105C Preparatory - Physics

Preparation for the introductory physics sequence: mathematical concepts, notations, representations, effective problem solving techniques and study strategies.

106 Preparation for Science and Engineering


116 Calculus I

Fall, Spring. 4(4-0) P: (MTH 114 or MTH 116) or designated score on Mathematics Placement test RB: College Algebra and Trigonometry R: Open to students in the Lyman Briggs College. SA: LBS 118 Not open to students with credit in MTH 152H or MTH 153H. Limits, continuity, differentiation, integration, and elementary applications.

119 Calculus II

Fall, Spring. 4(4-0) P: LB 118 or MTH 132 or MTH 152H R: Open to students in the Lyman Briggs College. SA: LBS 118 Not open to students with credit in MTH 133 or MTH 153H.

Continuation of LB 118. Integration techniques, elementary differential equations, parametric curves, polar coordinates, sequences and series, vectors, and vector operations.

133 Introduction to History, Philosophy, and Sociology of Science

Fall, Spring. 4(4-0) P: Designated score on English Placement test R: Open to students in the Lyman Briggs College or in the Science, Technology, Environment and Public Policy Specialization. SA: LBS 133 Not open to students with credit in AL 192 or AL 192H or RACH 112 or WRA 110 or WRA 115 or WRA 125 or WRA 130 or WRA 135 or WRA 140 or WRA 145 or WRA 150 or WR 195H.

Introduction to the history, philosophy, and sociology of science, technology, the environment, and medicine. Instruction and practice in formal writing.

144 Biology I: Organismal Biology

Fall, Spring. 4(3-3) R: Open to students in the Lyman Briggs College. SA: LBS 144 Not open to students with credit in BS 162 or BS 172 or BS 182H or BS 192H. Modern biology at the organismal level of integration. Principles of genetics, evolution, ecology, and organismal diversity as interactive units.

145 Biology II: Cellular and Molecular Biology

Fall, Spring. 5(3-4) P: (LB 144 or BS 162 and BS 172) or (BS 182H and BS 192H) and (LB 171 or CEM 141 or CEM 181H or CEM 151) R: Open to students in the Lyman Briggs College. SA: LBS 145 Not open to students with credit in BS 161 or BS 171 or BS 181H or BS 191H.

Modern biology, mainly at the cellular level of integration. Principles of cell structure and function used to explain processes of bioenergetics, protein synthesis, and development.

155 Introduction to Quantitative Science and Research

Fall. 3(2-3) P: (MTH 1625 or concurrently) or (MTH 103 or concurrently) R: Open to freshmen in the Lyman Briggs College.

Exploration of fundamental chemistry, biology, physics, mathematics and statistics. Quantitative analysis and research.

171 Principles of Chemistry I

Fall. 4(4-0) P: MTH 114 or MTH 116 or MTH 120 (or concurrently) or MTH 133 or MTH 152H or MTH 153H or MTH 153H or concurrently) or (MTH 133 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently) or (LB 119 or concurrently) R: Open to students in the Lyman Briggs College. SA: LBS 175 Limits, continuity, differentiation, integration, and elementary applications.

171L Introductory Chemistry Laboratory I

Fall. 1(0-3) R: Open to students in the Lyman Briggs College. C: LB 171L Not open to students with credit in CEM 141 or CEM 151 or CEM 181H. C: LB 171L Concurrent.

Determination of density and molecular weight. Stoichiometry, acid-base titration, redox titration. Reaction kinetics, thermochemistry, Beer’s law, freezing point depression, and equilibrium constants.

172 Principles of Chemistry II

Spring. 3(4-0) P: LB 171 or CEM 141 or CEM 151 or CEM 181H R: Open to students in the Lyman Briggs College. C: LB 172L Concurrent.

Gases, properties of solutions, introduction to solid state chemistry, molecular orbital theory, chemical equilibrium, chemical kinetics, acid/base equilibria, solubility equilibria, entropy, free energy, electrochemistry, redox reactions, nuclear chemistry.

172L Principles of Chemistry II - Reactivity Laboratory

Spring. 1(0-3) P: (LB 171 or CEM 141 or CEM 152 or CEM 182H) and (LB 171L or CEM 161 or CEM 185H) R: Open to students in the Lyman Briggs College. C: LB 172L Concurrent.

Synthesis and characterization of chemical systems.

181 Introduction to Science, Technology, the Environment and Public Policy

Fall. 3(3-0) Interdepartmental with Fisheries and Wildlife and James Madison College. Administered by Fisheries and Wildlife. Relation of science and technology to ethics and public policy. Environmental law and public policy. Managing fish, water and wildlife resources at state, national, and international levels. Science and technology in developing countries. Impacts of military technology on environmental policy.

182 Honors Organismal and Population Biology Laboratory

Spring. 2(1-3) Interdepartmental with Biological Science and Plant Biology and Zoology. Administered by Biological Science. SA: BS 159H, BS 111L Not open to students with credit in BS 171 or LB 145.

Basic techniques of cellular and molecular biology including experimental design and hypothesis formulation; biochemistry, molecular biology and genetics.
Lyman Briggs—LB

273 Physics I
Fall. 4(3-3) P: LB 118 or MTH 132 or MTH 152H R: Open to students in the Lyman Briggs College. SA: LBS 271, LBS 271L, LBS 164 Not open to students with credit in PHY 183 or PHY 231 or PHY 193H or PHY 191 or PHY 251.

Basic physics principles and problem solving techniques. Mechanical systems (Newton’s laws, momentum and energy conservation, rotational motion, gravity), elementary thermodynamics, oscillations and waves, and atomic nuclei. Laboratory techniques, instrumentation, and selected experiments in classical and modern physics.

274 Physics II
Spring. 4(3-3) P: LB 273 or PHY 183 or PHY 193B or PHY 193H or PHY 233B RB: LB 119 or MTH 133 or MTH 153H R: Open to students in the Lyman Briggs College. SA: LBS 267, LBS 272, LBS 272L Not open to students with credit in PHY 184 or PHY 252 or PHY 294h or PHY 192 or PHY 252.

Basic physics principles and problem solving techniques. Electromagnetic theory, circuits, special relativity, quantum physics, optics, atomic and subatomic physics. Laboratory error analysis and selected experiments in classical and modern physics.

290A Directed Study-Multidisciplinary
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 290A

Directed studies involving at least two Lyman Briggs College curricular areas: biology, chemistry, physics, mathematics, history, philosophy, and sociology of science.

290B Directed Study—Biology
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 290B

Directed studies in biology.

290C Directed Study—Chemistry/Physics
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 290C

Directed studies in chemistry and physics.

290D Directed Study—Mathematics
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 290D

Directed studies in mathematics.

290E Directed Study—History, Philosophy, and Sociology of Science
Fall, Spring. Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 290E

Directed study in history, philosophy, and sociology of science.

290F Directed Study—Computing
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 290F

Directed studies in computing.

304 Lesbian, Gay, Bisexual, Transgender, Queer (LGBTQ) and Sexuality Studies
Spring. 3(0-0) Interdepartmental with Residential College in the Arts and Humanities and Women’s Studies. Administered by Women’s Studies. R: Not open to freshmen.

SA: WS 204

Interdisciplinary study of the history, politics, theories, science, cultures, and communities of lesbian, gay, transgender, queer, and intersex people including a global perspective.

330 Topics in History, Philosophy, and Sociology of Science (W)
Fall, Spring, Summer of odd years. 4(4-0) P: (LB 133) or completion of Tier I writing requirement R: Open to students in the Lyman Briggs College or the Science, Technology, Environment and Public Policy Specialization. SA: LBS 330

Topics in history, philosophy, and sociology of science, technology, the environment, and medicine.

331 Literature and Science (W)
Fall, Spring. 4(4-0) P: (LB 133) or completion of Tier I writing requirement R: Open to students in the Lyman Briggs College. SA: LBS 331

Representations of science, technology, the environment, and medicine in texts drawn from science fiction, Gothic, and utopian literature, or mainstream writings.

332 Technology and Culture (W)
Fall, Spring. 4(4-0) P: (LB 133) or completion of Tier I writing requirement R: Open to students in the Lyman Briggs College. SA: LBS 332

History of technology with special emphasis on the interaction of technical innovation and other elements of culture.

333 Topics in History of Science (W)
Fall, Spring. 4(4-0) P: (LB 133) or completion of Tier I writing requirement R: Open to students in the Lyman Briggs College or the Science, Technology, Environment and Public Policy Specialization. SA: LBS 333

Various themes or periods in physical/biological science. May emphasize patterns of theory development, changes in explanatory aims and standards or interaction of social and cultural factors with scientific ideas, practices, instrumentation or experimentalism.

335 The Natural Environment: Perceptions and Practices (W)
Fall of even years. Spring. 4(4-0) Interdepartmental with American Studies. Administered by Lyman Briggs. P: (LB 133) or completion of Tier I writing requirement R: Open to students in the Lyman Briggs College or in the American Studies major or in the Science, Technology, Environment and Public Policy Specialization. SA: LBS 335

American attitudes toward the natural environment and related public and private institutions.

336 Gender, Sexuality, Science, Technology (W)
Spring. 4(4-0) P: (LB 133) or completion of Tier I writing requirement R: Open to students in the Lyman Briggs College or in the Science, Technology, Environment and Public Policy Specialization. SA: LBS 336

Significance of gender in relation to science, technology, the environment, and medicine.

347 Advances in Applied Biology
Fall. 3-1-4 P: (LB 145 or BS 161 and BS 171) or (BS 181H and BS 191H) R: Completion of Tier I Writing Requirement R: Open to students in the Lyman Briggs College. SA: LBS 347

Advances in cell and molecular biology and applications: plant and animal breeding, environment, and therapeutics.

355 Philosophy of Technology (W)
Spring. 4(4-0) Interdepartmental with Philosophy. Administered by Lyman Briggs. P: (LB 133) or completion of Tier I writing requirement RB: PHIL 200 R: Open to students in the Department of Philosophy or in the Lyman Briggs College or in the Science, Technology, Environment and Public Policy Specialization. SA: LBS 355

Examination of the desirability of technology, its social forms, and its alternatives. Conventional productivist, ecological progressive, and radical humanist outlooks.

368 Science, Technology and Society
Fall. 3(0-0) Interdepartmental with Sociological Studies. Administered by Sociology. RB: (LB 133) or some familiarity with basic concepts and methods in sociology. R: Not open to freshmen or sophomores.

Role of science and technology in social change. Values and ethics in contemporary perspectives, controversies, and cases. Science and technology as forms of knowledge.

380 International Studies in Lyman Briggs College
Fall, Spring. Summer. 1 to 8 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Approval of college; application required.

International experiences. Contemporary and historical problems in science from local to international levels. Case studies and interactions with officials, community leaders and leading professionals.

425 American and European Health Care since 1800
Spring. 4(4-0) Interdepartmental with History. R: Completion of Tier I writing requirement R: Not open to freshmen.

438 Philosophy of Ecology (W)
Spring of odd years. 3(3-0) Interdepartmental with Fisheries and Wildlife. Administered by Fisheries and Wildlife. P: Completion of Tier I Writing Requirement. RB: Additional coursework in ecology, natural resources, philosophy, or environmental sciences. R: Open to juniors or seniors or graduate students. Conceptual issues in the science of ecology, including connections between ecology and environmental philosophy. Western and non-western perspectives.

459 Science, Technology, Environment and Public Policy Capstone
Fall, Spring. 3(3-0) Interdepartmental with James Madison College. Administered by James Madison College. P: (FW 181 or approval of college) and completion of Tier I writing requirement. Selected topics in science, technology, environment and public policy (STEPPE). Analysis of key issues and problems. Case studies.

473A Literature and Medicine

490A Advanced Directed Study--Multidisciplinary
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 490A Directed advanced studies involving at least two Lyman Briggs College curricular areas: biology, chemistry, physics, mathematics, history, philosophy, sociology of science, and computing.

490B Advanced Directed Study--Biology
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 490B Directed advanced studies in biology.

490C Advanced Directed Study--Chemistry or Physics
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 490C Directed advanced studies in chemistry or physics.

490E Advanced Directed Study--History, Philosophy, Sociology of Science (W)
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: (LB 133) or completion of Tier I writing requirement. R: Open to students in the Lyman Briggs College or in the Science, Technology, Environment and Public Policy Specialization. SA: LBS 490E Directed advanced studies in history, philosophy, sociology of science, technology, the environment, or medicine.

492 Senior Seminar (W)
Fall, Spring. 4(4-0) P: ((LB 330 or LB 331 or LB 332 or LB 333 or LB 334 or LB 335 or LB 336 or LB 339 or LB 490E) or approval of college) and completion of Tier I writing requirement. R: Open to juniors or seniors in the Lyman Briggs College or in the Science, Technology, Environment and Public Policy Specialization. SA: LBS 492 Selected problems in the study of science and technology as human activities, using philosophical, historical, literary, social science or interdisciplinary perspectives or methods. Development and defense of thesis paper.

493 Field Experience
Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open to students in the Lyman Briggs College. SA: LBS 493 Experiential learning related to the public or private practice of science and technology.

494 Undergraduate Research
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Approval of college; application required. SA: LBS 494 Faculty-guided undergraduate research.