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  
Continuation 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 101 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 425.  
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. 1 to 8 credits.  
May reenroll for a maximum of 15 credits. Approval of department.  
Work in areas outside regular course offerings.

800. Teaching Methods of Russian in College  
Fall, Winter, Spring. 0 to 3 credits.  
Graduate teaching assistant.  
Supervised teaching of college classes in Russian.

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.

915. Russian Literature Before 1800  
Fall of even-numbered years. 3(3-0)  
Origin and development of Russian Literature up to 1800. Emphasis on major works and authors of the period.

917. 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 Tonui, Grboy-dov, 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 1880. Emphasis on major poetry by Zhukovsky, Batyushkov, Pushkin, Baratynsky, Yaeykov, 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.

981. Seminar in Slavic Studies  
Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 15 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 38 credits.

LYMAN BRIGGS — Descriptions of Courses

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, or MTH 112 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 current 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  
Winter, Spring. 4(3-3) Not open to students with credit in B S 212.  
The organism and their environment. Organis­

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.

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, microarthropods inhabiting leaf litter, spring flora, diversity, stability and evolution of natural communities.
160. Physics—Elementary Concepts
   Winter. 1(2-0) LBS 163 or concurrently.
   Elementary concepts of mechanics, electricity, magnetism and optics.

161. Introduction to Chemistry and Physics I
   Fall. 3(4-0) MTH 105 or MTH 106 or MTH 111 concurrently; LBS 111L 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 112.
   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.

232. Science and Technology Studies: Writing II
   Fall. Winter. Spring. 4(4-0) LBS 131; sophomore.
   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 3 credits. LBS 230.
   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(2-3) LBS 141. Not open to students with credit in B 5211.
   Organismal growth and development from molecular genetics through life cycles of selected plant and animal species.

258. 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 and 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
   C. Independent Study—Chemistry/Physics
   E. Independent Study—Science and Technology Studies

333. Modern Poetry
   Spring. 4(4-0) LBS 132 or LBS 131 with 3.0 or better.
   Recent poetry of literary and social nature. Students may submit original poetry in partial fulfillment of course writing requirements. Approved through Winter 1986.

361. Philosophy of Technology
   Fall. Winter. 4(4-0) Sophomore 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) Juniors or approval of school.
   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.  
Examination of the role of technology in society and its impact on culture, economics, and politics.  
May reenroll for a maximum of 16 credits.  

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.

493. **Field Experience**  
Fall, Winter, Spring; 1 to 15 credits. May reenroll for a maximum of 16 credits. Approval of instructor.  
Experimental learning related to the public or private practice of science and technology.

494. **Independent Study**  
Fall, Winter, Spring; 1 to 12 credits. May reenroll for a maximum of 12 credits. Approval of advisor.  
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**  

D. **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 familiarity with common business practices and terminology.

201. **Senior Seminar I**  
Fall, Winter, Spring; 4(4-0) Juniors 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.  

202. **Senior Seminar II**  
Fall, Winter, Spring; 4(4-0) or written approval of instructor.  
Research, write, defend and evaluate a significant thesis in science and technology studies or related interdisciplinary science problems.  

301. **Organizational 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.

302. **Organization and Management**  
Fall, Winter, Spring, Summer; 4(4-0) or approval of department.  
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; 4(4-0) Interdepartmental with the Department of Marketing and Transportation Administration.  
Management of the distribution system. Product development, process selection, facilities location and layout; staffing; materials, cost and quality control.

304. **Operations Planning and Control**  
Winter, Spring, Summer; 4(4-0) MGT 303 or approval of department.  
Interdepartmental with the Department of Marketing and Transportation Administration.  

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

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 simulation.  

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 Distribution Systems**  
Fall, Winter, Spring; 4(4-0) MGT 303 or approval of department. Interdepartmental with the Department of Marketing and Transportation Administration.  
Application of transportation and distribution systems, functional analysis of all major transport modes. Identification of major issues, analysis of alternative and discussion of probable future outcomes.

342. **Traffic Management**  
Fall, Winter, Spring; 4(4-0) MGT 303 or approval of department. Interdepartmental with the Department of Marketing and Transportation Administration.  
Basic practices related to purchasing and operating transportation services for private and public enterprises.

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 in study operations and policies in business. Industry studies; impact of new technology and government regulations.

406. **Introduction to Management Science**  
Fall, Winter, Spring; 4(4-0) MGT 306.  
Quantitative models and techniques applied to various business problems integrating the computer into the problem solving process. Topics include linear programming, integer programming, dynamic programming, queuing problems, Bayesian Decision Theory, theory of games.