

LYMAN BRIGGS

LB

Lyman Briggs College

118 Calculus I

Fall, Spring. 5(5-0) 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 132 or MTH 133 or MTH 152H.

Limits, continuity, differentiation, integration, and elementary applications.

119 Calculus II

Fall, Spring. 4(4-0) P: LB 118 R: Open to students in the Lyman Briggs College. SA: LBS 119 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.

126 Personal Computers and Networks

Fall. 3(3-0) R: Open to students in the Lyman Briggs College. SA: LBS 126 Not open to students with credit in CSE 101.

Selecting, installing and using personal computer software and hardware. Computer networks.

133 Introduction to History, Philosophy, and Sociology of Science (D)

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 RCAH 112 or WRA 110 or WRA 115 or WRA 120 or WRA 125 or WRA 130 or WRA 135 or WRA 140 or WRA 145 or WRA 150 or WRA 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 110.

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 110 or BS 148H) 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 111 or BS 111L.

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.

148H Honors Organismal Biology

Fall. 3(3-0) Interdepartmental with Biological Science. Administered by Biological Science. Not open to students with credit in BS 110 or LB 144.

Diversity and basic properties of organisms, with emphasis on genetic principles, ecological interactions, and the evolutionary process. Historical approach to knowledge discovery.

149H Honors Cell and Molecular Biology

Spring. 3(3-0) Interdepartmental with Biological Science. Administered by Biological Science. P: (CEM 141 or concurrently) or (CEM 151 or concurrently) or (CEM 181H or concurrently) or (LB 171 or concurrently) Not open to students with credit in BS 111 or LB 145.

Exploration of the physicochemical and molecular organization of cells as the unifying framework for genetics, evolution, and the social relevance of biology.

158H Honors Organismal Biology Laboratory

Fall. 2(1-3) Interdepartmental with Biological Science. Administered by Biological Science. Not open to students with credit in BS 110 or LB 144. C: BS 148H concurrently.

Basic procedures used by organismal biologists, including experimental design and statistical methods. Development and implementation of research projects to test hypotheses in genetics, ecology, and evolution.

159H Honors Cell and Molecular Biology Laboratory

Spring. 2(1-3) Interdepartmental with Biological Science. Administered by Biological Science. Not open to students with credit in BS 111L or LB 145. C: BS 149H concurrently.

Basic techniques of cellular and molecular biology including experimental design and hypothesis formulation. Student-initiated projects to test hypothesis-driven projects in biochemistry, molecular biology or genetics.

171 Principles of Chemistry I - Structure

Fall. 4(4-0) P: MTH 114 or (MTH 116 or concurrently) or (MTH 132 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 165, LBS 171 Not open to students with credit in CEM 141 or CEM 151 or CEM 181H. C: LB 171L concurrently.

Chemical principles: structure and bonding, periodic properties. Stoichiometry, states of matter. Solutions, acids and bases, equilibria, thermodynamics, and kinetics.

171L Introductory Chemistry Laboratory I

Fall. 1(0-3) R: Open to students in the Lyman Briggs College. SA: LBS 165L, LBS 171L Not open to students with credit in CEM 161 or CEM 185H. C: LB 171 concurrently.

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 - Reactivity

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. SA: LBS 266, LBS 172 Not open to students with credit in CEM 142 or CEM 152 or CEM 182H. C: LB 172L concurrently.

Spectroscopy, coordination chemistry, solubility and stability constants. Electrochemistry, main group chemistry, atmospheric chemistry, and organometallic chemistry. Polymers and biochemistry.

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. SA: LBS 266L, LBS 172L Not open to students with credit in CEM 162 or CEM 186H. C: LB 172 concurrently.

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.

220 Calculus III

Fall, Spring. 4(4-0) P: LB 119 or MTH 133 or MTH 153H R: Open to students in the Lyman Briggs College. SA: LBS 220 Not open to students with credit in MTH 234 or MTH 254H.

Continuation of LB 119. Differential calculus of functions of two or three variables. Double and triple integrals. Line and surface integrals.

271 Physics I

Fall. 3(4-0) P: LB 118 or MTH 132 or MTH 152H or MTH 133 R: Open to students in the Lyman Briggs College. SA: LBS 164, LBS 271 Not open to students with credit in PHY 183 or PHY 183B or PHY 193H or PHY 231 or PHY 231B or PHY 231C. C: LB 271L concurrently.

Basic physics principles, problem solving techniques. Mechanical systems, elementary thermodynamics, vibrations and waves. Atoms and nuclei.

271L Physics Laboratory I

Fall. 1(0-3) P: LB 118 or MTH 132 or MTH 152H or MTH 133 R: Open to students in the Lyman Briggs College. SA: LBS 164L, LBS 271L Not open to students with credit in PHY 191 or PHY 251. C: LB 271 concurrently.

Techniques and instruments in the physics laboratory. Selected experiments in classical and modern physics.

272 Physics II

Spring. 3(4-0) P: (LB 271 and LB 271L) and (LB 118 or MTH 132 or MTH 152H) R: Open to students in the Lyman Briggs College. SA: LBS 267, LBS 272 Not open to students with credit in PHY 184 or PHY 184B or PHY 294H or PHY 232 or PHY 232B or PHY 232C. C: LB 272L concurrently.

Principles of electromagnetic theory, special relativity, quantum physics, optics, atomic and subatomic physics.

272L Physics Laboratory II

Spring. 1(0-3) P: LB 271L and LB 271 R: Open to students in the Lyman Briggs College. SA: LBS 267L, LBS 272L Not open to students with credit in PHY 192 or PHY 252. C: LB 272 concurrently.

Selected experiments in classical and modern physics.

Lyman Briggs—LB

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.

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 in 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) 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 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 in 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.

334 Science, Technology, and Public Policy (W)

Fall of odd years, 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 334
Formation, implementation, and evaluation of public policy related to science, technology, the environment, and medicine.

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, 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.

346 Advances in Ecology, Evolutionary and Behavioral Biology

Spring. 3(1-4) A student may earn a maximum of 6 credits in all enrollments for this course. P: ((LB 144 or BS 110) or (BS 148H and BS 158H)) and Completion of Tier I Writing Requirement R: Open to undergraduate students in the Lyman Briggs College. SA: LBS 246, LBS 346
Advances in organismal biology with an emphasis in field-based science.

347 Advances in Applied Biology

Fall. 3(1-4) P: (LB 145 or (BS 111 and BS 111L) or (BS 149H and BS 159H)) and 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 application: 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: PHL 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(3-0) Interdepartmental with Sociology. 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.

415 Methods of Theoretical Physics

Spring of odd years. 4(4-0) Interdepartmental with Physics. Administered by Lyman Briggs. P: ((MTH 234 or concurrently) or (LB 220 or concurrently) or (MTH 254H or concurrently)) and (LB 271 or PHY 183 or PHY 193H) and (LB 272 or PHY 184 or PHY 294H) RB: (MTH 235 or concurrently) or (MTH 255H or concurrently) or (MTH 340 or concurrently) R: Open to students in the College of Engineering or in the Lyman Briggs College or in the Department of Mathematics or in the Department of Physics and Astronomy. SA: LBS 415
Mathematical methods applied to physical problems in mechanics, electromagnetism, and thermodynamics. Multiple integration, vector calculus, Fourier series, ordinary and partial differential equations, eigenvector problems, coordinate transformations, and complex analysis. Newtonian mechanics, rigid body dynamics, heat flow, electrostatics, harmonic motion, and waves.

425 American and European Health Care since 1800

Spring. 4(4-0) Interdepartmental with History. Administered by History. P: Completion of Tier I writing requirement. R: Not open to freshmen.
Social and cultural transformation in health care delivery since 1800, primarily in North America and western Europe. Therapeutic revolutions. Medical education and professionalization. Social and alternative medicine. Managed care.

- 438 Philosophy of Ecology (W)**
 Spring of even 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.
- 483 Literature and Medicine**
 Spring. 3(3-0) Interdepartmental with English. Administered by English. R: Not open to freshmen or sophomores.
 Human dimensions of medicine as seen in literature. Health, illness, mortality. Medical dilemmas. Physical and psychological self. Psychological theories used in interpreting literature.
- 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.
- 490D Advanced 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 490D
 Directed advanced studies in mathematics.
- 490E Advanced Directed Study--History, Philosophy, Sociology of Science (W)**
 Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 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: Completion of Tier I Writing Requirement RB: One course in the History, Philosophy, and Sociology of Science at the 300-level or higher. R: Open to juniors or seniors in the Lyman Briggs College or in the Entomology major 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.