

LINGUISTICS

- 850*.** **Advanced Studies in Child Language Acquisition**
Spring of even-numbered years. 3(3-0)
May reenroll for a maximum of 6 credits.

P: LIN 450 R: For reenrollment-approval of department

Selected topics on children's native language acquisition. Research methods, crosslinguistic data, explanations from linguistic theory. Representative topics: learnability, parameters, innateness, narratives, individual variation, bilingualism
QP: LIN 410 QA: LIN 810

- 861*.** **Advanced Studies in Second Language Acquisition**
Spring. 3(3-0) May reenroll for a maximum of 6 credits.

Interdepartmental with the Department(s) of English.
P: ENG/LIN 461 or permission of department

Research, current issues and theories of second and foreign language acquisition. Role of aspects of language structure personality and general cognition. Methods of research.
QP: LIN 401 QA: LIN 861

- 871*.** **Advanced Studies in Sociolinguistics**
Spring. 3(3-0) May reenroll for a maximum of 6 credits.

Linguistic and social-psychological bases for language choice. Topics and approaches exemplifying modern general sociolinguistic including concerns of power, politeness and gender, quantitative microsociolinguistics and ethnomethodology.
QP: LIN 415 QA: LIN 815

- 890*.** **Independent Study**
Fall, Spring, Summer. 1 to 4 credits.
May reenroll for a maximum of 8 credits.

R: Approval of the Department
Special projects, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.
QA: LIN 860

- 891*.** **Special Topics**
Fall, Spring, Summer. 1 to 4 credits.
May reenroll for a maximum of 8 credits.

R: Approval of the Department
Special topics supplementing regular course offerings proposed by faculty on a group study basis for graduate students.

- 892*.** **Seminar in Linguistics**
Spring. 3(3-0) May reenroll for a maximum of 12 credits.

R: linguistics approval of department
Presentation and discussion of original research by the instructor, students and others.
QA: LIN 880

- 898*.** **Master's Research--Plan B**
Fall, Spring, Summer. 1 to 3 credits.
May reenroll for a maximum of 3 credits.

R: Approval of the Department
Directed research in support of plan B master's degree requirements.

- 899*.** **Master's Thesis Research--Plan A**
Fall, Spring, Summer. 1 to 6 credits.
May reenroll for a maximum of 6 credits.

R: Approval of the Department
Directed research leading to a master's thesis, used in partial fulfillment of plan A master's degree requirements.
QA: LIN 899

- 999*.** **Doctoral Dissertation Research**
Fall, Spring, Summer. 1 to 6 credits.
May reenroll for a maximum of 36 credits.

R: Approval of the Department

QA: LIN 999

LYMAN BRIGGS SCHOOL LBS

- 117*.** **College Algebra and Trigonometry**
Fall. 3(3-0)

R: Open only to Lyman Briggs School majors. Designated score on mathematics placement test. Not open to students with credit in MTH 110 or MTH 116 or MTH 120.

Rational and real numbers. Functions and inverses. Equations, simultaneous equations. Inequalities. Graphing. Trigonometry.

QP: NONE QA: LBS 111 MTH 111

- 118*.** **Calculus I**

Fall, Spring. 5(5-0)
P: LBS 117 or MTH 110 or MTH 116 or designated score on mathematics place <F

R: Open only to Lyman Briggs School majors. Not open to students with credit in MTH 120 or MTH 124 or MTH 132 or MTH 152H.

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

QP: LBS 111 MTH 109MTH 111 QA: LBS 112 MTH 112 LBS 113 MTH 113

- 119*.** **Calculus II**

Fall, Spring. 4(4-0)
P: LBS 118. R: Open only to Lyman Briggs School majors. Not open to students with credit in MTH 133 or MTH 153H or MTH 235.

Continuation of LBS 118. Further applications of one variable calculus. Infinite series. Ordinary differential equations.

QP: LBS 113 MTH 113 QA: LBS 113 MTH 113 LBS 217 MTH 215

- 125*.** **Introduction to C Language with Applications**
Spring. 3(3-0)

P: LBS 118. R: Open only to Lyman Briggs School majors. Not open to students with credit in CPS 130 or CPS 131 or CPS 230.

Computer programming using the C language and the UNIX operating system. Emphasis on scientific and mathematical applications.

QP: MTH 112 ORLBS 112

- 126*.** **Personal Computers and Networks**
Fall, Spring. 3(3-0)

R: Open only to Lyman Briggs School majors. Not open to students with credit in CPS 100. Selecting, installing and using personal computer software and hardware. Computer networks.

- 127*.** **Introduction to FORTRAN Language with Applications**
Fall. 3(3-0)

P: LBS 118. R: Open only to Lyman Briggs School majors. Not open to students with credit in CPS 131.

Computer programming using the FORTRAN language and the UNIX operating system with emphasis on scientific and mathematical applications.

- 133*.** **Introduction to Science and Technology Studies**

Fall, Spring. 4(4-0)
R: Open only to Lyman Briggs School majors.

Instruction and practice in expository writing. Paper and report topics drawn from readings in the history, philosophy, and other areas of science and technology.

QA: LBS 131 LBS 232

- 144*.** **Biology I: Organismal Biology**
Fall, Spring. 4(3-3)

R: Open only to Lyman Briggs School majors. 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.
QA: LBS 140 BS 212

- 145*.** **Biology II: Cellular and Molecular Biology**

Fall, Spring. 4(3-3)
P: LBS 144; CEM 141 or CEM 151 or CEM 181H or LBS 165. R: Open only to Lyman Briggs School majors. Not open to students with credit in BS 111.

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

QP: LBS 140 QA: LBS 141 LBS 242 BS 210 BS 211

- 164*.** **Introduction to Physics and Chemistry I**
Fall. 3(4-0)

P: LBS 117 or concurrently or MTH 116. R: Open only to Lyman Briggs School majors. Not open to students with credit in PHY 181B or PHY 183 or PHY 183B or PHY 231 or PHY 231B.

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

QP: MTH 109 MTH 111LBS 111 QA: LBS 162 LBS 261 PHY 237 PHY 281

- 164L*.** **Introductory Physics Laboratory I**
Fall. 1(0-3)

P: LBS 164 or concurrently. R: Open only to Lyman Briggs School majors. Not open to students with credit in PHY 192 or PHY 251.

Techniques and instruments in the physics laboratory. Selected experiments in classical and modern physics.
QA: LBS 162L LBS 261L PHY 257 PHY 259 PHY 297

- 165*.** **Introduction to Chemistry and Physics I**
Spring. 3(4-0)

P: LBS 164. R: Open only to Lyman Briggs School majors. Not open to students with credit in CEM 141 or CEM 152 or CEM 182H.

Chemical principles: structure and bonding, periodic properties. Stoichiometry, states of matter. Solutions, acids and bases, equilibria. Thermodynamics, kinetics.
QA: LBS 161 LBS 163 CEM 141 CEM 151 CEM 152

- 165L*.** **Introductory Chemistry Laboratory I**
Spring. 1(0-3)

P: LBS 165 or concurrently. R: Open only to Lyman Briggs School majors. Not open to students with credit in CEM 161 or CEM 185H.

Determination of density and molecular weight. Stoichiometry. Acid-base titration, redox titration. Reaction kinetics, thermochemistry, Beer's law, freezing point depression, and equilibrium constants.
QA: LBS 161L LBS 163L CEM 161

- 220*.** **Calculus III**
Fall, Spring. 5(5-0)

P: LBS 119. R: Open only to Lyman Briggs School majors. Not open to students with credit in MTH 234 or MTH 235 or MTH 254H or MTH 255H.

Continuation of LBS 119. Three-dimensional vector geometry, differential calculus of functions of two or three variables. Double and triple integrals, line integrals.

QP: LBS 113 MTH 113 QA: LBS 216 LBS 217 MTH 214 MTH215

LYMAN BRIGGS SCHOOL

239*. **Topics in Science and Technology Studies**
 Fall, Spring. 4(4-0)
 P: LBS 133. R: Open only to Lyman Briggs School majors.
 Topics in history, sociology, and philosophy of science and technology. Science policy.
 QP: LBS 131

246*. **Experimental Projects in Biology**
 Spring. 1 to 3 credits. May reenroll for a maximum of 5 credits.
 P: LBS 145 or BS 111; LBS 133 or ATL 110. R: Open only to Lyman Briggs School majors.
 Experiments, field studies. Selected problems in biology such as cell structure and metabolism, diversity, stability, evolution of natural communities, and reproductive biology.
 QP: LBS 140 LBS 141 QA: LBS 142

266*. **Introduction to Chemistry and Physics II**
 Fall. 3(4-0)
 P: LBS 118 or concurrently, LBS 165. R: Open only to Lyman Briggs School majors. Not open to students with credit in CEM 142 or CEM 151 or CEM 181H.
 Spectroscopy and symmetry. Coordination chemistry, solubility and stability constants. Electrochemistry, main group chemistry, atmospheric chemistry, organometallic chemistry. Polymers.
 QP: LBS 161 CEM 141CEM 152 QA: LBS 262 CEM 153

266L*. **Introductory Chemistry Laboratory II**
 Fall. 1(0-3)
 P: LBS 165L, LBS 266 or concurrently. R: Open only to Lyman Briggs School majors. Not open to students with credit in CEM 162.
 Synthesis and characterization of chemical systems.
 QP: LBS 163 LBS 163L QA: LBS 262L CEM 162 CEM 163

267*. **Introduction to Physics and Chemistry II**
 Spring. 3(4-0)
 P: LBS 118, LBS 164. R: Open only to Lyman Briggs School majors. Not open to students with credit in PHY 182B or PHY 184 or PHY 184B or PHY 232 or PHY 232B or PHY 294H.
 Principles of electromagnetic theory, special relativity, quantum physics, optics, atomic and subatomic physics.
 QP: LBS 261 PHY 237PHY 237BPHY 281 QA: LBS 162 LBS 263 PHY 238 PHY 238B PHY 239

267L*. **Introductory Physics Laboratory II**
 Spring. 1(0-3)
 P: LBS 164L; LBS 267 or concurrently. R: Open only to Lyman Briggs School majors. Not open to students with credit in PHY 192 and PHY 252.
 Selected experiments in classical and modern physics.
 QP: LBS 162LPHY 257PHY297 QA: LBS 261L LBS 263L PHY 258 PHY 259 PHY 298

290A*. **Directed Study-Multidisciplinary**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Open only to Lyman Briggs School majors.
 Directed studies involving at least two Lyman Briggs School curricular areas: biology, chemistry, physics, mathematics, science and technology, computer science.
 QA: LBS 290A

290B*. **Directed Study--Biology**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Open only to Lyman Briggs School majors.
 Directed studies in biology.
 QA: LBS 290B

290C*. **Directed Study--Chemistry/Physics**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Open only to Lyman Briggs School majors.
 Directed studies in chemistry and physics.

290D*. **Directed Study--Mathematics**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Open only to Lyman Briggs School majors.
 Directed studies in mathematics.

290E*. **Directed Study--Science and Technology Studies**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Open only to Lyman Briggs School majors.
 Directed study in science and technology studies.

290F*. **Directed Study--Computing**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Open only to Lyman Briggs School majors.
 Directed studies in computing.
 QA: LBS 290F

331*. **Philosophy of Technology**
 Spring. 4(4-0) Interdepartmental with the Department(s) of Philosophy.
 R: Sophomores and above
 Is our technology desirable? Are its social forms desirable? What alternatives are there? Explores conventional productivist, ecological progressive, radical humanist outlooks. Students develop, defend own views.
 QP: LBS 232 QA: LBS 361

332*. **Technology and Culture**
 Fall. 4(4-0) Interdepartmental with the Department(s) of American Studies.
 P: LBS 133 R: Juniors and above
 History of technology with special emphasis on the interaction of technical innovation and other elements of culture.
 QP: LBS 232 QA: LBS 376 LBS 378

333*. **Topics in History of Science**
 Fall, Spring. 4(4-0) May reenroll for a maximum of 8 credits.
 R: Open only to junior and senior Lyman Briggs School majors.
 Various themes or periods in physical/biological science. May emphasize patterns of theory development, changes in explanatory aims and standards or interaction of social/cultural factors with scientific ideas, practices, instrumentation or experimental

334*. **Science, Technology and Public Policy**
 Spring. 4(4-0)
 P: LBS 133. R: Not open to freshmen.
 Open only to Lyman Briggs School majors.
 Science and technology in public policy formation considered from the perspectives of the history, philosophy, and sociology of science and technology.
 QP: LBS 232 QA: LBS 374 LBS 375

335*. **The Natural Environment: Perceptions and Practices**
 Spring. 4(4-0) Interdepartmental with the Department(s) of American Studies.
 R: Sophomores and above LBS or AMS students only
 American attitudes toward the natural environment and the public and private institutions that relate to them.
 QP: LBS 232 QA: LBS 377

347*. **Advances in Applied Biology**
 Fall. 3(2-3)
 P: ATL 110 or LBS 133; BS 111 or LBS 145. R: Not open to freshmen and sophomores. Open only to Lyman Briggs School majors.
 Advances in cell and molecular biology and application: plant and animal breeding, environment, and therapeutics.
 QP: LBS 242 BS 210BS 211BS 212

470*. **Clarion Science Fiction and Fantasy Writers' Workshop**
 Summer. 4(-)
 R: Approval of school; application required.
 A six week, intensive workshop for science fiction writers early in their careers. Taught by professional writers and directed by MSU faculty. Competitive admission based on review of applicant manuscripts. Enrollment limited to 15-18.
 QA: LBS 470

490A*. **Advanced Directed Study--Multidisciplinary**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Not open to freshmen and sophomores.
 Open only to Lyman Briggs School majors.
 Directed advanced studies involving at least two LBS curricular areas: biology, chemistry, physics, mathematics, science and technology studies, computing.
 QA: LBS 490A

490B*. **Advanced Directed Study--Biology**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Not open to freshmen and sophomores.
 Open only to Lyman Briggs School majors.
 Directed advanced studies in biology.
 QA: LBS 490B

490C*. **Advanced Directed Study--Chemistry or Physics**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Not open to freshmen and sophomores.
 Open only to Lyman Briggs School majors.
 Directed advanced studies in chemistry or physics.
 QA: LBS 490C

490D*. **Advanced Directed Study--Mathematics**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Not open to freshmen and sophomores.
 Open only to Lyman Briggs School majors.
 Directed advanced studies in mathematics.

490E*. **Advanced Directed Study--Science and Technology Studies**
 Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 8 credits.
 R: Not open to freshmen and sophomores.
 Open only to Lyman Briggs School majors.
 Directed advanced studies in Science and Technology Studies.
 QA: LBS 232

492*. **Senior Seminar**
 Fall, Spring. 4(4-0)
 P: LBS 331 or LBS 332 or LBS 333 or LBS 334 or LBS 335. R: Not open to freshmen and sophomores. Open only to Lyman Briggs School majors.
 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.
 QA: LBS 491 LBS 492

LYMAN BRIGGS SCHOOL

493*. Field Experience
 Fall, Spring. 1 to 10 credits. May reenroll for a maximum of 10 credits.
 R: Not open to freshmen and sophomores.
 Open only to Lyman Briggs School majors.
 Experiential learning related to the public or private practice of science and technology.
 QA: LBS 493

MANAGEMENT MGT

302*. Management and Organizational Behavior
 Fall, Spring, Summer. 3(3-0)
 P: EC 201 or 251H; ACC 201 or ACC 230 or ACC 251H R: Juniors and Seniors Business or Program for which MGT 302 is ctyg-listed req.
 Managerial roles and functions in goal directed institutions; organization design, analysis of organizational structure; leadership, motivation, work attitudes, conflict management, and managing diversity.
 QP: ACC 201 ACC 230ACC 251HEC 201EC 251H
 QA: MGT 302

303*. Materials and Logistics Management
 Fall, Spring, Summer. 3(3-0)
 Interdepartmental with the Department(s) of Marketing and Transportation Administration.
 P: EC 201 or EC 251H; ACC 202 or ACC 230 or ACC 251H R: Juniors and Seniors Business or program for which MGT 303 is catalog requirement
 Role of manufacturing/operations, purchasing/sourcing and transportation/distribution in determining the competitiveness of manufacturing and service enterprises with respect to quality, flexibility, cost and lead time.
 QP: ACC 202 ACC 230ACC 251HEC 201EC 251H
 QA: MGT 303

304*. Operations and Purchasing Management
 Fall, Spring, Summer. 3(3-0)
 Interdepartmental with the Department(s) of Marketing and Transportation Administration.
 P: MGT 303 or MTA 303 R: Juniors and Seniors Business or program which MGT 304 is catalog requirement
 Overview of Operations and Purchasing Management functions in an organization; materials management tactical issues in implementing internal and external resource plans.
 QP: MGT 303 QA: MGT 304 MGT 305

306*. Decisions Making Models
 Spring. 3(3-0)
 P: MTA 317, MTH 120 or equivalent R: Juniors and Seniors Business
 Basic analytical techniques used for analyzing business decision situations; optimal resource allocation decision models, forecasting and planning, computer simulation decision analysis under risk, project management, use of computer software.
 QP: MTA 317 QA: MGT 306

310*. Human Resource Management
 Fall, Spring, Summer. 3(3-0)
 P: MGT 302 or concurrently R: Juniors and Seniors Business and programs which MGT 310 is catalog requirement
 Formulation and administration of human resource policies in the business enterprise. Manpower plng, job anal/eval, staffing, compensation/labor relations, employee safety. Training, development, performance appraisal. Issues of diversity and ethics
 QP: MGT 302 QA: MGT 310

401*. Procurement and Supply Management
 Fall, Spring, Summer. 3(3-0)
 Interdepartmental with the Department(s) of Marketing and Transportation Administration.
 P: MGT 304 or MTA 304; MTA 345 or MGT 345 R: Juniors and Seniors Business or program for which MGT 401 is catalog requireme
 Strategic issues in procurement and supply management dealing with management of the purchasing process, the procurement cycle, purchasing research, buyer/supplier relationships, negotiation, commodity planning, cost/price analysis and value analysis.
 QP: MGT 303 QA: MGT 403

402*. Manufacturing Planning and Control
 Fall, Spring, Summer. 3(3-0)
 Interdepartmental with the Department(s) of Marketing and Transportation Administration.
 P: MGT 304 or MTA 304, MTA 345 or MGT 345 R: Juniors and Seniors Business
 Theory and practice for planning and controlling manufacturing operations; production planning, demand mgmt, masterscheduling, matls requirements and capacity planning, shop floor control, computer integrated manufacturing, and Just-In-Time systems.
 QP: MGT 304 QA: MGT 405

403*. Topics in Purchasing/Sourcing Management
 Fall of even-numbered years. 3(3-0)
 Interdepartmental with the Department(s) of Marketing and Transportation Administration.
 P: MGT 304 or MTA 304, MTA 345 or MGT 345 R: Juniors or Seniors Business
 Advanced coverage of sourcing and negotiation strategy development processes, sourcing strategies, price and cost analysis, purchasing research techniques and other current issues and trends.
 QP: MGT 305

404*. Topics in Operations Management
 Spring of odd-numbered years. 3(3-0)
 Interdepartmental with the Department(s) of Marketing and Transportation Administration.
 P: MGT 304 or MTA 304, MTA 345 or MGT 345 R: Juniors or Seniors Business
 Advanced coverage of operations management topics of current interest such as total quality management, computer integrated manufacturing, simultaneous engineering, and other current issues and trends.
 QP: MGT 304

409*. Business Policy and Strategic Management(W)
 Fall, Spring, Summer. 3(3-0)
 P: MGT 302, MGT 303, FI 311, and MTA 300 R: Senior Business
 Techniques for building and maintaining consistent and effective policy/strategy frameworks in the business enterprise, cutting across the major functions within a firm: strategic integration, ethica, and international competition.
 QP: MGT 302 FI 391MTA 300 QA: MGT 409

411*. Organizational Staffing
 Fall. 3(3-0)
 P: MGT 310 or concurrently R: Juniors and Seniors Business and programs which MGT 411 is catalog requirement
 Job and organizational analysis, manpower planning, recruitment, selection and placement, employment interviewing and testing; validation of selection procedures, EEO guidelines, affirmative action, diversity, and ethics issues,
 QP: MGT 310 QA: MGT 411

412*. Compensation and Reward Systems
 Spring. 3(3-0)
 P: MGT 310 or concurrently R: Juniors and Seniors Business and programs which MGT 412 is catalogue requirement
 Designing compensation systems; job evaluation, internal and external equity, pay-for-performance plans, financial incentives, intrinsic and extrinsic motivation, wage/salary surveys, benefits administration; diversity and ethical considerations.
 QP: MGT 310 QA: MGT 412

413*. Personnel Training and Development
 Spring. 3(3-0)
 P: MGT 310 or concurrently R: Juniors and Seniors Business and programs which MGT 413 is catalogue requirement
 Designing and implementing training and development programs; career stages and career planning; needs analysis; experimental design and program evaluation; learning theories; diversity and ethics issues.
 QP: MGT 310 QA: MGT 426

414*. Diversity in the World of Work
 Fall. 3(3-0)
 P: MGT 310 or concurrently R: Juniors and Seniors Business and programs which MGT 414 is catalogue requirement
 Racial, ethnic, sexual, physically handicapped, and other minority experiences and problems in work organizations. Awareness training for managers of a diverse work force. Ethical issues.
 QP: MGT 310 QA: MGT 417

415*. Special Topics in Human Resource Management
 Spring of even-numbered years. 3(3-0)
 P: MGT 310 or concurrently R: Juniors and Seniors Business and programs which MGT 415 is catalogue requirement
 Undergraduate seminar on topics of interest to specialists in human resource management. Topics will include advanced organizational behavior, managing labor relations, organizational development, organizational theory and design.
 QP: MGT 310 QA: MGT 419 MGT 415 MGT 413

493*. Field Studies
 Fall, Spring, Summer. 1 to 3 credits.
 May reenroll for a maximum of 6 credits.
 R: Seniors Management Approval of Department
 Planned program of observation, study, and work in selected business firms, to supplement classroom study contributing to total overall educational experience. Independent research on special topics in Management.
 QA: MGT 468

800*. Materials and Logistics Management
 Fall, Spring. 3(3-0)
 Interdepartmental with the Department(s) of Marketing and Transportation Administration.
 R: Graduate Business
 Fundamentals of materials and logistics management, emphasizing the strategic impact of the transformation process in a global economy. Topics: quality, inventory mgmt, logistics strategy, customer service, international procurement, mgmt of technology.
 QA: MGT 800