

**PRE-VETERINARY CURRICULUM FOR PURDUE STUDENTS
MINIMUM CORE COURSE REQUIREMENTS**

<u>Core Subjects</u>	<u>Semesters *</u>
Inorganic chemistry with lab	2
Organic chemistry with lab	2
Biochemistry+	1
Biology with lab (diversity, developmental, cell structure)	2
Genetics with lab	1
Microbiology (general or medical) with lab	1
Nutrition (animal)	1
Physics with lab	2
Calculus	1
Statistics	1
English Composition	1
Communication (interpersonal, persuasion or speech)	1
Careers in Veterinary Medicine (if available)	1
Humanities (Foreign languages, cognitive sciences, and social sciences)	3

*Core subjects may vary as to the number of semesters required depending on the overall design and content of the core courses on a particular campus (e.g. 1 semester vs. 2 semesters.) Please consult with your undergraduate academic advisor and refer to the course descriptions immediately following.

+This course should be a complete upper-division course; half of a 2-semester sequence will not satisfy this requirement.

Purdue pre-veterinary students should follow their undergraduate programs of study regardless of minimums indicated.

Purdue University courses or combinations of courses that will meet these requirements are (semester credits shown in parentheses):

Chemistry (inorganic) - CHM 11100 (3), CHM 11200 (3), and 11600 (4); **or** CHM 11500 (4) and 11600 (4)
 Chemistry (organic) - CHM 25500 (3), 25501 (1), 25600 (3), and 25601 (1); **or** CHM 25700 (4), 25701 (1)
 Biochemistry - BCHM 30700 (3); **or** BCHM 56100 (3) and 56200 (3); **or** CHM 33300 (3)
 Biology – BIOL 11000 (4), 11100 (4), 23100 (3), and 23200 (2); **or** BIOL 12100 (2), 13100 (3) BIOL 19500 (2) ;
 23100 (3), and 23200 (2)
 Genetics - BIOL 24100 (3) and 24200 (2); **or** AGRY 32000 (3) and 32100 (1)
 Microbiology – BIOL 22100 (4); **or** BIOL 43800 (3) and 43900 (2)
 Nutrition – ANSC 22100 (3)
 Physics - PHYS 22000 (4) and 22100 (4)
 Calculus - MA 22300 (3); **or** MA 23100; **or** MA 16100 (5); **or** MA 16500 (4)
 Statistics - STAT 30100 (3); **or** 50300 (3)
 English - ENGL 10100 (3) and 10200 (3); **or** ENGL 10300 (3); **or** ENGL 10600 (4); **or** ENGL 10800 (3)
 Communication - COM 11400 (3); **or** COM 21200 (3); **or** COM 21700 (3); **or** COM 22400 (3)
 Careers in Veterinary Medicine - VM 10200 (1)
 Humanities

Other recommended courses: accounting (MGMT 20000); animal sciences (including nutrition (ANSC 32400)); biochemistry laboratory (BCHM 30900); business/technical writing (ENGL 42000, ENGL 42100); chemistry (CHM 22400); economics (AGEC 21700, ECON 21000, ECON 25100, ECON 25200); embryology (BIOL 46600); immunobiology (BIOL 53700); leadership (CSR 30900); personal finance (CSR 34200).

Course Descriptions

AGRICULTURAL ECONOMICS

AGEC 21700 *Economics* Class 3, cr. 3.

National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, monetary systems, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems.

AGRONOMY

AGRY 32000 *Genetics* Class 3, cr. 3. Prerequisite: BIOL 11000 and 11100, or equivalent.

The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding.

AGRY 32100 *Genetics Laboratory* Lab 3, cr. 1. Prerequisite or corequisite: AGRY 32000.

Experiments and demonstrations with higher plants, mammals, insects, and bacteria to elucidate the basic principles of classical and modern genetics.

ANIMAL SCIENCE

ANSC 22100 *Principles of Animal Nutrition* Class 3, cr. 3. Prerequisite: CHM 11200.

Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. (This course is offered on-line for students not on the Purdue campus. Contact Dr. Dale Forsyth, Animal Sciences, 765-494-4808.)

ANSC 32400 *Animal Nutrition* Class 2, lab. 2, cr. 3. Prerequisite: ANSC 22100; one course in computer sciences.

Application of the principles of animal nutrition to the formulation and feeding of supplements and complete rations for animals; ration ingredients and substitution values; computer applications; legal aspects of feed formulation; and industry practices.

BIOCHEMISTRY

BCHM 30700 *Biochemistry* Class 3, cr. 3. Prerequisite: CHM 25700 or equivalent.

Introduction to the chemistry, function, and metabolism of compounds found in the living organism.

BCHM 30900 *Biochemistry Laboratory* Lab 3, cr. 1. Corequisite: BCHM 30700.

Experiments that introduce methods for analysis and separation of biological molecules and that illustrate the biochemical and metabolic concepts covered in BCHM 30700.

BCHM 56100 *General Biochemistry I* Class 3, cr. 3. Prerequisite: CHM 25600 or 26200 or equivalent.

Protein structure and function, introduction to nucleic acids and molecular biology, properties of enzymes, mechanism of enzyme action, basic concepts of metabolism, introduction to membranes and hormone action.

BCHM 56200 *General Biochemistry II* Class 3, cr. 3. Prerequisite: BCHM 56100 or equivalent.

Amino acid metabolism, photosynthesis, biosynthesis of membrane lipids and steroids, biosynthesis of nucleotides, structure and function of nucleic acids, protein syntheses, and control of gene expression.

BIOLOGY

BIOL 11000 *Fundamentals of Biology I* Lec. 2, rec. 1, lab. 2, cr. 4. Does not satisfy School of Science laboratory science requirements. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences.

Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms.

BIOL 11100 *Fundamentals of Biology II* Lec. 2, rec. 1, lab. 2, cr. 4 This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences.

Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics.

BIOL 12100 *Biology I: Diversity, Ecology, and Behavior* Class 2, cr. 2.

Creates a framework for ordering biology by examining the unity and diversity of life on earth with an emphasis on ecology, genetics, population biology, evolution, and behavior.

BIOL 13100 *Biology II: Development, Structure, and Function of Organisms* Class 3, cr. 3.

Principles of development of plants and animals and the relationship between the structure and function of selected systems of these organisms.

BIOL 19500 *First Year Biology Lab* Class 2, cr. 2.

Reading, discussions, written reports, seminar presentations, and field or laboratory work provided for enrichment in special areas of the biological sciences.

BIOL 22100 *Introduction to Microbiology* Class 3, Lab 2, cr. 4. Prerequisite: one year of general chemistry and one semester of a life science. Does not satisfy requirements for biology majors.

The isolation, growth, structure, function, heredity, identification, classification, and ecology of microorganisms; their role in nature; and significance to man.

BIOL 23100 *Biology III: Cell Structure and Function* Class 2, cr. 2. Prerequisite or corequisite: BIOL 13100 and CHM 11600; or CHM 26100.

An introduction to modern cell biology through an examination of the physical and chemical properties that lead to an understanding of the molecular basis for cell function.

BIOL 23200 *Laboratory in Biology III: Cell Structure and Function* Lab 4, cr. 3. Prerequisite or corequisite: BIOL 23100.

Laboratory exercises designed to illustrate the properties, functions, and growth of prokaryotic and eukaryotic cells and to introduce the student to modern experimental methods used to study cells and their separated components

BIOL 24100 *Biology IV: Genetics and Molecular Biology* Class 3, cr. 3. Prerequisite: BIOL 27000 and CHM 11600; prerequisite or corequisite: one semester of organic chemistry.

An introduction to the principles of classical genetics and to molecular genetics. Topics covered are transmission of the genetic material (both in eukaryotes and prokaryotes); changes in genetic material, structure, and function of the genetic material; and the manipulation of genetic material (recombinant DNA technology).

BIOL 24200 *Laboratory in Biology IV: Genetics and Molecular Biology* Lab. 4, cr. 2. Prerequisite or corequisite: BIOL 28000.

Experiments in classical and modern genetics and exercises to acquaint the students with basic techniques in molecular biology.

BIOL 43800 *General Microbiology* Class 3, cr. 3. Prerequisite: BIOL 23100 and 24100. Corequisite: CHM 25600 or 25700 and 33300.

An examination of microbial diversity that emphasizes the interrelationship of bacteria and their environments. This includes aspects of cell composition, metabolism, and growth of microorganisms.

BIOL 43900 *Laboratory in General Microbiology* Lab. 6, cr. 2. Prerequisite or corequisite: BIOL 43800.

Includes enrichment cultures to isolate microorganisms, studies of cell composition, measurements of cell growth, and examination of enzyme regulation.

BIOL 46600 *Developmental Biology* Class 2, lab. 2, cr. 3. Prerequisite or corequisite: BIOL 12100, 12200, 13100, 13200, 27000, 27100, 28000, 28100.

The lectures and laboratories focus on what happens during the development of an organism and how we know what happens from experimental results. During the first half of the course, students spend time becoming familiar with the embryology of animals and plants by doing laboratory exercises in their lab manual. They also become adept working with chick embryos and Wisconsin Fast Plants because these are the two developing systems most students use to do their lab projects during the second half of the course.

BIOL 53700 *Immunobiology* Class 2, cr. 3. Prerequisite: BIOL 42000

Readings and discussion in the structural, cellular, and genetic basis of the immune response.

CHEMISTRY

CHM 11100 *General Chemistry* Class 2, lab. 3, cr. 3. Required of all freshmen in the School of Agriculture who are not in CHM 11500; required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500; required of students in physical therapy who are not in CHM 11500. Prerequisite: Two years of high school algebra. Not available for credit toward graduation in the School of Science.

Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements.

CHM 11200 *General Chemistry* Class 2, lab 3, cr. 3. Prerequisite: CHM 11100 or equivalent. Not available for credit toward graduation in the School of Science.

Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry.

CHM 11500 *General Chemistry* Class 3, lab. 3, cr. 4. Prerequisite: MA 15100 or placement into a calculus sequence (MA 16100 or MA 2230). One year of high school chemistry or one semester of college chemistry required. Required of students majoring in science and students in engineering who are not in CHM 12300.

Stoichiometry; atomic structure; periodic properties; ionic and covalent bonding; molecular geometry; gases, liquids, and solids; crystal structure; thermochemistry; descriptive chemistry of metals and nonmetals.

CHM 11600 *General Chemistry* Class 3, lab. 3, cr. 4. Prerequisite: CHM 115 or equivalent.

A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals.

CHM 22400 *Introductory Quantitative Analysis* Class 3, lab 4, cr. 4. Prerequisite: CHM 11200 or 11600.

Introduction to titrimetric, gravimetric, and instrumental methods of analysis. Required of students majoring in biology who do not take CHM 32100.

CHM 25500 *Organic Chemistry* Class 3, cr. 3. Prerequisite: CHM 11200 or 11600; recommended for biology majors.

A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc.; (b) general syntheses and reactions; and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates.

CHM 25501 *Organic Chemistry Laboratory* Lab 3, cr. 1. Prerequisite or corequisite: CHM 25500.

Laboratory experiments to accompany CHM 25500, illustrating methods of separation and the more common techniques and methods for preparing various types of organic compounds.

CHM 25600 *Organic Chemistry* Class 3, cr. 3. Prerequisite: CHM 25500 or equivalent.

A continuation of CHM 25500 with various functional groups such as the carboxyl, amino, etc., and including such polyfunctional natural products as carbohydrates and peptides.

CHM 25600 *Organic Chemistry Laboratory* Lab 3, cr. 1. Prerequisite or corequisite: CHM 25600.

A continuation of CHM 25501, but emphasizing methods for identifying organic compounds, including simple unknowns.

CHM 25700 *Organic Chemistry* Class 4, cr. 4. Prerequisite: CHM 11200, or 11600.

Introductory organic chemistry. Emphasis is on structure, nomenclature, reactions, and theory as applied to simple organic compounds. This course is designed for students who may be planning to take additional chemistry, especially biochemistry.

CHM 25701 *Organic Chemistry Laboratory* Lab 3, cr. 1. Prerequisite: CHM 25700.

Laboratory experiments designed to accompany CHM 257 and to illustrate methods of separation, identification, and preparation of selected organic molecules.

CHM 33300 *Principles of Biochemistry* Class 3, cr. 3. Prerequisite: A one-semester or a one-year course in organic chemistry.

Structure and function of biologically important molecules. Intended for students in life sciences.

COMMUNICATION

COM 11400 *Fundamentals of Speech Communication* Class 3, cr. 3.

A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations.

COM 21200 *Approaches to the Study of Interpersonal Communication* Class 3, cr. 3.

A study of the basic characteristics of human communication and the theoretical and practical implications of these characteristics for various forms of oral communication.

COM 21700 *Science Writing and Presentation* Class 3, cr. 3.

Students learn to effectively communicate scientific and technical information both verbally and in writing to a variety of audiences.

COM 22400 *Communicating in the Global Workplace* Class 3, cr. 3.

This introductory course explores communication issues that arise in the global workplace. The course develops an appreciation of the relationship among culture, communication, and ways of organizing and doing business.

CONSUMER SCIENCES & RETAILING

CSR 30900 *Leadership Strategies* Class 3, cr. 3.

Provides knowledge of humanistic processes that contribute to development of effective leadership.

CSR 34200 *Personal Finance* Class 3, cr. 3.

Lectures and discussion on problems of managing one's personal finances. Covers budgeting; use of and cost of credit; life and property insurance; income and estate taxation; housing; saving and investments; wills, trusts, and estate planning.

ECONOMICS

ECON 21000 *Principles of Economics* Class 3, cr. 3. No credit for management students.

Economics is the study of decision making under conditions of scarcity. This course looks at the behavior of the individual consumer and firm and their interaction with the government. The second half of the course studies the macroeconomy and focuses on the causes of inflation, unemployment, and interest rate changes. The international economy also will be studied.

ECON 25100 *Microeconomics* Class 3, cr. 3.

Price theory and resource allocation. Emphasis is on developing a detailed understanding of the principles of microeconomic analysis and their application to market behavior and public policy issues.

ECON 25200 *Macroeconomics* Class 3, cr. 3.

Introduction to macroeconomic theory. The course develops a theoretical framework permitting an analysis of the forces affecting national income, employment, interest rates, and the rate of inflation. Emphasis is placed upon the role of government fiscal and monetary policy in promoting economic growth and stable prices.

ENGLISH

ENGL 10100 *English Composition I* Class 3, cr. 3. Prerequisite for all courses in English except ENGL 10000 and 10300.

The first half of the basic composition sequence. Extensive practice in writing clear and effective prose. Instruction in logic, structure, and style.

ENGL 10200 *English Composition II* Class 3, cr. 3. Prerequisite: ENGL 10100, or, upon recommendation of instructor, ENGL 10000.

The second half of the basic composition sequence. Extensive practice in writing clear and effective prose. Instruction in logic, structure, and style. Students who receive an "A" in ENGL 10100 may, with their school's approval, substitute and elective course in English for ENGL 10200.

ENGL 10300 *Accelerated First-Year Composition* Class 3, cr. 3.

An accelerated composition course that substitutes for ENGL 10100 for students showing superior writing ability. Students who pass ENGL 103 are excused from ENGL 10200; those who fail ENGL 10300 must take ENGL 10100.

ENGL 10600 *First-Year Composition* Class 4, cr. 4.

Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing.

ENGL 10800 *Accelerated First-Year Composition* Class 3, cr. 3.

An accelerated composition course that substitutes for ENGL 106 for students showing superior writing ability.

ENGL 42000 *Business Writing* Class 3, cr. 3. Prerequisite: completion of first-year composition requirement.

Workplace writing in networked environments for management contexts. Emphasizes organizational context, project planning, document management, ethics, research, team writing. Typical genres include management memos, reports, letters, e-mail, resumes (print and online), oral presentations.

ENGL 42100 *Technical Writing* Class 3, cr. 3. Prerequisite: completion of first-year composition requirement.

Workplace writing in networked environments for technical contexts. Emphasizes context and user analysis, data analysis/display, project planning, document management, usability, ethics, research, team writing. Typical genres include technical reports, memos, documentation, Web sites.

MANAGEMENT

MGMT 20000 *Introductory Accounting* Class 3, cr. 3.

The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amounts the effect of manager and employee actions will appear in the statements.

MATHEMATICS

MA 16100 *Plane Analytic Geometry and Calculus I* Class 5, cr. 5. (Some schools or departments may allow only 4 credit hours toward graduation for this course. Designed for students who have not had at least a one-semester calculus course in high school with a grade of "A" or "B.") Prerequisite: demonstrated competency in college algebra and trigonometry at the level of MA 15100. Not open to students with credit in MA 16500.

Introduction to differential and integral calculus of one variable, with applications.

MA 16500 *Analytic Geometry and Calculus I* Class 4, cr. 4. (Designed for students who have had at least a one-semester calculus course in high school, with a grade of "A" or "B," but are not qualified to enter MA 16200 or 16600, or the advanced placement courses MA 17300 or 27100, or the honors calculus course MA 18100.) Prerequisite: demonstrated competency in college algebra and trigonometry at the level of MA 15100.

Introduction to differential and integral calculus of one variable, with applications. Conic sections.

MA 22300 *Introductory Analysis I* Class 3, cr. 3. Prerequisite: MA 15100 or equivalent.

Differential calculus with applications to management and economics.

MA 23100 *Calculus for the Life Sciences I* Class 3, cr. 3. Prerequisite: Algebra and Trigonometry at the level of MA 15900.

Limits, continuity, differentiation of functions including trig, log and exponential functions, chain rule, higher order derivatives, applications including max. min. and exponential growth and decay, integration by substitution, fundamental theorem of calculus.

PHYSICS

PHYS 22000 *General Physics* Class 3, lab. 2, cr. 4. Prerequisite: college algebra and trigonometry. Mechanics, heat, and sound, for students not specializing in physics.

PHYS 22100 *General Physics* Class 3, lab. 2, cr. 4. Prerequisite: PHYS 22000. Electricity, light, and modern physics, for students not specializing in physics.

STATISTICS

STAT 30100 *Elementary Statistical Methods* Class 3, cr. 3. (Also given as a self-managed course.) Prerequisite: college algebra. Not open to students in the Department of Mathematics and Schools of Engineering. Credit should be allowed in no more than one of STAT 30100, 30500, 43300, 50100, 50300, or 51100.

Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout.

STAT 50300 *Statistical Methods for Biology* Class 3, cr. 3. Prerequisite or corequisite: one semester of calculus. Open only to majors related to the life sciences. Credit should be allowed in no more than one of STAT 30100, 30500, 43300, 50100, 50300, or 51100.

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.