics in Mathematics

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

MA 69000- Topics in Algebra

Credit Hours: 1.00 to 3.00. Topics vary. Permission of instructor required. Typically offered Fall Spring Summer.
1.000 TO 3.000 Credit hours

Physics

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
47793	PHYS	57000	004	West Lafayette	3	TCH Erth Phys Sci Sec	MW	3:30 p.m. – 4:20 p.m.	Upper Division, Variable Title

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
22596	PHYS	57000	008	West Lafayette	3	Quantum Information & Geometry	TR	4:30 p.m.-5:45 p.m.	Upper Division, Variable Title
16679	PHYS	59000	002	West Lafayette	3	Sustain Energy Src 21st 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
24680	PHYS	59000	005	West Lafayette	0-6	Supernova Research	TBA	TBA	Upper Division, Variable Title
10748	PHYS	59300	029	West Lafayette	1-4	Independent Research	TBA	TBA	Honors, Upper Division, Variable Title
11194	PHYS	59300	030	West Lafayette	1-4	Independent Research	TBA	TBA	Honors, Upper Division, Variable Title
69161	PHYS	59500	001	West Lafayette	1-3	Instructional Design in Physical Science	TBA	TBA	Upper Division
20506	PHYS	60500	001	West Lafayette	2	Pedagogical Methods for Physics Graduate Students	T	3:30 p.m. – 5:20 p.m.	
20117	PHYS	69600	001	West Lafayette	1	Introduction to Physics Research	R	3:30 p.m. – 4:20 p.m.	

PHYS 57000- Tch Erth Phys Sci Sec

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

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 59300 – Independent Research

Research in some area of modern physics (spectroscopy, nuclear physics, solid state physics, elementary particle physics, biophysics, geophysics, etc.) with student receiving individualized supervision and guidance from staff member. This course may be used to satisfy the independent project or 500-level elective requirement of the undergraduate majors in Honors and Applied Physics Honors Programs. Permission of instructor required. Typically offered Fall Spring Summer.
1.000 TO 4.000 Credit hours

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

PHYS 60500- Pedagogical Methods for Physics Graduate Students

Credit Hours: 2.00. This course prepares physics graduate students for classroom and laboratory teaching assignments. Through 100 minutes per week of lectures and hands-on recitations, it provides an intensive survey of basic pedagogical methods, both theoretically and in practice. Students will learn and practice teaching techniques via various forms and microteaching, reading, and class discussion. A broad range of results from physics education research will be studied in detail. Additional topics include grading and assessment, responsible conduct in teaching related to issues such as gender, culture and ethnicity, students with disabilities, and ethics in academia, generally, including ethical conduct of research. Typically offered Fall.
0.000 OR 2.000 Credit hours

PHYS 69600- Introduction to Physics Research

Credit Hours: 1.00. Seminar designed to acquaint first-year physics graduate students with the research programs of the department. Typically offered Fall Spring.
1.000 Credit hours

Psychological Sciences

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
13546	PSY	51100	001	West Lafayette	0	Psychophysics	T	3:30 p.m.-5:20 p.m.	Upper Division
13550	PSY	51100	002	West Lafayette	3	Psychophysics	R	3:30 p.m.-5:20 p.m.	Upper Division
24460	PSY	66800	002	West Lafayette	0	Clinical Assessment II	TBA	TBA	
27879	PSY	67900	001	West Lafayette	0-6	Child Behvr Disord Prc	TBA	TBA	Full-Time Privileges, Practicum, Variable Title
37834	PSY	67900	002	West Lafayette	0-6	Testing & Assessment Practice	TBA	TBA	Full-Time Privileges, Practicum, Variable Title
37845	PSY	67900	008	West Lafayette	0	Child Behvr Disord Prc	TBA	TBA	Full-Time Privileges, Practicum, Variable Title
37846	PSY	67900	009	West Lafayette	0	Testing and Assessment Practice	TBA	TBA	Full-Time Privileges, Practicum, Variable Title
20071	PSY	67900	189	West Lafayette	0	Adult Disorders Prac	TBA	TBA	Full-Time Privileges, Practicum, Variable Title
20072	PSY	67900	190	West Lafayette	0-6	Adult Disorders Prac	TBA	TBA	Full-Time Privileges, Practicum, Variable Title
23802	PSY	67900	191	West Lafayette	0	Adult Disorders Prac	TBA	TBA	Full-Time Privileges, Practicum, Variable Title
23803	PSY	67900	192	West Lafayette	0-6	Adult Disorders Prac	TBA	TBA	Full-Time Privileges, Practicum, Variable Title
24657	PSY	67900	193	West Lafayette	0-6	Adv Outside Pract Clin	TBA	TBA	Full-Time Privileges, Practicum, Variable Title

28078	PSY	69000	001	West Lafayette	1-3	Individual Research in Psychology	TBA	TBA	Variable Title
28079	PSY	69000	002	West Lafayette	1-3	Individual Research in Psychology	TBA	TBA	Variable Title
50149	PSY	69000	005	West Lafayette	1-3	Individual Research in Psychology	TBA	TBA	Variable Title
12056	PSY	69000	006	West Lafayette	1-3	Individual Research in Psychology	TBA	TBA	Variable Title
24027	PSY	69000	007	West Lafayette	1-3	Individual Research in Psychology	TBA	TBA	Variable Title
28081	PSY	69100	002	West Lafayette	1-3	Readings in Psychology	TBA	TBA	Variable Title
28082	PSY	69100	003	West Lafayette	1-3	Readings in Psychology	TBA	TBA	Variable Title
28087	PSY	69700	001	West Lafayette	0	Clinical Psychology Internship	TBA	TBA	Full-Time Privileges, Internship
28088	PSY	69700	002	West Lafayette	0	Clinical Psychology Internship	TBA	TBA	Full-Time Privileges, Internship
28090	PSY	69700	004	West Lafayette	0	Clinical Psychology Internship	TBA	TBA	Full-Time Privileges, Internship
28091	PSY	69700	005	West Lafayette	0	Clinical Psychology Internship	TBA	TBA	Full-Time Privileges, Internship

PSY 51100- Psychophysics

Credit Hours: 3.00. (ECE 51100) An examination of the relationship between physical stimuli and perception (visual, auditory, haptics, etc.). Includes a review of various methods for studying this relationship and of the mathematical and computational tools used in modeling perceptual mechanisms. Permission of instructor required. Typically offered Fall Spring.
0.000 OR 3.000 Credit hours

PSY 66800 – Clinical Assessment II

Credit Hours: 4.00. Presentation of methods of clinical assessment including structured and unstructured personality tests, physiological recording, behavioral observation, and interview techniques. Emphasis is placed on laboratory practice in the administration and interpretation of personality tests and training in the basic clinical interview techniques. Permission of instructor required. Typically offered Spring.
0.000 OR 4.000 Credit hours

PSY 67900 – Practicum in Clinical Psychology

This is a practicum in clinical psychology, whereby students see individuals for therapy. These cases are supervised by faculty in clinical psychology. This is a requirement for the graduate program, and students must do both adult and child practicum. Students enrolled in this program must register for this course a minimum of four times. Prerequisite: Master's student standing and Psychology majors only. Permission of

instructor required. Typically offered Fall Spring Summer.
0.000 TO 6.000 Credit hours

PSY 69000 – Individual Research in Psychology

Involvement in research design, execution, and analysis under the guidance of a faculty member. Permission of instructor required. Typically offered Fall Spring Summer.
1.000 TO 3.000 Credit hours

PSY 69100 – Readings in Psychology

In-depth reading into specific topic area in psychology, under the guidance of a faculty member. Permission of instructor required. Typically offered Fall Spring Summer.
1.000 TO 3.000 Credit hours

PSY 69700 – Clinical Psychology Internship

Clinical psychology internship. Open only to Clinical Psychology students in approved internship facilities. Permission of instructor required. Typically offered Fall Spring Summer.
0.000 Credit hours

Statistics

CRN	SUBJECT	COURSE	SECTION	CAMPUS	CREDITS	TITLE	DAYS	TIME	ATTRIBUTE
65120	STAT	50300	008	West Lafayette	3	Statistical Methods for Biology	TBA	TBA	Upper Division, Distance Learning
53757	STAT	50600	002	West Lafayette	3	Statistical Programming and Data Management	MWF	3:30 p.m. – 4:20 p.m.	Upper Division
34237	STAT	51100	004	West Lafayette	3	Statistical Methods	TR	3:00 p.m. – 4:15 p.m.	Upper Division
17275	STAT	51200	014	West Lafayette	3	Applied Regression Analysis	TBA	TBA	Upper Division, Distance Learning
13361	STAT	51300	002	West Lafayette	3	Statistical Quality Control	TR	4:30 p.m. – 5:45 p.m.	Upper Division
17703	STAT	51400	EPE	West Lafayette	3	Design of Experiments	TBA	TBA	Upper Division, Distance Learning
10109	STAT	52500	002	West Lafayette	3	Intermediate Statistical Methodology	TR	3:00 p.m. – 4:15 p.m.	Upper Division

19646	STAT	52500	003	West Lafayette	3	Intermediate Statistical Methodology	TR	4:30 p.m. – 5:45 p.m.	Upper Division
20432	STAT	54100	001	West Lafayette	3	Advanced Probability and Options with Numerical Methods	TR	4:30 p.m. – 5:45 p.m.	Upper Division
63551	STAT	59800	019	West Lafayette	1	Explore Stat Sci Research	4:30 p.m. – 5:20 p.m.	W	Upper Division, Variable Title
25192	STAT	59800	040	West Lafayette	3	Design, Bayes, and Causal	TBA	TBA	Upper Division, Variable Title
17484	STAT	69200	002	West Lafayette	0	Statistics Seminar	4:30 p.m. – 5:20 p.m.	R	

STAT 50300 – Statistical Methods for Biology

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 50600- Statistical Programming and Data Management

Credit Hours: 3.00. Use of the SAS software system for managing statistical data. The SAS environment. Data description. Data access and management. SAS macro language and application development. Prerequisite: STAT 51200 and coursework in computer programming. Typically offered Fall Spring.
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

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 – Statiistical 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. Offered in alternate years. Typically offered Fall Spring.
3.000 Credit hours

STAT 51400 – Design of Experiments

Credit Hours: 3.00. Fundamentals, completely randomized design; randomized complete blocks; latin square; multi-classification; factorial; nested factorial; incomplete block and fractional replications for 2n, 3n, 2m x 3n; confounding; lattice designs; general mixed factorials; split plot; analysis of variance in regression models; optimum design. Use of existing statistical programs. Typically offered Fall Spring.
3.000 Credit hours

STAT 52500 – Intermediate Statistical Methodology

Credit Hours: 3.00. Statistical methods for analyzing data based on general/generalized linear models, including linear regression, analysis of variance (ANOVA), analysis of covariance (ANCOVA), random and mixed effects models, and logistic/loglinear regression models. Application of these methods to real world problems using SAS statistical software. Typically offered Fall Spring.
3.000 Credit hours

STAT 54100- Advanced Probability and Options with Numerical Methods

Credit Hours: 3.00. Stochastic interest rate models. American options from the probabilistic and PDE points of view. Numerical methods for European and American options, including binomial, trinomial, and Monte-Carlo methods. Typically offered Fall.
3.000 Credit hours

STAT 59800 – Topics in Statistical Methods

(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

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