

**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)*  
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 Solov'yev.

**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 credit.* Approval of department.

**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.

**140. Biology I**

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

Organismal biology. Basic principles of genetics, evolution, systematics, populations and ecology.

**141. Biology II**

*Winter, 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.

**142. Biology IA**

*Spring. 1 to 2 credits. May reenroll for a maximum of 4 credits. LBS 140.*

Selected problems such as analysis of biological data, interspecific and intraspecific competition, microarthropods 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.

**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.

## Descriptions — Lyman Briggs School

of

### Courses

**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, Spring. 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.

**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.

B. Independent Study—Biology

**361. Philosophy of Technology**  
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. 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. 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 school.

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. 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**  
Fall. 4(4-0) Sophomores. Interdepartmental with American Studies.

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**  
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

E. Independent Study—Science and Technology Studies

**310. Fundamentals of Personnel Management**

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

Formulation and administration of employee relations policies in the business enterprise; human resource utilization; introduction to personnel staffing, training and development, performance appraisal, compensation, and labor relations.

**341. Transportation Systems**

Fall, Winter. 4(4-0) MGT 303 or MTA 301. Interdepartmental with and administered by the Department of Marketing and Transportation Administration.

Application of economic and business principles to transportation and distribution systems, functional analysis of all major transport modes. Identification of major issues, analysis of alternatives and discussion of probable future outcomes.

**345. Physical Distribution and Channel Strategy**

Fall, Winter. 4(4-0) MGT 303 or MTA 301. Interdepartmental with and administered by the Department of Marketing and Transportation Administration.

Micro analysis of private and public physical distribution channel systems. Emphasis on the physical and behavioral components of the channel including analytical tools used in planning, implementing and controlling the system.

**403. Research and Negotiation for Purchasing Materials and Management**

Fall, Winter, Spring. 4(4-0) MGT 305 or approval of department. Interdepartmental with the Department of Marketing and Transportation Administration.

Applied research and planning focusing on the purchasing and materials management functions in organizations. Preparation for and conducting purchase negotiations. Field research studies. Administration of the research and planning effort.

**405. Operations Management Topics**

Fall, Winter, Spring. 4(4-0) MGT 304 or approval of department. Interdepartmental with the Department of Marketing and Transportation Administration.

Consideration of current and controversial questions in operations management. Field experience to study operations and policies in business. Industry studies; impact of new technology and government regulations.

**407. Materials and Logistics Policy**

Winter, Spring. 4(4-0) MGT 303 plus 12 credits in MLM Program. Interdepartmental with and administered by the Department of Marketing and Transportation Administration.

Analysis of comprehensive cases incorporating topical coverage of the entire materials and logistics management program.

**409. Business Policy**

Fall, Winter, Spring, Summer. 4(4-0) Seniors in business administration, MGT 302; FI 391; MTA 300.

Problems, methods, and analytical frameworks for building and maintaining consistent and effective policy frameworks in the business enterprise. Written and oral analyses are made of comprehensive cases cutting across the major functions within business organizations. Team and individual reports are required.

**411. Staffing the Organization**

Fall. 4(4-0) MGT 310; MTA 317.

Job design; job analysis; employment planning; recruitment, selection, and placement; employment interviewing and testing; validation of selection procedures; affirmative action constraints; EEOC guidelines; induction and orientation of employees.

**412. Appraisal, Compensation and Benefits**

Winter. 4(4-0) MGT 310.

Wage and salary administration; job evaluation; employee motivation; performance appraisal; relating pay to performance; financial and non-financial incentives; equity considerations; employee benefits.

**413. Occupational Safety and Health Administration**

Fall, Winter. 4(4-0) Juniors; MGT 302 for majors.

Programs and procedures for control of work accidents and maintenance of health in business and other organizations. Analysis of costs related to employee and product safety. Administration of a safety program in compliance with new Federal law.

**415. Managerial Approaches to Collective Bargaining**

Winter, Spring. 4(4-0) MGT 302 or Junior non-business majors.

Union-management problems and managerial strategy and tactics in collective bargaining—the union challenge, legal constraints, negotiations and operating under the contract, dimensions of cooperation and conflict.

**417. Minorities and Women in the World of Work**

Fall, Spring. 4(4-0) Senior majors or approval of department. Interdepartmental with the School of Social Work.

Racial, ethnic, sexual and other minority experiences and problems in the world of work. Awareness training approach (what it's like to be ...) featuring movies, guests, subgroup discussions and encounter-type exercises.

**419. Group Dynamics and Organization Development**

Spring. 4(4-0) MGT 302. Students may not receive credit in both MGT 419 and PSY 356.

Group dynamics and development; organizational diagnosis; assessment of work attitude and organization climate; organization development goals and methods; action research, survey feedback, team building, conflict management; evaluating organization development activities.

**426. Personnel Training and Individual Development**

Fall. 4(4-0) MGT 310.

The training and development function; career stages and career planning; needs analysis; training and individual development techniques; evaluation of training and employee development programs.

**442. Traffic and Transportation Management**

Winter, Spring. 4(4-0) MGT 303, MTA 341, MTA 345. Interdepartmental with and administered by the Department of Marketing and Transportation Administration.

Basic practices related to purchasing and operating transportation services for private and public enterprises.

**MANAGEMENT**

**MGT**

**College of Business and Graduate School of Business Administration**

**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.