



LYMAN BRIGGS COLLEGE

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DEAN

The Lyman Briggs College is a residential college that bridges the science and humanities through interdisciplinary teaching and research. It provides students with a fundamental core science education in mathematics, chemistry, biology, and physics. Additionally, the core program addresses historical, philosophical, and societal concerns and consequences of modern science, technology, the environment, and medicine. Advanced undergraduate courses in the student's major are taken in the respective departmental units of the College of Natural Science, College of Engineering, College of Agriculture and Natural Resources, and the University at large. The majority of Lyman Briggs students pursue programs leading to advanced graduate study in the natural sciences, or professional programs related to medicine, dentistry, veterinary medicine, allied health, education or law. Many other students plan to enter careers in teaching at the secondary level, science writing, product representation, industry, or government service upon completion of their Bachelor of Science degree.

As a residential college, Lyman Briggs College has classrooms, laboratories, faculty offices, academic advisor offices, and administrative offices located in Holmes Hall, where all first year and many upper-level Lyman Briggs students live and learn. Because of this residential organization, students are able to develop a strong living-learning community identity by integrating academic and personal development, with faculty, staff and their peers in residence. Students are encouraged to balance their academic lives with social, cultural, athletic, service-learning, and leadership opportunities on campus and in the greater East Lansing community.

Students admitted to Michigan State University are admissible to Lyman Briggs College based initially on application date. There are no additional academic or program requirements for freshman admissions. Enrollment in the college is limited; therefore students are encouraged to apply early. Applicants should indicate their intention to become a part of the Lyman Briggs College on the Michigan State University Application for Admissions. If a student has already submitted an application and would like to ap-

ply to Lyman Briggs College, she/he should contact the Office of Admissions directly as early as possible.

Students work closely with their academic advisors and faculty in developing an individualized academic plan. All students enter the program as 'no major' status and may declare a major as early as summer orientation or by the time they have earned 56 credit hours.

Lyman Briggs College offers two minors: Bioethics; and History, Philosophy and Sociology of Science. Lyman Briggs College also participates in two minors: Entrepreneurship and Innovation; and Science, Technology, Environment, and Public Policy.

Students who are enrolled in the environmental biology/microbiology and microbiology coordinate majors in Lyman Briggs College may elect the Minor in Food Processing and Technology. For additional information, refer to the *Minor in Food Processing and Technology* statement in the *Department of Food Science and Human Nutrition* statement in the *College of Agriculture and Natural Resources* section of this catalog.

Admission as a Freshman to Lyman Briggs College

Any student who meets the general requirements for admission to the university as shown in the *Undergraduate Education* section of this catalog may enroll in Lyman Briggs College, pending available space.

Transfer Students

All students in good academic standing in Lyman Briggs College may transfer at any time to other programs at Michigan State University for which they are eligible, in order to accommodate changing academic needs and interests.

Students who wish to transfer into Lyman Briggs College should contact the Academic Affairs Office to make an appointment to consult with the Admissions Coordinator. Space in Lyman Briggs College is limited.

UNDERGRADUATE PROGRAM

The Lyman Briggs College program leads to the Bachelor of Science Degree.

Requirements for the Bachelor of Science Degree in Lyman Briggs College

- The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this University catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Lyman Briggs College.

Students who are enrolled in Lyman Briggs College may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading *Graduation Requirements* in the College statement. Certain courses referenced in requirement 3. below are equivalent to courses in the alternative track and, therefore, may be used to satisfy the alternative track.

The completion of the Lyman Briggs College mathematics and statistics requirement [referenced in item 3.c.(4) below] may also satisfy the University mathematics requirement.

The completion of Lyman Briggs 133 or one of the approved alternatives [referenced in requirement 3.a.(5)(a) below] may also be counted toward the University Tier I writing requirement.

The University's Tier II writing requirement for the Major and Coordinate Majors in Lyman Briggs College is met by completing Lyman Briggs College 492 and one of the following courses: Lyman Briggs College 321A, 321B, 322A, 322B, 323A, 323B, 324A, 324B, 325A, 325B, 326A, 326B, 327A, or 327B. Those courses are referenced in items 3. a. (5) and 3. a. (6) below.
- The requirements of Lyman Briggs College for the Bachelor of Science degree, referenced in item 3. a. below.

The credits earned in certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.
- The following requirements of Lyman Briggs College for the Bachelor of Science degree:

	CREDITS
a. CORE PROGRAM	48 to 57
(1) Biology: One of the following groups of courses (8 to 10 credits):	
(a) Lyman Briggs 144, 145.	
(b) Biological Science 181H, 191H, 182H, 192H.	
(c) Biological Science 161, 171, 162, 172.	
(2) Chemistry: One of the following groups of courses (8 to 10 credits):	
(a) Lyman Briggs 171, 171L, 172, 172L.	
(b) Lyman Briggs 171, 171L; Chemistry 143	
(c) Lyman Briggs 171, 171L; Chemistry 251.	
(d) Chemistry 141, 142, 161.	
(e) Chemistry 141, 143, 161.	
(f) Chemistry 141, 161, 251.	
(g) Chemistry 151, 152, 161.	
(h) Chemistry 181H, 182H, 185H.	
(3) Mathematics and Statistics: One of the following groups of courses (6 to 8 credits):	
(a) Lyman Briggs 118, 119.	
(b) Lyman Briggs 118; Statistics and Probability 231.	
(c) Mathematics 132, 133.	
(d) Mathematics 132; Statistics and Probability 231.	
(e) Mathematics 152H, 153H.	
(4) Physics: One of the following groups of courses (8 to 10 credits):	
(a) Lyman Briggs 273, 274.	
(b) Physics 231, 232, 251, 252.	
(c) Physics 183, 184, 191, 192.	
(d) Physics 183B, 184B, 191, 192.	
(e) Physics 191, 192, 193H, 294H.	
(5) History, Philosophy and Sociology of Science: A total of 11 or 12 credits from the courses in groups (a), (b), and (c) below.	
(a) One of the following courses: Lyman Briggs 133; Writing, Rhetoric and American Cultures 101.	
(b) One of the following courses: Lyman Briggs 321A, 322A, 323A, 324A, 325A, 326A, 327A.	
(c) One of the following courses: Lyman Briggs 321B, 322B, 323B, 324B, 325B, 326B, 327B.	
(6) Senior Seminar: Lyman Briggs 492 (4 credits).	
b. MAJOR or COORDINATE MAJOR.	
Each student must complete the requirements of a Major or a Coordinate Major. The Major or Coordinate Major must be chosen from the lists of options below. Both the Major or Coordinate Major <i>and</i> the related courses must be approved by the student's academic advisor. With the approval of the appropriate Lyman Briggs College Curriculum Coordinator or Undergraduate Director, courses other than those that are listed as requirements for a Major or Coordinate Major may be used to satisfy degree requirements.	
Majors:	
Biology	
Computer Science	

Earth Science
Environmental Science and Management
Physical Science
History, Philosophy and Sociology of Science
Coordinate Majors:

- College of Agriculture and Natural Resources:
 - Animal Science
 - Entomology
 - Fisheries and Wildlife
 - Food Science
- College of Engineering:
 - Computer Science

Students are admitted to this Coordinate Major after they have reached junior standing and have met certain other requirements specified by Lyman Briggs College.
- College of Natural Science:
 - Actuarial Science
 - Astrophysics
 - Biochemistry and Molecular Biology
 - Biochemistry/Biotechnology
 - Biological Science—Interdepartmental
 - Biomedical Laboratory Science
 - Chemical Physics
 - Chemistry
 - Computational Chemistry
 - Computational Mathematics
 - Earth Science—Interdepartmental
 - Environmental Biology/Microbiology
 - Environmental Biology/Plant Biology
 - Environmental Biology/Zoology
 - Environmental Geosciences
 - Genomics and Molecular Genetics
 - Geological Sciences
 - Human Biology
 - Mathematics
 - Mathematics, Advanced
 - Microbiology
 - Neuroscience
 - Nutritional Sciences
 - Physical Science—Interdepartmental
 - Physics
 - Physiology
 - Plant Biology
 - Statistics
 - Zoology

Majors

	CREDITS
1. Biology	41
a. A minimum of 41 credits from the courses listed below including:	
(1) Organic Chemistry (6 credits):	
Both of the following courses:	
CEM 251 Organic Chemistry I	3
CEM 252 Organic Chemistry II	3
(2) Biochemistry (4 to 6 credits):	
One of the following, either (a) or (b):	
(a) BMB 401 Comprehensive Biochemistry	4
(b) BMB 461 Advanced Biochemistry I	3
BMB 462 Advanced Biochemistry II	3
(3) Advanced Experiential Biology (6 credits):	
The following course:	
LB 348 Research Experiences in Biology	3
At least 3 credits from the following:	
LB 490B Advanced Directed Study – Biology	1 to 4
LB 493 Field Experience	1 to 4
LB 494 Undergraduate Research	1 to 4
Other courses as approved by advisor.	
(4) Integrative Biology (16 credits):	
All of the following courses:	
IBIO 341 Fundamental Genetics	4
IBIO 355 Ecology	3
IBIO 445 Evolution (W)	3
MMG 301 Introductory Microbiology	3
MMG 409 Eukaryotic Cell Biology	3
(5) Organismal Diversity (3 or 4 credits):	
One of the following courses:	
ENT 404 Fundamentals of Entomology	3
ENT 422 Aquatic Entomology	3
ENT 470 General Nematology	3
FW 471 Ichthyology	4
IBIO 306 Invertebrate Biology	4
IBIO 328 Comparative Anatomy and Biology of Vertebrates (W)	4
IBIO 360 Biology of Birds	4
IBIO 365 Biology of Mammals	4
IBIO 384 Biology of Amphibians and Reptiles (W)	4
PLB 402 Biology of Fungi	4
PLB 418 Plant Systematics	3
PLB 424 Algal Biology	4
Other courses as approved by advisor.	
(6) Ecology, Evolution, and Behavioral Biology (3 or 4 credits):	
One of the following courses:	

CSS 442	Agricultural Ecology	3	(a) LB 118	Calculus I	5
FW 417	Wetland Ecology and Management	3	STT 231	Statistics for Scientists	3
FW 420	Stream Ecology	3	(b) MTH 132	Calculus I	3
FW 431	Ecophysiology and Toxicology of Fishes	3	MTH 133	Calculus II	4
FW 439	Conservation Ethics	3	STT 231	Statistics for Scientists	3
FW 444	Conservation Biology	3	(2) One course from each of the following 7 areas		
FW 463	Wildlife Disease Ecology	3	(24 to 26 credits):		
FW 472	Limnology	3	(a) Ecology:		
GLG 434	Evolutionary Paleobiology	4	ZOL 355	Ecology	3
IBIO 303	Oceanography	4	ZOL 355L	Ecology Laboratory	1
IBIO 313	Animal Behavior	3	(b) Geology:		
IBIO 415	Ecological Aspects of Animal Behavior (W)	3	GLG 201	The Dynamic Earth	4
IBIO 440	Field Ecology and Evolution	4	(c) Taxonomy or Phylogenetic Biology:		
MMG 425	Microbial Ecology	3	ENT 404	Fundamentals of Entomology	4
PLB 441	Plant Ecology	3	PLB 418	Plant Systematics	3
PLB 443	Restoration Ecology	3	ZOL 306	Invertebrate Biology	4
(7) Cellular and Molecular Biology (3 or 4 credits):			(d) Biochemistry:		
One of the following courses:			BMB 401	Basic Biochemistry	4
FSC 440	Food Microbiology	3	(e) Aquatic Systems:		
IBIO 320	Developmental Biology	4	FW 420	Stream Ecology	3
IBIO 408	Histology	4	(f) Microbiology:		
IBIO 425	Cells and Development (W)	4	MMG 301	Introductory Microbiology	3
MMG 404	Human Genetics	3	(g) Economics:		
MMG 413	Virology	3	EC 201	Introduction to Microeconomics	3
MMG 421	Prokaryotic Cell Physiology	3	(3) One course from each of the following three groups		
MMG 425	Microbial Ecology	3	(9 to 11 credits):		
MMG 431	Microbial Genetics	3	(a) FOR 464	Forest Resource Economics (W)	3
MMG 433	Microbial Genomics	3	SOC 452	Environment and Society	3
MMG 445	Microbial Biotechnology (W)	3	(b) FW 424	Population Analysis and Management	4
MMG 451	Immunology	3	FW 444	Conservation Biology	3
MMG 461	Molecular Pathogenesis	3	(c) FW 410	Upland Ecosystem Management	3
MMG 463	Medical Microbiology	3	FW 417	Wetland Ecology and Management	3
PSL 310	Physiology for Pre-Health Professionals	4	Students who elect Sociology 452 must also complete Sociology 452L to meet requirement 4. a. (3) (a).		
PSL 431	Human Physiology I	4			
Other courses as approved by advisor.					
2. Computer Science		30	5. Physical Science		31
a. A minimum of 30 credits from the courses listed below including:			a. A minimum of 31 credits from the courses listed below including:		
(1) All of the following courses (24 credits):			(1) The following course:		
CSE 231	Introduction to Programming I	4	LB 220	Calculus III	4
CSE 260	Discrete Structures in Computer Science	4	(2) At least 27 credits in chemistry courses, in physics courses, or in chemistry and physics courses approved by the student's academic advisor. At least 20 of the 27 credits must be in courses at the 300 level or above, and at least 14 of the 27 credits must be in either chemistry courses or physics courses and must meet the conditions specified below:		
CSE 320	Computer Organization and Architecture	3	For students who elect to complete at least 14 credits in chemistry courses, at least 4 of the 14 credits must be laboratory credits at the 300–400 level.		
CSE 330	Algorithms and Data Structures	3	For students who elect to complete at least 14 credits in physics courses, at least 6 of the 14 credits must be in modern physics, and at least 3 of the 14 credits must be laboratory credits.		
CSE 410	Operating Systems	3			
CSE 460	Computability and Formal Language Theory	3	6. History, Philosophy and Sociology of Science		24
LB 220	Calculus III	4	a. A minimum of 24 credits in 300–400 level science and technology studies courses approved by the student's academic advisor. Courses in the Lyman Briggs College CORE PROGRAM and Lyman Briggs 492 may not be used to satisfy this requirement. Courses outside Lyman Briggs College may be used to satisfy this requirement.		
(2) At least two of the following courses (6 credits):					
CSE 420	Computer Architecture	3			
CSE 422	Computer Networks	3			
CSE 435	Software Engineering	3			
CSE 440	Introduction to Artificial Intelligence	3			
CSE 450	Translation of Programming Languages	3			
CSE 452	Organization of Programming Languages	3			
CSE 472	Computer Graphics	3			
CSE 480	Database Systems	3			
3. Earth Science		27			
a. A minimum of 27 credits from the courses listed below including:					
(1) At least 14 credits in courses at the 300–400 level.					
(2) At least 8 credits in earth science courses outside the Department of Earth and Environmental Sciences.					
(3) At least one course in each of the following 5 earth science areas (15 to 22 credits):					
(a) Astronomy and Astrophysics					
AST 207	The Science of Astronomy	3			
(b) Geology of the Solid Earth					
GLG 201	The Dynamic Earth	4			
GLG 321	Mineralogy and Geochemistry	4			
GLG 351	Structural Geology and Tectonics	4			
GLG 361	Petrology (W)	4			
GLG 401	Plate Tectonics (W)	4			
GLG 481	Reservoirs and Aquifers	3			
GLG 491	Field Geology – Summer Camp (W)	6			
(c) Paleobiology					
GLG 431	Sedimentology and Stratigraphy (W)	4			
GLG 433	Vertebrate Paleontology	4			
GLG 434	Evolutionary Paleobiology	4			
PLB 335	Plants Through Time	3			
(d) Environmental Geosciences and Meteorology					
GEO 203	Introduction to Meteorology	3			
GEO 401	Geography of Plants of North America	3			
GEO 402	Agricultural Climatology	3			
GEO 405	Weather Analysis and Forecasting	4			
GLG 421	Environmental Geochemistry	4			
(e) Geomorphology					
CSS 470	Soil Resources	3			
GEO 407	Regional Geomorphology of the United States	3			
GEO 408	Soil Geomorphology Field Study	4			
Geography 206 and 206L, combined, may be substituted for one of the courses listed above.					
4. Environmental Sciences and Management		41			
a. A minimum of 41 credits from the courses listed below including:					
(1) One of the following groups of courses (8 or 10 credits):					

MINOR IN BIOETHICS

The Minor in Bioethics, which is administered by Lyman Briggs College, is available as an elective to students who are enrolled in bachelor's degree programs at Michigan State University. The minor is designed to prepare students to engage with the evolving set of ethical issues in biomedicine that they will encounter in their careers or their daily lives. The minor's interdisciplinary character fosters students' abilities to understand and question health care systems from a wide variety of intellectual viewpoints. Such interdisciplinary study also promotes communication across disciplinary boundaries.

Students wishing to pursue careers in health-related fields may find the minor particularly appealing. In addition, students pursuing academic programs outside health-related fields often find that the minor complements their major. With the approval of the department and college that administer the student's degree program, the courses that are used to satisfy the requirements for the minor may also be used to satisfy the requirements for the bachelor's degree.

Requirements for the Minor in Bioethics

		CREDITS
1. Both of the following courses (3 credits):		
LB 240	Bioethics: Theories and Methods	2
LB 440	Bioethics Capstone	1
2. Complete 15 credits from at least four courses. No more than 8 credits may be from the same discipline. Students should work with the advisor for appropriate substitution requests.		
ANP 270	Women and Health: Anthropological and International Perspectives	3
ANP 370	Culture, Health, and Illness	3
ANP 423	Psychological Anthropology	3
ANP 425	Issues in Medical Anthropology	3
ANP 471	The Anthropology of Alternative Medicine	3
ANS 427	Environmental Toxicology and Society	3
CEP 470	Disability in a Diverse Society	3
EC 498	Economics of Health Care (W)	3
ENG 473A	Literature and Medicine	3
EPI 390	Disease in Society: An Introduction to Epidemiology and Public Health	4
GEO 435	Geography of Health and Disease	3
HNF 375	Community Nutrition	3
HNF 406	Global Foods and Culture	3
HST 420	History of Sexuality since 18th Century	3
HST 425	American and European Health Care since 1800	4
KIN 445	Sport and Physical Activity in Society (W)	3
LB 324A	Science and Sex, Gender, Sexuality – Arts and Humanities (W)	4
LB 324B	Science and Sex, Gender, Sexuality – Social Sciences (W)	4
LB 326A	Medicine and Health – Arts and Humanities (W)	4
LB 326B	Medicine and Health – Social Sciences (W)	4
LB 355	Philosophy of Technology (W)	4
MC 351	Science and Social Policy	4
PHL 344	Ethical Issues in Health Care	4
PHL 380	Nature of Science	3
PHL 444	Philosophical Issues in Biomedicine	4
PHL 480	Philosophy of Science	4
PHL 485	Philosophy of Social Science	3
PSY 280	Abnormal Psychology	3
PSY 320	Health Psychology	3
REL 385	Religion, Health, and Healthcare	3
SOC 368	Science, Technology and Society	4
SOC 451	Dynamics of Population	3
SOC 475	Health and Society	3
SW 472	Social Work in Health Care	3
WS 304	Lesbian, Gay, Bisexual, Transgender, Queer (LBGTQ) and Sexuality Studies	3

MINOR IN HISTORY, PHILOSOPHY AND SOCIOLOGY OF SCIENCE

The Minor in History, Philosophy and Sociology of Science, which is administered by Lyman Briggs College, is designed to increase students understanding of the epistemological foundations and ethical elements of science while learning more of the history of some areas of science and appreciating the complex ways that science is connected to other social institutions and practices.

The minor is available as an elective to students who are enrolled in a bachelor's degree program in Lyman Briggs College at Michigan State University. Students majoring in History, Philosophy and Sociology of Science in Lyman Briggs College are not eligible for the minor. With the approval of the college, the courses that are used to satisfy the minor may also be used to satisfy the requirements for the bachelor's degree.

Students who plan to complete the requirements for the minor should consult an undergraduate advisor in Lyman Briggs College.

Requirements for the Minor in History, Philosophy and Sociology of Science

		CREDITS
Complete 15 to 16 credits from the following:		
1. Two of the following courses (8 credits):		
LB 330	Topics in History, Philosophy, and Sociology of Science (W)	4
LB 331	Literature and Science (W)	4
LB 332	Technology and Culture (W)	4
LB 333	Topics in History of Science (W)	4
LB 334	Science, Technology, and Public Policy (W)	4
LB 335	The Natural Environment: Perceptions and Practices (W)	4

LB 336	Gender, Sexuality, Science, Technology (W)	4
LB 355	Philosophy of Technology (W)	4
LB 490E	Advanced Directed Study in History, Philosophy, and Sociology of Science (W)	4
2. Two of the following courses (7 or 8 credits):		
ENG 473A	Literature and Medicine	3
ESA 430	Environmental and Natural Resource Law	3
ESA 440	Environmental and Natural Resource Policy in Michigan	3
GEO 435	Geography of Health and Disease	3
HST 416	History of the Atomic Bomb and Nuclear Culture	3
HST 420	History of Sexuality since the 18th Century	3
HST 425	American and European Health Care since 1800	4
HRT 486	Biotechnology in Agriculture: Applications and Ethical Issues	3
LB 330	Topics in History, Philosophy, and Sociology of Science (W)	4
LB 331	Literature and Science (W)	4
LB 332	Technology and Culture (W)	4
LB 333	Topics in History of Science (W)	4
LB 334	Science, Technology, and Public Policy (W)	4
LB 335	The Natural Environment: Perceptions and Practices (W)	4
LB 336	Gender, Sexuality, Science, Technology (W)	4
LB 355	Philosophy of Technology (W)	4
LB 490E	Advanced Directed Study in History, Philosophy, and Sociology of Science (W)	4
MC 350	Evolution and Society	4
MC 351	Science and Social Policy	4
MC 459	Science, Technology, Environment and Public Policy Capstone (N)	3
PHL 380	Nature of Science	3
PHL 462	Philosophy of Mind	3
PHL 480	Philosophy of Science	4
PHL 484	Philosophy of Biological Science	3
PHL 485	Philosophy of Social Science	3
SOC 368	Science, Technology, and Society	3
SOC 452	Environment and Society	3
SOC 452L	Internship in Environment and Society	1
SOC 475	Sociology of Health Care Systems	3
SOC 476	Social Psychology of Health	3
ZOL 446	Environmental Issues and Public Policy	3

Courses used to fulfill requirement 1. above may not be used to fulfill this requirement. Other courses may be used in fulfillment of this requirement with the approval of the student's academic advisor.

LYMAN BRIGGS COLLEGE 3 + 4 OPTION

Lyman Briggs College, in collaboration with the MSU College of Osteopathic Medicine, offers an opportunity for selected Lyman Briggs College students to earn a baccalaureate degree after satisfactory completion of a minimum of 90 credits at Michigan State University and a minimum of 30 credits through subsequent enrollment at the Michigan State University College of Osteopathic Medicine. Only students who matriculate as first-year students at Lyman Briggs College may pursue this option. Students interested in this option should consult with their college academic advisor during their first year in the college.

Admission to the MSU College of Osteopathic Medicine component of this program is limited to a small number of students who complete the specified university and college requirements and who fulfill admission requirements for the MSU College of Osteopathic Medicine Doctor of Osteopathic Medicine program.

All students in this program will complete a minimum of 90 credits at Michigan State University in the Lyman Briggs College Biology major. The requirements for the program are as follows:

1. Completion of all the Michigan State University graduation requirements, including integrative studies and general education.
2. Completion of the Lyman Briggs College graduation requirements including mathematics, chemistry, biology, physics, and history, philosophy and sociology of science.
3. Be pursuing the curriculum for the Lyman Briggs College Biology major.
4. Completion of a minimum of 30 credits at the MSU College of Osteopathic Medicine in the preclerkship component of the Doctor of Osteopathic Medicine degree program.

Upon satisfactory completion of the specified 120 credits, students in this program will be eligible for the Bachelor of Science degree in Lyman Briggs College with a major in Biology.