299. Special Projects
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. Approval of department.
Work in areas outside regular course offerings.

301. Introduction to Russian Literature
Fall. 3(3-0) RUS 203 or approval of department.
Selections from representative works of major Russian authors, with concentration on the nineteenth century. Familiarization with essential Russian literary terminology.

302. Introduction to Russian Literature
Winter. 3(3-0) RUS 301.
Continuation of RUS 301.

303. Introduction to Russian Literature
Spring. 3(3-0) RUS 302.
Continuation of RUS 302.

321. Advanced Composition and Conversation
Fall. 3(3-0) RUS 203.
Review of finer points of grammar. Oral reports, tape recordings, intensive class discussion. Written exercises, translations into Russian, compositions.

322. Advanced Composition and Conversation
Winter. 3(3-0) RUS 321.
Continuation of RUS 321.

323. Advanced Composition and Conversation
Spring. 3(3-0) RUS 322.
Continuation of RUS 322.

325. Russian Civilization and Culture
Fall. 3(3-0) RUS 203.
Cultural heritage of the Russian people. Readings on history, geography, the arts, religion, ideologies.

326. Russian Civilization and Culture
Winter. 3(3-0) RUS 203.
Continuation of RUS 325.

327. Russian Civilization and Culture
Spring. 3(3-0) RUS 203.
Continuation of RUS 326.

341. Alexander Solzhenitsyn and the Russian Literary Tradition in English Translation
Fall. 3(3-0) Knowledge of Russian is not required.
Reading of the principal works of Alexander Solzhenitsyn with inquiry into their literary and philosophical antecedents, especially Dostoevsky and Tolstoy.

401. Russian Literature Before 1917
Fall of odd-numbered years. 3(3-0) RUS 303 or RUS 327.
Major literary movements, authors, and works from the Kievan time to 1917.

402. Russian Literature Before 1917
Winter of even-numbered years. 3(3-0) RUS 401.
Continuation of RUS 401.

403. Russian Literature Before 1917
Spring of even-numbered years. 3(3-0) RUS 402.
Contintuation of RUS 402.

410. Russian Reading Skills
Fall, Winter, Spring, Summer. 5(5-0) RUS 101 or graduate students or approval of department.
Designed for those in scientific or other fields who wish to be able to read scholarly material. An intensive presentation of Russian grammar with emphasis on those features and techniques necessary for reading and translation.

411. Russian Reading Skills
Fall, Winter, Spring, Summer. 5(5-0) RUS 103 or RUS 410 and approval of department.
Reading and translation of works in the student's field of interest. Completion of RUS 410 and RUS 411 with a 3.0 or better will satisfy the Ph.D. reading requirement in most departments.

425. Contemporary Russian Literary Language
Fall. 3(3-0) RUS 323.
Description and analysis of contemporary Russian literary language, its phonology, morphology and syntax. Designed especially for future teachers of Russian.

426. Contemporary Russian Literary Language
Winter. 3(3-0) RUS 425 or approval of department.
Continuation of RUS 425.

427. Contemporary Russian Literary Language
Spring. 3(3-0) RUS 426 or approval of department.
Continuation of RUS 426.

499. Special Projects
Fall, Winter, Spring, Summer. 1 to 8 credits. May reenroll for a maximum of 18 credits. Approval of department.
Work in areas outside regular course offerings.

801. Slavic Bibliography and Research Methods
Fall of odd-numbered years. 3(3-0)
Bibliographies of Slavic literature and languages. The library and the utilization of its resources. Principles of bibliographic compilation and research techniques in Russian Literature and linguistics.

817. Nineteenth Century Russian Prose I
Fall of odd-numbered years. 3(3-0)
Pushkin and Chekhov's search for a modern literary expression.

828. Introduction to Old Church Slavic
Fall of even-numbered years. 3(3-0) Basic knowledge of Russian or another Slavic language.
Grammatical structure of the first written Slavic language accompanied by readings from the canonical Old Church Slavic texts.

832. Russian Drama Before 1859
Winter of odd-numbered years. 3(3-0)
Origin and development of Russian drama. Analysis of major plays by Fonvizin, Griboyedov, Pushkin, Lermontov and Gogol.

836. Nineteenth Century Russian Poetry
Winter of even-numbered years. 3(3-0) RUS 835 or approval of department.
Trends and styles in 19th century Russian poetry up to 1890. Emphasis on major poetry by Zhukovsky, Batyushkov, Pushkin, Baratynsky, Yazykov, Tyutchev, Lermontov, Tolstoy, Fet, Nekrasov, and Solovyev.

851. Russian Literary Criticism, 20th Century
Winter of odd-numbered years. 3(3-0)
Aestheticism, Transcendentalism and Socialist Realism.

856. Twentieth Century Russian Prose I
Winter of even-numbered years. 3(3-0)
Modernistic trends in Russian prose before 1917.

860. Graduate Reading Course
Fall, Winter, Spring. 1 to 5 credits. May reenroll for a maximum of 15 credits. Approval of department.
Supervised reading course for investigation of special fields in Russian literature.

899. Master's Thesis Research
Fall, Winter, Spring. Variable credit. Approval of department.

981. Seminar in Slavic Studies
Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 18 credits.
A particular writer, a major work, or a limited theme is chosen for intensive analysis.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credits. May reenroll for a maximum of 36 credits.

LYMAN BRIGGS SCHOOL LBS

College of Natural Science

Lyman Briggs School has a six term sequence in Chemistry and Physics that may be completed to fulfill the School's requirements in Chemistry and Physics. This sequence involves Lyman Briggs School 161 through 163L and Lyman Briggs School 261 through 263L. It is a coordinated sequence that is comparable to certain courses in the Department of Chemistry and the Department of Physics. Any student who plans to complete only part of the sequence must contact the faculty coordinator of either the Chemistry or the Physics portion.

111. College Algebra
Fall. 5(5-0) Placement Test or approval of school. Not open to students with credit in MTH 108, MTH 109, or MTH 111.
Rational and real numbers, functions, inverse functions, polynomials, rational functions, exponential and logarithmic functions, trigonometric functions and their inverses.

112. Calculus I
Fall, Winter, Spring. 5(5-0) LBS 111 or MTH 109; LBS 124 concurrently. Not open to students with credit in MTH 112.
Theory and applications of derivatives to polynomials, rational functions, trigonometric functions and their inverses, logarithmic and exponential functions. Definition and properties of the definite integral. Numerical approximations of definite integrals.

113. Calculus II

Fall, Winter, Spring. 5(5-0) LBS 112 and LBS 124. Not open to students with credit in MTH 113.

Further applications of the derivative to related rates, approximations including Newton's method and graphing. The mean value theorem. Integration techniques, applications, and improper integrals. The conics and polar coordinates.

124. APL-Computer Programming for Scientists

Fall, Winter, Spring. 3(3-0) LBS 112 or concurrently. Interdepartmental with the Department of Computer Science.

APL programming; interactive programming techniques; arithmetic, logical, and extended APL operators; functions; applications to concurrent topics in mathematics; principles of operation of time-shared computers.

131. Science and Technology Studies: Writing I

Fall, Winter, Spring. 4(4-0)

Instruction and practice in expository writing. Paper and report topics on science, technology and human values in Western civilization.

For prerequisite purposes the introductory biology sequence LBS 140, 141, 242 may be used in place of Biological Science 210, 211, 212.

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140. Biology I

Winter, Spring. 4(3-3) Not open to students with credit in B S 212.

The organisms and their environment. Organismal level of organization. Evolution and adaptation as forces for biological variance.

141. Biology II

Fall, Spring. 4(3-3) LBS 140; not open to students with credit in B S 210.

Cellular structure and function. Maintenance and manipulation of materials, energy, space and information at the cellular and tissue level of organization.

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142. Biology IA

Winter, Spring. 1 to 2 credits. May reenroll for a maximum of 4 credits. LBS 140 or concurrently.

Selected problems such as analysis of biological data, interspecific and intraspecific competition, microarthopods inhabiting leaf litter, spring flora, diversity, stability and evolution of natural communities.

160. Physics—Elementary Concepts

Winter. 1(2-0) LBS 162 concurrently.

Elementary concepts of mechanics, electricity, magnetism and optics.

161. Introduction to Chemistry and Physics I

Fall. 3(4-0) MTH 108 or MTH 109 or MTH 111 or LBS 111 concurrently; LBS 161L or concurrently or approval of instructor.

Gases and gas laws, kinetic theory, heat and thermodynamics. Equilibria, solutions, acids and bases, ionization and electrolysis.

161L. Introductory Chemistry Laboratory

Fall. 1(0-3) LBS 161 or concurrently or approval of instructor.

Techniques and instruments in the chemistry laboratory. Includes qualitative, quantitative and synthetic work.

162. Introduction to Chemistry and Physics II

Winter. 3(4-0) LBS 161; LBS 162L or concurrently or approval of instructor.

Basic concepts of atomic and nuclear structure, wave particle duality, the quantum theory and the special theory of relativity. Radioactivity, nuclear reactions and elementary particle physics.

162L. Introductory Physics Laboratory

Winter. 1(0-3) LBS 162 or concurrently or approval of instructor.

Introduction to techniques and instruments in the physics laboratory. Selected experiments in classical and modern physics.

163. Introduction to Chemistry and Physics III

Spring. 3(4-0) LBS 162; LBS 163L or concurrently or approval of instructor.

Periodic properties and chemical families, stoichiometry, modern theory of chemical bonding, molecular orbitals. Chemical dynamics and equilibria, some organic chemistry nomenclature and reaction kinetics.

163L. Introductory Chemistry Laboratory

Spring. 1(0-3) LBS 163 or concurrently or approval of instructor.

Continuation of LBS 161.

216. Calculus III

Fall, Spring. 5(5-0) LBS 113.

Series, sequences, power series including Taylor series, and indeterminate forms. Graphing and vector geometry in 3-spaces. Differential calculus of functions of several variables through Taylor series and extreme points.

217. Calculus IV

Fall, Winter. 5(5-0) LBS 216. Credit may not be earned in both LBS 217 and MTH 310.

Double and triple integrals and their applications. Line integrals. Ordinary differential equations of first order and linear second order equations, including series solutions. Numerical methods for single and simultaneous equations.

232. Science and Technology Studies: Writing II

Fall, Winter, Spring. 4(4-0) LBS 131; sophomores.

A writing course emphasizing investigative expository papers. Paper and report topics drawn from readings in the history and philosophy of science and technology, and other areas of science technology studies.

233. Science and Technology Studies: Special Topics

Fall, Winter, Spring. 1 to 2 credits. May reenroll for a maximum of 6 credits. LBS 232.

Guided study of relations between the humanities and sciences. Students submit written work.

For prerequisite purposes the introductory biology sequence LBS 140, 142, 242 may be used in place of Biological Science 210, 211, 212.

242. Biology III

Fall, Winter. 4(3-3) LBS 141. Not open to students with credit in B S 211.

Organismal growth and development from molecular genetics through life cycles of selected plant and animal species.

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256. Energy Consumption and Environmental Quality (N)

Spring. 4(4-0) Interdepartmental with and administered by Physics.

The role of energy as a fundamental pollutant will be discussed along with the availability of fossil energy sources. Limitations on the safe utilization of both fossil and nuclear energy will also be considered.

261. Introduction to Chemistry and Physics IV

Fall. 3(4-0) LBS 163; LBS 261L or concurrently or approval of instructor; LBS 112 or MTH 112 recommended.

Kinematics and dynamics of classical particle and rigid body motion. Fundamentals of atomic, molecular vibration-rotation and nuclear magnetic resonance spectroscopy.

261L. Introductory Physics Laboratory

Fall. 1(0-3) LBS 261 or concurrently or approval of instructor.

Continuation of LBS 162L.

262. Introduction to Chemistry and Physics V

Winter. 3(4-0) LBS 261; LBS 262L or concurrently or approval of instructor.

Chemistry of non-metals, transitional elements and coordination compounds, some organic chemistry. The major emphasis is on descriptive chemistry using principles developed in LBS 161, LBS 162, and LBS 163.

262L. Introductory Chemistry Laboratory

Winter. 1(0-3) LBS 262 or concurrently or approval of instructor.

Continuation of LBS 163L.

263. Introduction to Chemistry and Physics VI

Spring. 3(4-0) LBS 261; LBS 263L or concurrently or approval of instructor.

Classical theory of electricity and magnetism. Electromagnetic wave motion and wave optics. Selected topics in solid state physics, and the special and general theories of relativity.

263L. Introductory Physics Laboratory

Spring. 1(0-3) LBS 263 or concurrently or approval of instructor.

Continuation of LBS 261L.

290. Directed Study

Fall, Winter, Spring. 1 to 6 credits. May reenroll for a maximum of 6 credits. Approval of school.

Faculty directed studies in curricular areas which are normally related to regular course offerings.

A. Directed Study—General

1 or 2 credits.

B. Directed Study—Biology

1 or 2 credits.

F. Directed Study—Computer Science

1 to 3 credits.

295. Independent Study

Fall, Winter, Spring. 1 to 4 credits. May reenroll for a maximum of 12 credits. Approval of school.

Student conceived individual courses of study in curricular areas. Preliminary faculty approval and continuing guidance.

A. Independent Study—General

B. Independent Study—Biology

361. *Philosophy of Technology*

Fall, Winter. 4(4-0) Sophomores or approval of school. Interdepartmental with the Department of Philosophy.

Is our technology desirable? Are its social forms desirable? What alternatives are there? Students will develop and defend their own appraisals of technology.

373. *Introduction to the Philosophy of Science*

Winter, Spring. 4(4-0) Juniors or approval of school.

Philosophical problems about the character and justification of scientific knowledge. Possible topics: concept formation, theory construction, scientific explanation, confirmation theory, 'logic' of discovery, philosophical implications of physical theories.

374. *Historical Problems in the Biological Sciences*

Fall, Winter. 4(4-0) Lyman Briggs or History juniors or approval of school. Interdepartmental with the Department of History.

Various themes or periods in the biological sciences. The course may emphasize the pattern of theoretical development, changes in explanatory ideals, the interaction of external factors and scientific ideas, etc.

375. *Historical Problems in the Physical Sciences*

Spring. 4(4-0) Juniors or approval of college.

Various themes or periods in the physical sciences. The course may emphasize the pattern of theoretical development, changes in explanatory ideals, the interaction of external factors and scientific ideas, etc.

376. *Historical Problems in Technical Change*

Fall, Spring. 4(4-0) Juniors or approval of school.

Factors which influence technical change. Exploration of both historical and contemporary problems of technology and technical change.

377. *The Natural Environment: Perceptions and Practices*

Spring. 4(4-0) Sophomores.

Factors which have influenced U.S. environmental attitudes as reflected in art and literature. Ways in which changing attitudes have led to changes in legislation and practice.

378. *Popular Culture and Technical Change*

Winter. 4(4-0) Juniors or approval of school. Interdepartmental with American Studies.

Interrelationships among elements of mass culture and technical change. Introduction to relevant research methods.

380. *Energy Issues*

Fall. 4(4-0) Juniors or approval of school.

History of development of American energy resources, history of American energy policy, and history of patterns of energy consumption. Energy resource forecasts. Environmental and social issues.

409. *History of Modern European and American Medicine*

Spring of odd-numbered years. 4(4-0) Juniors. Interdepartmental with and administered by the Department of History.

Ancient and medieval background, socio-economic and intellectual historical contexts, the clinical perspective, sectarian competition, institutionalization of scientific medicine, and comparative health policies and systems.

484. *Philosophy of Biological Sciences*

Winter, Spring. 4(4-0) Nine credits in science or approval of school. Interdepartmental with the Department of Philosophy.

Methodological notions and problems of the biological sciences such as: observation and measurement, classification, teleological and functional explanation, teleological systems, emergentism, vitalism, value neutrality.

490. *Directed Study*

Fall, Winter, Spring. 1 to 6 credits. May reenroll for a maximum of 12 credits. Juniors and approval of school.

Faculty directed studies in curricular areas which are normally related to regular course offerings.

A. Directed Study—General

B. Directed Study—Biology

C. Directed Study—Chemistry/Physics

E. Directed Study—Science and Technology Studies

491. *Senior Seminar I*

Fall, Winter, Spring. 4(4-0) Seniors or approval of school.

Selected problems in the study of science and technology as human activities, using philosophical, historical, literary, social science or interdisciplinary perspectives or methods. Thesis topic refined and outlined.

492. *Senior Seminar II*

Fall, Winter, Spring. 4(4-0) LBS 491 or written approval of instructor.

Research, write, defend and evaluate a significant thesis paper in science and technology studies or related interdisciplinary science problems.

493. *Field Experience*

Fall, Winter, Spring. 1 to 15 credits. May reenroll for a maximum of 16 credits. Approval of school.

Experiential learning related to the public or private practice of science and technology.

495. *Independent Study*

Fall, Winter, Spring. 1 to 12 credits. May reenroll for a maximum of 12 credits. Juniors and approval of school.

Student conceived individual courses of study in curricular areas. Preliminary faculty approval and continuing guidance.

A. Independent Study—General

B. Independent Study—Biology

C. Independent Study—Chemistry/Physics

E. Independent Study—Science and Technology Studies

MANAGEMENT MGT

College of Business and Graduate School of Business Administration

101. *Introduction to Business*

Fall, Winter, Spring. 4(4-0) Approval of department.

Functions performed by business and the role of administration in our economy as a whole and in the operation of a specific business. Four major objectives: to aid students in choosing a vocation, to help business majors select a field of concentration, to show the place of specialized techniques presented in more advanced business courses, and to give some familarity with common business practices and terminology.

302. *Organization and Management*

Fall, Winter, Spring, Summer. 4(4-0) Junior Business majors; EC 201, ACC 201.

Executive roles and functions in the business enterprise and other goal directed institutions; organization design; organization/environment interaction; analysis of internal organization structure; leadership, motivation, conflict, organization change and development.

303. *Materials and Logistics Management*

Fall, Winter, Spring, Summer. 4(4-0) Juniors in the College of Business or approval of department. Interdepartmental with the Department of Marketing and Transportation Administration.

Management concepts and techniques for purchasing, operations and distribution processes. Productivity and profit contributions. Planning, analysis and control of purchasing, production and transportation-distribution.

304. *Operations Planning and Control*

Winter, Spring. 4(4-0) MGT 303 or approval of department. Interdepartmental with the Department of Marketing and Transportation Administration.

Managing the production system. Product development, process selection, facilities location and layout; staffing; materials, cost and quality control.

305. *Purchasing Management*

Fall, Winter, Spring. 4(4-0) MGT 303 or approval of department. Interdepartmental with the Department of Marketing and Transportation Administration.

Planning, organizing and controlling the purchasing function within organizations. Purchasing responsibilities, objectives and policies. Source selection and evaluation. Price, cost and value analysis. Negotiation. Managing purchase inventories.

306. *Analysis of Processes and Systems*

Fall, Winter, Spring. 4(4-0) CPS 115, MTA 317 or concurrently.

Analysis of some fundamental systems and process concepts which are basic to industrial management. The course is oriented toward computer model building, acquainting the student with the use of the computer as an instrument for analysis of complex problems in industry. Course includes consideration of criteria for efficiency and optimization, and program planning.